

Annex 1: Country fiches

1.1 Financial, economic and social costs of floods

Austria				Between 2002 and 2013, for the 8 floods recorded the total direct costs were €5,300 million (damages available for 7 out of 8 floods, damages extrapolated across all 8 floods). The average cost per flood was €660 million (based just on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€3,100 ⁽¹⁾	9 ⁽⁷⁾	No data	More than 10,000 homes were damaged ⁽⁹⁾
2005	€592 ⁽²⁾	4 ⁽⁷⁾	No data	Approximately 450 people evacuated ⁽¹⁰⁾
2006	€72 ⁽³⁾		No data	About 500 people evacuated from Dürnkrut region, 460 homes heavily affected or destroyed ⁽³⁾
2009	€14 ⁽⁴⁾	1 ⁽⁷⁾	No data	Hundreds of houses uninhabitable, thousands badly damaged ⁽¹¹⁾ Many storks killed in storm ⁽¹²⁾
2012	€10 ⁽⁵⁾	1 ⁽⁸⁾	No data	3 months after the floods, 16 businesses still unable to resume full operations ⁽⁵⁾
2013	€866 ⁽⁶⁾	4 ⁽⁷⁾	No data	200 people affected ⁽⁷⁾ 160 passengers in Salzburg were put up overnight in army barracks after floods stranded their train ⁽¹³⁾
References and sources of information: ¹ Republic of Austria (2002); ² Bundesministerium für Inneres (2005); ³ ICPDR (2008); ⁴ Chapman L (2009); ⁵ Bundesministerium für Inneres (2012); ⁶ Austrian Federal Ministry of the Interior (2013); ⁷ CRED (nd); ⁸ Austrian Times (2012); ⁹ ICPDR (nd); ¹⁰ Pfurtscheller C & Schwarze R (2008); ¹¹ Austrian Times (2009); ¹² Austrian Times (2009a); ¹³ DFO (nd)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, €170.7 million was received from the EU Solidarity Fund. Total direct damages were €4,368 million. 4 applications were accepted and 0 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2002	€2,900	€134	Major flooding	
2005	€592	€15	Regional flooding (Tyrol/Vorarlberg)	
2012	€9.6	€0.2	Floods (neighbouring country)	
2013	€866	€22	Floods (neighbouring country)	
References: InfoREGIO (2013); European Commission (2012)				

Austria				Between 2002 and 2013, for the 8 floods recorded the total direct costs were €5,300 million (damages available for 7 out of 8 floods, damages extrapolated across all 8 floods). The average cost per flood was €660 million (based just on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Investments made				Between 2002 and 2011, €1,958 million was invested in flood risk management measures, equivalent to €218 million per year on average. €100 million was from EU funds (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:		
2002	€147 ⁽¹⁾	No data	No data	Overall expenses of the Federal Water Engineering Administration (Bundeswasserbauverwaltung – BWV), Forest Engineering Service on Torrent and Avalanche Control (Wildbach- und Lawinerverbauung – WLW) and the Federal Ministry for Transport, Innovation and Technology (Bundesministerium für Verkehr, Innovation und Technologie – bmvit) for protection against natural disasters		
2003	€174 ⁽¹⁾	No data	No data			
2004	€139 ⁽¹⁾	No data	No data			
2005	€152 ⁽¹⁾	No data	No data			
2006	€200 ⁽¹⁾	No data	No data			
2007	€185 ⁽¹⁾	No data	No data			
2008	€206 ⁽¹⁾	No data	No data			
2009	€230 ⁽¹⁾	No data	No data			
2010	€206 ⁽¹⁾	No data	No data			
2011	€219 ⁽¹⁾	No data	No data			
2007-2013	-	€100 ⁽²⁾	Cohesion Policy	Measures for protecting the environment, combating the effects of climate change and promoting the use of renewable energies and energy efficiency. Limited/no data on specific allocation from other funds		
References: ¹ Lebensministerium (2012); ² European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	1,840km (5% of total river length) ⁽¹⁾	No data	19,000 buildings (8% of total) ⁽²⁾ 242,000 buildings (12% of total) ⁽²⁾	No data	1:30 (high risk) ⁽²⁾ 1:200 (if defences failed) ⁽²⁾	2005 ⁽²⁾
Future risk	No data	No data	No data	No data	No data	No data
References: ¹ ICPDR (2012) (relates to Austrian part of Danube only); ² Sinabell & Url (2008)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Funding/general contributions	€122 million in total, of which €69 million was from the federal government ⁽¹⁾ . Typically, federal funds are around 60% ⁽²⁾	Almost €100 million through Cohesion Policy 2007-2013* ⁽³⁾ €36 million from LIFE Environment ⁽⁴⁾	Cohesion Policy LIFE Environment Policy and Governance ⁽⁴⁾	Federal provinces: 23% Stakeholder contributions: 17% ⁽²⁾		
Restoration of the Danube alluvial floodplain and riverbanks	€4.6 million ⁽⁵⁾	€2.1 million ⁽⁵⁾	LIFE (1998-2003; 2002-2006) ⁽⁴⁾	Federal Ministry of Agriculture, Forestry, Environment and Water Management		

Austria		Between 2002 and 2013, for the 8 floods recorded the total direct costs were €5,300 million (damages available for 7 out of 8 floods, damages extrapolated across all 8 floods). The average cost per flood was €660 million (based just on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
References: ¹ SCCV (2011); ² Hornich (2008); ³ European Commission (nd); ⁴ European Commission (2012a); ⁵ Mohl (nd)					
Assumptions and caveats: * Across priorities for protecting the environment, combatting the effects of climate change and promoting use of renewable energy and energy efficiency ⁽⁴⁾					
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits
Restoration of the Danube alluvial floodplain and riverbanks	Donau-Auen National Park ⁽¹⁾	No data	No data	No data	Reconnection of river to floodplain; improvement to waterway navigation ⁽²⁾
References: ¹ Mohl (nd); ² Natura2000exchange.eu (nd)					
Project	Grey	Green	Soft	Planned or delivered	
Restoration of the Danube alluvial floodplain and riverbanks	None reported	Reconnection of side channels by removing dams and weirs Removal of 3km of hard river bank enforcement ⁽¹⁾	None reported	Delivered	
References: ¹ Natura2000exchange.eu (nd)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Restoration of the Danube alluvial floodplain and riverbanks	Restoration of wetlands that had been drying up ⁽¹⁾	Restoration of natural dynamics to Danube floodplain ⁽¹⁾			Allows river to erode river banks, reducing energy ⁽¹⁾
References: ¹ Natura2000exchange.eu (nd)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
4	9
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
'Klima- und Energiefonds' (KLIEN)									x							
'Umweltförderung im Inland'									x							
Ecobusiness				x				x						x	x	
Energieförderkompass				x												
Exportinitiative Umwelttechnologien							x									
Ökobusinessplan Wien			x									x		x	x	
Ökologische Betriebsberatung														x	x	
Ökomanagement				x				x						x	x	
ÖKOPROFIT				x						x		x		x		
The telephone service from the Umwelt Service Salzburg																
Umwelt Service Salzburg				x				x						x	x	
Waiver of administration fees	x															
Zukunft Innovation				x				x						(x)		
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total SMEs: All sectors (NACE R.2 B-J, L,M,N)	308,513	
SMEs taking actions to improve resource efficiency		
	AT	EU 28
Measures to save energy	80%	67%
Measures to minimise waste	75%	67%
Measures to save water	56%	51%
Measures to save materials	63%	59%
Many measures	45%	35%
No measures	5%	6%
Comprehensive systems for energy efficiency	5%	4.26%
Benefitting from public support for measures	11%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	9,709	17,339	23,640	12,487
Energy savings (kwh/year)	425,444	480,328	15,916	268,869
CO2 savings (tonnes/year)	325	193	6	95
Savings in waste (tonnes/year)	35	127	7,471	832
Savings in raw materials (tonnes/year)	66	21,395	513	894
Savings in water (m ³ /year)	53	1,232	11	38

Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses> accessed on 31 January 2014

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2009		Change between 2008 and 2009 (%)	
	Public	Private	Public	Private
Total	1,643	1,983	-0.59%	-10%
Breakdown by category				
Protection of ambient air and climate	244	466	118%	2%
Wastewater management	474	238	-20.2%	-21%
Waste management	468	276	-2.3%	8.6%
Protection and remediation of soil, groundwater and surface water	32.8	453	77%	3%
Noise and vibration abatement	7.5	50	-65.4%	14%
Protection of biodiversity and landscapes	231	479	24.9%	3.6%
Protection against radiation	Unknown	Unknown	Unknown	Unknown
Research and development for environmental protection	Unknown	Unknown	Unknown	Unknown
Other environmental protection activities	186	21	-23%	-18%

Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.

Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O)

Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not

Environmental expenditure for latest year for which data are available (€ million)		
included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable		
Category	2009	EU average for 2009
Public environmental expenditure as percentage of total public expenditure	1.13%	1.44%
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014	
Total environmental expenditure as percentage of GDP	2009 3.88%	EU average for 2009 2.34%
	Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014); Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014	

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2009 170	EU total for 2009 3,849
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Eco-Innovation fund⁽¹⁾; INTERREG IVC⁽²⁾; Life+⁽³⁾; European funds (ERDF, CF & IPA)⁽⁴⁾; The European Fisheries Fund⁽⁵⁾; The European Agricultural Fund for Rural Development⁽⁶⁾</p> <p>Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-projects.eu/eco/page/Page.jsp on 1 December 2013. ² INTERREG IVC (nd): Approved Projects Database, accessed at: http://www.interreg4c.eu/projects/ on 29 November 2013. ³ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ⁴ European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ⁵ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁶ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

1.4 References

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1.1 Financial, economic and social costs of floods

BELGIUM				Between 2002 and 2013 for the 10 floods recorded the total direct costs were €1,800 million (damages only found for 1 out of 10 floods, damages extrapolated across all 10 floods). The average cost per flood was €180 million (based just on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€ million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	N/Q	2 ⁽¹⁾	No data	More than 200 houses flooded ⁽²⁾ and 2,400 people affected ⁽¹⁾
2003	N/Q	No data	No data	Hundreds of homes flooded, dozen of villages around the Meuse River cut off ⁽³⁾
2004	N/Q	No data	No data	
2005	N/Q	No data	No data	210 people affected ⁽¹⁾
2007	N/Q	No data	No data	
2010	€180 ⁽¹⁾	3 ^(1,4)	No data	More than 200 homes had to be evacuated. A pharmaceutical factory closed, a hospital was evacuated and many roads became unstable ⁽⁵⁾
2011	N/Q	No data	No data	
References and sources of information: ¹ CRED (nd); ² WWF (2004); ³ Heatisonline (2003); ⁴ DFO (nd); ⁵ euronews.com (2010)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; costs have not been normalised				
EU Solidarity fund				No applications
Year	Total direct damage	Funds received	Reason(s) for application	Assumptions and caveats:
No applications				
References: Inforegio (2013); European Commission (2012)				
Investments made				Between 2002 and 2013, €488 million was invested in flood risk management measures, equivalent to €44 million per year on average (this does not include the estimated €18 million per year spent on coastal maintenance). €38 million was from EU funds (2007 - 2013) (but not all of this total may have been used for flood risk management)
Year	Investments made (€ million)	EU funds received (€million)	EU funds	Assumptions and caveats: Annual investments are unknown however the cost of investments in a number of projects (over a number of years) have been identified and provided below
1998-2015	€419 ⁽¹⁾	No data	No data	Total expenditure for coastal protection and climate adaptation ⁽¹⁾
1997-2005	€30 ⁽¹⁾	No data	No data	Cost of SIGMA Plan, plus €49 million cost of supporting measures ⁽¹⁾
1998-2008	€130	No data	No data	Investment in storm basins and collection systems in Brussels capital region ⁽²⁾

BELGIUM				Between 2002 and 2013 for the 10 floods recorded the total direct costs were €1,800 million (damages only found for 1 out of 10 floods, damages extrapolated across all 10 floods). The average cost per flood was €180 million (based just on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
2008	€1.3 ⁽¹⁾	No data	No data	Indirect expenditure to protect against coastal flooding and erosion ⁽¹⁾		
Not specified	€18 per year ⁽¹⁾	No data	No data	Annual cost of coastal maintenance ⁽¹⁾		
2007-2013	-	€38 ⁽³⁾	Cohesion Fund	Protecting the environment, promoting sustainable growth and fighting climate change ⁽³⁾ . Limited/no data on specific allocation from other funds		
References: ¹ Policy Research Corporation (2009); ² Région de Bruxelles-Capitale (2008); ³ European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	Brussels capital region	No data	2,857 insurance claims in 2005 ⁽¹⁾	Urban floods largely caused by heavy rainfall in summer with average occurrence of 1.5 floods per year ⁽²⁾ €2.4 million damages caused in 2005 ⁽¹⁾	No data	No data
	Flanders	400,000 people (4% of the total population) live along the Belgian coast. This increases by 300,000 tourists during the summer ⁽³⁾	No data	No data	Not specified ⁽³⁾	Not specified ⁽³⁾
	Walloon	No data	No data	€331 million (Meuse) ⁽⁴⁾ €1.935 million (Meuse) ⁽⁴⁾	1:100 ⁽⁴⁾ 1:100+30% ⁽⁴⁾	2009 ⁽⁴⁾
Future risk	Brussels capital region	No data	No data	Blue network established in 1999 to restore rivers and waterbodies, with benefit for flood risk (against background of increasing damages) ⁽¹⁾	No data	No data
	Flanders	No data	No data	No data	No data	No data
	Walloon	No data	No data	Estimated damages under 'dry' scenario of €334 to €462 million (increase of		2100 ⁽⁴⁾

BELGIUM		Between 2002 and 2013 for the 10 floods recorded the total direct costs were €1,800 million (damages only found for 1 out of 10 floods, damages extrapolated across all 10 floods). The average cost per flood was €180 million (based just on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
				1% to 40%, depending on urbanisation scenario) Estimated damages under 'wet scenario' of €2.124 to €2.408 billion (increase of 540% to 630%, again depending on urbanisation scenario) ⁽⁴⁾	
References: ¹ LNE (2008); ² Mees D (2013); ³ Kellens W et al (2009); ⁴ Beckers A et al (2013);					
Case study examples: costs and benefits of projects					
Project	Investment made	EU funds	Funding source	Other sources	
SIGMA Plan II (includes a list of over 50 projects to manage flood protection and nature restoration of the Scheldt Estuary)	€521 million (2006-2030)* all of which was from the Flemish Government	None	Flemish Government	None	
References: De Nocker L & Mazza L (nd)					
Assumptions and caveats: * Actual expenditure will differ from planned expenditure, however this information provides an initial estimate of investment					
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits
SIGMA Plan II	A large part of Flanders along the Scheldt and its tributaries the Durme, the Rupel, the Nete, the Kleine Nete, the Grote Nete, the Dijle and the Senne. 200km of watercourses in Belgium	Expected flood protection benefits relating to avoided material damages to houses, infrastructure and economic sectors €740 million.	Expected recreational benefits €22 million	Social Cost Benefit Analysis (SCBA) concluded that benefits outweigh the costs	Planned to contribute significantly to the conservation objectives of the Scheldt
References: De Nocker L & Mazza L (nd)					

BELGIUM		Between 2002 and 2013 for the 10 floods recorded the total direct costs were €1,800 million (damages only found for 1 out of 10 floods, damages extrapolated across all 10 floods). The average cost per flood was €180 million (based just on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
Assumptions and caveats: * actual benefits may differ from planned benefits, however this information provides an initial estimate of investment					
Project	Grey	Green	Soft	Planned or delivered	
SIGMA Plan II	None reported	The creation of estuarine nature with muds and marshes and the creation of wetlands; dike realignment	None reported	Some planned, some delivered as the projects are ongoing until 2030	
References: De Nocker L & Mazza L (nd)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
SIGMA Plan II	Creation of estuarine nature with muds and marshes and the creation of wetlands	Expected avoided costs in relation to reducing nutrient emissions provided by ecosystem benefits € 130 million	None reported	None reported	None reported
References: De Nocker L & Mazza L (nd)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
10	9
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
4th Environmental Policy Plan (MINA-4) [Milieubeleidsplan 2011-2015]				x				x							x	
Eco-Efficiëntiescan				x										x	x	
Ecotoolkit					x	x										
Energy Scan (energy audit)			x													
FIRD									x							
GOM-Milieucellen																
Flemish Energy Agency				x		x		x						x		
Marshall Plan 2.Green	x			x					x	x		x			x	
Material Scan (material audit)			x													
Network of 'facilitators'														x		
SME Portfolio [KMO portfolio]									x							
Subsidy Database				x												
Sustainable Innovation Sytem (SIS) Toolkit					x											
SYMBIOSIS												x				
TETRA				x				x	x			x				
The Energy Fund									x							
The Environment Consultants UWE			x	x			x					x		x		
The Green Technologies Business Unit				x					x							
Winwinlening [Win win loan]	x								x							
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	526,234	
SMEs taking actions to improve resource efficiency		
	BE	EU28
Measures to save energy	68%	67%
Measures to minimise waste	79%	67%
Measures to save water	59%	51%
Measures to save materials	62%	59%
Many measures	36%	35%
No measures	2%	6%
Comprehensive systems for energy efficiency	4%	4.26%*
Benefitting from public support for measures	14%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	12,630	22,556	30,754	16,244
Energy savings (kwh/year)	519,501	586,519	19,434	328,311
CO2 savings (tonnes/year)	397	236	8	116
Savings in waste (tonnes/year)	32	114	6,738	751
Savings in raw materials (tonnes/year)	86	27832	668	1,163
Savings in waste (m ³ /year)	38	881	8	28
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2010		Change between 2008 and 2010	
	Public	Private	Public	Private
Total	1,566	Unavailable	-2.20%	Unavailable
Breakdown by category				
Protection of ambient air and climate	38.8	Unavailable	25.6%	Unavailable
Wastewater management	34.4	Unavailable	-62.5%	Unavailable
Waste management	875	Unavailable	4%	Unavailable
Protection and remediation of soil, groundwater and surface water	88	Unavailable	-0.3%	Unavailable
Noise and vibration abatement	unavailable	Unavailable	unavailable	Unavailable
Protection of biodiversity and landscapes	115	Unavailable	-1.2%	Unavailable

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2010		Change between 2008 and 2010	
	Public	Private	Public	Private⁽²⁾
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	415	Unavailable	4.2%	Unavailable
<p>Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.</p> <p>Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).</p> <p>Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable</p>				
Category	2010		EU average for 2010	
Public environmental expenditure as percentage of total public expenditure	0.84%		1.38%	
	<p>Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014</p>			
Total environmental expenditure as percentage of GDP	2010		EU average for 2010	
	Unavailable		2.30%	
	-		<p>Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)</p>	

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2010	EU total for 2010
		No Eurostat data
Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014.		
Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets		

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Eco-Innovation fund⁽¹⁾; INTERREG IVC⁽²⁾; Life+⁽³⁾; European funds (ERDF, CF & IPA)⁽⁴⁾; The European Fisheries Fund⁽⁵⁾; The European Agricultural Fund for Rural Development⁽⁶⁾</p> <p>Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-projects.eu/eco/page/Page.jsp on 1 December 2013. ² INTERREG IVC (nd): Approved Projects Database, accessed at: http://www.interreg4c.eu/projects/ on 29 November 2013. ³ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ⁴ European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ⁵ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁶ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

BULGARIA				Between 2002 and 2013, for the 15 floods recorded the total direct costs were €1,400 million (damages found for 5 out of 15 floods, damages extrapolated across all 15 floods). The average cost per flood was €96 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€1.1 ⁽¹⁾	1 ⁽¹⁾	No data	200 buildings flooded, 20 displaced, 800 inhabitants isolated ⁽²⁾
2005	€436 ⁽³⁾	39 ⁽¹⁾	No data	Over 14,000 buildings, including private homes, affected ⁽³⁾
2006	N/Q	No data	No data	Over 2,000 people evacuated ⁽⁴⁾
2007	N/Q	12 ⁽¹⁾	10 ⁽¹⁾	A total of 26 houses were demolished after the floods ⁽⁵⁾
2010	N/Q	No data	No data	Dozens of homes uninhabitable in Evros ⁽²⁾
2012	€44 ⁽⁵⁾	10 ⁽¹⁾	No data	Almost 38,000 people affected ⁽¹⁾
References and sources of information: ¹ CRED (nd); ² DFO (nd); ³ Bulgarian Government (2005); ⁴ ICPDR (2008); ⁵ Sofia Echo (2007)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, €20 million was received from the EU Solidarity Fund. Total direct damages were €459 million. 2 applications were accepted and 0 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2005	€222	€9.7	Major flooding	
	€237	€11	Major flooding	
References: Inforegio (2013); European Commission (2012)				
Investments made				Between 2002 and 2013, €2,812 million was invested in flood risk management measures, equivalent to €256 million per year on average. €2.8 billion was from EU funds (but not all of this total may have been used for flood risk management)
Year	Investments made (€million)	EU funds received (€million)	EU funds	
1998 – 2015	€18	-	-	Maximum investment made for protection against coastal flooding and erosion ⁽¹⁾
2007 – 2013	None specified	None specified	None specified	Operational programme covering environment does not mention projects to protect the coast against flooding, erosion or landslides ⁽¹⁾

BULGARIA				Between 2002 and 2013, for the 15 floods recorded the total direct costs were €1,400 million (damages found for 5 out of 15 floods, damages extrapolated across all 15 floods). The average cost per flood was €96 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
2007-2013	-	€2,800	Cohesion Fund	Support environmental, risk prevention and energy projects ⁽²⁾ . Limited/no data on specific allocation from other funds		
References: ¹ Policy Research Corporation (2009); ² European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	Areas of APSFR in process of being identified ⁽¹⁾					
Future risk	Coastal flooding less severe due to altitude of 70% of the Bulgarian coastal zone ⁽²⁾					
References: ¹ ICPDR (2012); ² Policy Research Corporation (2009)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Water Management and Flood Protection in Trakiets Village, Haskovo Municipality (WMFP)	€598,000	None reported	Municipality of Haskovo (€540,000), Regional Ecological Association "Maritza 2004" – Bulgaria (€11,000) and Municipality of Orestiada - Greece (€28,000)	None reported		
References: European Territorial Cooperation Programme – Greece-Bulgaria 2007-2013 (nd)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
Water Management and Flood Protection in Trakiets Village, Haskovo Municipality (WMFP)	Trakiets Village, Haskovo (Bulgaria)	No data	No data	No data	Improved flood protection and water management (including trans-border water management (between Bulgaria and Greece) as required according to the EU Water Framework Directive) ⁽¹⁾⁽²⁾	
References: ¹ European Territorial Cooperation Programme – Greece-Bulgaria 2007-2013 (nd); ² Keep (nd)						
Project	Grey	Green	Soft	Planned or delivered		
Water Management and Flood Protection in Trakiets Village, Haskovo Municipality (WMFP)	Correction of Olu Dere river bed and construction of protective dike ⁽¹⁾	Afforestation ⁽¹⁾	Undertake experience exchange visits (between Bulgaria and Greece) and planning of future	Delivered		

BULGARIA		Between 2002 and 2013, for the 15 floods recorded the total direct costs were €1,400 million (damages found for 5 out of 15 floods, damages extrapolated across all 15 floods). The average cost per flood was €96 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
				joint water management initiatives ^{(1),(2)}	
References: ¹ Keep (nd); ² European Territorial Cooperation Programme – Greece-Bulgaria 2007-2013 (nd)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Water Management and Flood Protection in Trakiets Village, Haskovo Municipality (WMFP)	Afforestation activities will lead to habitat creation and likely enhancement of local biodiversity. Also flood protection measures should help prevent environmental damage ^{(1),(2)}	None reported	Afforestation is likely to increase soil stability	None reported	None reported
References: ¹ European Territorial Cooperation Programme – Greece-Bulgaria 2007-2013 (nd); ² Keep (nd)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
2	-
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Ecotoolkit					x	x										
National Strategy for SME's development (2007-2013)									x							
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	288,220	
SMEs taking actions to improve resource efficiency		
	BG	EU28
Measures to save energy	41%	67%
Measures to minimise waste	27%	67%
Measures to save water	31%	51%
Measures to save materials	38%	59%
Many measures	9%	35%
No measures	11%	6%
Comprehensive systems for energy efficiency	4%	4.26%
Benefitting from public support for measures	2%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	4,080	7,286	9,934	5,247
Energy savings (kwh/year)	331,309	374,049	12,394	209,379
CO2 savings (tonnes/year)	253	151	5	74
Savings in waste (tonnes/year)	NA	NA	NA	NA
Savings in raw materials (tonnes/year)	28	8,990	216	376
Savings in water (m ³ /year)	3	72	1	2
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	231.41	296.66	10.66%	-31.70%
Breakdown by category				
Protection of ambient air and climate	0.35	118.09	150.00%	-42.88%
Wastewater management	69.78	39.13	-18.21%	-56.58%
Waste management	145.93	88.36	47.03%	17.77%
Protection and remediation of soil, groundwater and surface water	5.77	11.38	-56.88%	-22.80%
Noise and vibration abatement	0.08	0.02	Unavailable	-75.00%
Protection of biodiversity and landscapes	0.44	0.25	-67.88%	127.27%
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	9.07	39.43	-6.01%	-17.13%
<p>Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.</p> <p>Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).</p> <p>Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable</p>				
Category	2011		EU average for 2011	
Public environmental expenditure as percentage of total public expenditure	1.69%		1.34%	
	<p>Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014</p>			

Environmental expenditure for latest year for which data are available (€ million)		
Total environmental expenditure as percentage of GDP	2011	EU average for 2011
	1.91%	2.26%
	Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014	Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2011	EU total for 2011
	26.7	4,194
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Life+⁽¹⁾; European funds (ERDF, CF & IPA)⁽²⁾; The European Fisheries Fund⁽³⁾; The European Agricultural Fund for Rural Development⁽⁴⁾</p> <p>¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014.</p> <p>² European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ³ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁴ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

CROATIA				Between 2002 and 2013, for the 6 floods recorded the total direct costs were €480 million (damages only available for 3 out of 6 floods, damages extrapolated across all 6 floods). The average cost per flood was €80 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)		
2005	N/Q	No data	No data	250 people affected ⁽⁵⁾		
2006	€1.2 ⁽¹⁾	No data	No data	238 buildings flooded ⁽⁶⁾		
2010	€200 ^(2,3)	No data	No data	1,110 people affected ⁽⁵⁾		
2012	€38 ⁽⁴⁾	No data	No data	1,500 people affected ⁽⁵⁾		
References and sources of information: ¹ ICPDR (2008); ² Ministry of Regional Development, Forestry and Water Management (2010); ³ European Commission (2011); ⁴ Ministry of Agriculture for the Republic of Croatia (2012); ⁵ CRED (nd); ⁶ Croatian Bureau of Statistics 2007						
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised						
EU Solidarity fund				Between 2002 and 2013, €5.2 million was found received from the EU Solidarity Fund. Total direct damages were €212 million. 3 applications were accepted and 0 rejected		
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund		
2010	€200	€4.9	Floods (neighbouring country)	2 applications submitted and accepted in this year		
2012	€12	€0.3	Floods (neighbouring country)			
References: Inforegio (2013); European Commission (2012)						
Investments made				No data has been found on investments between 2002 and 2013		
Year	Investments made (€million)	EU funds received (€million)	EU funds			
No data						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	15% of the country at risk of river flooding ^(1,2)	87,000 residents at risk from river	57 settlements at risk of river	No data	No data	Not specified

CROATIA			Between 2002 and 2013, for the 6 floods recorded the total direct costs were €480 million (damages only available for 3 out of 6 floods, damages extrapolated across all 6 floods). The average cost per flood was €80 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
		flooding ^(1,2)	flooding ^(1,2)			
Future risk	No data	No data	No data	No data	No data	No data found
References: ¹ UNDP & WMO (2013); ² EU & UNDP (2013)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds		Funding source	Other sources	
Reconstruction project for Eastern Slavonia, Baranja and Western Srijem ⁽¹⁾	€54.6 million, of which €25.3 million for flood control and drainage, €15.5 million for wastewater management, €11.3 million for clearing of landmines and €2.5 million for nature protection ⁽¹⁾	None		World Bank €32.7 million ⁽¹⁾ (exchange rate 0.8048 (2005)) ⁽²⁾	Republic of Croatia (RoC) ⁽¹⁾	
References: ¹ World Bank (2005); ² European Central Bank (ECB) (nd)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
Reconstruction project for Eastern Slavonia, Baranja and Western Srijem ⁽¹⁾	Eastern Slavonia, Baranja and Western Srijem	No data	Net Present Value of the project US\$17.5 million (€14 million) ⁽¹⁾	No data	Increase in hectares under cultivation of 9,600 flood protected areas and 30,000 hectares which had previously had high groundwater levels ⁽¹⁾	
References: ¹ World Bank (2005)						
Project	Grey	Green	Soft	Planned or delivered		
Reconstruction project for Eastern Slavonia, Baranja and Western Srijem ⁽¹⁾	Repair of 140 km of levees ⁽¹⁾	804km of primary and secondary canals cleared ⁽¹⁾	None reported	Delivered		
References: ¹ World Bank (2005)						
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks	
Reconstruction project for Eastern Slavonia, Baranja and Western Srijem ⁽¹⁾	The population of a number of species, including indicator	None reported	None reported	Rebuilding of the Vinkovci waste water treatment plant ⁽¹⁾	None reported	

CROATIA		Between 2002 and 2013, for the 6 floods recorded the total direct costs were €480 million (damages only available for 3 out of 6 floods, damages extrapolated across all 6 floods). The average cost per flood was €80 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
	species, increased during the project life ⁽¹⁾				
References: ¹ World Bank (2005)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
1	-
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Environmental Protection and Energy Efficiency Fund (EPEEF)									x							
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	151,761	
SMEs taking actions to improve resource efficiency		
	HR	EU28
Measures to save energy	64%	67%
Measures to minimise waste	54%	67%
Measures to save water	39%	51%
Measures to save materials	44%	59%
Many measures	10%	35%
No measures	1%	6%
Comprehensive systems for energy efficiency	N/A	4.26%
Benefitting from public support for measures	6%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	8,027	14,336	19,546	10,324
Energy savings (kwh/year)	272,640	307,812	10,199	172,302
CO2 savings (tonnes/year)	208	124	4	61
Savings in waste (tonnes/year)	1	2	145	16
Savings in raw materials (tonnes/year)	55	17,689	424	739
Savings in water (m ³ /year)	NA	NA	NA	NA
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	143	402	1309%	-6.4%
Breakdown by category				
Protection of ambient air and climate	0.4	49.9	173%	-30.7%
Wastewater management	24.4	152	2444%	40.6%
Waste management	97.4	67.6	4153%	11.7%
Protection and remediation of soil, groundwater and surface water	14.7	42	777%	-0.17
Noise and vibration abatement	0.2	6	900%	1.15
Protection of biodiversity and landscapes	4.3	7.3	30%	0.09

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Protection against radiation	Unknown	Unknown	Unknown	Unknown
Research and development for environmental protection	Unknown	Unknown	Unknown	Unknown
Other environmental protection activities	1.4	77.2	-18.6%	-0.4
<p>Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.</p> <p>Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).</p> <p>Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable</p>				
Category	2011		EU average for 2011	
Public environmental expenditure as percentage of total public expenditure	0.7%		1.34%	
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014			
Total environmental expenditure as percentage of GDP	2011		EU average for 2011	
	1.44%		2.26%	
	Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)	

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2011	EU total for 2011
		unavailable
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014.	
	Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	Funding received from the following sources: Life+ ⁽¹⁾ ; European funds (ERDF, CF & IPA) ⁽²⁾
	Sources: ¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ² European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013

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1.1 Financial, economic and social costs of floods

CYPRUS				Between 2002 and 2013, 0 floods were recorded that exceeded the EM-DAT thresholds. Three floods were recorded (1 in 2006 and 2 in 2003) but there is no quantified information recorded on these floods such that it is not possible to determine whether they exceed the threshold used for inclusion in this study		
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)		
Assumptions and caveats: there were three floods in Cyprus between 2002 and 2013, but as noted above it is unclear whether these exceeded the EM-DAT thresholds used for inclusion in this study						
EU Solidarity fund				Between 2002 and 2013, no applications were made to the EU Solidarity fund		
Year	Total direct damage (€million)	Funds received	Reason(s) for application			
No applications						
References: Inforegio (2013); European Commission (2012)						
Investments made				Between 2002 and 2013, €233 million was invested in flood risk management measures, equivalent to €21 million* per year on average. €227 million was from EU funds (2007-2013) (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:		
1998-2008	0.5 per year ⁽¹⁾	No data	No data	Implementation of Master Plan (mainly focused on erosion) ⁽¹⁾		
	0.4 per year ⁽¹⁾	No data	No data	Monitoring of the coast ⁽¹⁾		
1998-2015	15 (mean of 0.9 per year) ⁽¹⁾	No data	No data	Total investment made for flooding and erosion on the coast ⁽¹⁾		
2007-2013	-	227 ⁽²⁾	Cohesion Fund	Investment in the environment. Particular emphasis placed on investments designed to mitigate climate change and encourage the use of renewable sources of energy ⁽²⁾ . Limited/no data on specific allocation from other funds		
References: ¹ Policy Research Corporation (2009); ² European Union Cohesion Policy (nd)						
Assumptions and caveats: *Based on annual investment of €0.6 million (mean of €0.5, €0.4 and € 0.9 million) plus €227 million						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	19 APSFRs identified in PFRA	No data	No data	No data	Flash and urban floods are greatest risks; urban most frequent.	2010

CYPRUS				Between 2002 and 2013, 0 floods were recorded that exceeded the EM-DAT thresholds. Three floods were recorded (1 in 2006 and 2 in 2003) but there is no quantified information recorded on these floods such that it is not possible to determine whether they exceed the threshold used for inclusion in this study		
					No risks from fluvial or coastal flooding	
References: Aristeidou (2012)						
Project	Investment made		EU funds	Funding source	Other sources	
SATFLOOD project	No data found		No data found	European Regional Development Fund ⁽¹⁾	Republic of Cyprus	
References: ¹ Technological University of Cyprus (2014)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
SATFLOOD project	Covers the whole of Cyprus but focuses on urban areas	No data	No data	No data	Project will create flood hazard maps and assist in reduction of risk to people, property and the environment ⁽¹⁾	
References: ¹ Technological University of Cyprus (2014)						
Assumptions and caveats: Although the main purpose of the dam is to collect and transfer water for irrigation purposes, it is also assumed that it will offer a degree of flood protection.						
Project	Grey	Green	Soft	Planned or delivered		
SATFLOOD project	None	None	Development of digital maps of urban development and flood mapping in order to create flood hazard maps ⁽¹⁾	Delivered ⁽¹⁾		
References: ¹ Technological University of Cyprus (2014)						
Assumptions and caveats:						
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks	
SATFLOOD project	None reported	None reported	None reported	None reported	Project aims to assist with reduction of future flood risks ⁽¹⁾	
References: ¹ Technological University of Cyprus (2014)						

1.2 SMEs and Resource Efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
1	-
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Training programme on environmental management										x						
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	42,440	
SMEs taking actions to improve resource efficiency		
	CY	EU28
Measures to save energy	45%	67%
Measures to minimise waste	24%	67%
Measures to save water	38%	51%
Measures to save materials	34%	59%
Many measures	14%	35%
No measures	21%	6%
Comprehensive systems for energy efficiency	5%	4.26%
Benefitting from public support for measures	3%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	65,91	11,771	16,049	8,477
Energy savings (kwh/year)	492,159	555,649	18,412	311,032
CO2 savings (tonnes/year)	376	224	7	110
Savings in waste (tonnes/year)	3	10	579	64
Savings in raw materials (tonnes/year)	45	14,525	348	607
Savings in water (m ³ /year)	51	1184	10	37

Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses> accessed on 31 January 2014

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2010		Change between 2008 and 2010	
	Public	Private	Public	Private
Total	Unavailable	62	Unavailable	125%
Breakdown by category				
Protection of ambient air and climate	Unavailable	6.6	Unavailable	-6.2%
Wastewater management	Unavailable	8.8	Unavailable	20.7%
Waste management	Unavailable	13.5	Unavailable	36.4%
Protection and remediation of soil, groundwater and surface water	Unavailable	Unavailable	Unavailable	Unavailable
Noise and vibration abatement	Unavailable	1.07	Unavailable	664%
Protection of biodiversity and landscapes	Unavailable	Unavailable	Unavailable	Unavailable
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	Unavailable	32.14	Unavailable	911%

Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.

Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).

Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid

Environmental expenditure for latest year for which data are available (€ million)		
mixing data sources. Data from two or more Member States may not necessarily be comparable		
Category	2011	EU average for 2011
Public environmental expenditure as percentage of total public expenditure	Unavailable	1.34%
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014	
Total environmental expenditure as percentage of GDP	2011	EU average for 2011
	Unavailable	Unavailable
	-	2.26%
		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
	2011	EU total for 2011
Number of jobs in the environmental goods and services sector (1000s)	Eurostat data Unavailable	4,194
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	Funding received from the following sources: Life+ ⁽¹⁾ ; European funds (ERDF, CF & IPA) ⁽²⁾ ; The European Fisheries Fund ⁽³⁾ ; The European Agricultural Fund for Rural Development ⁽⁴⁾
	¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ² European Commission (nd): Regional Policy – INFOREGIO. In your country.

Environment related EU funding	
	<p>Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013.</p> <p>³ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁴ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

Czech Republic				Between 2002 and 2013, for the 12 floods recorded the total direct costs were €8,200 million (damages only found for 6 out of 12 floods, damages extrapolated across all 12 floods). The average cost per flood was €690 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€2,340 ⁽¹⁾	18 ⁽⁴⁾	136 ⁽⁵⁾	200,000 affected ⁽⁴⁾
2003	N/Q	No data	No data	20 homes without electricity ⁽⁸⁾
2005	N/Q	1 ⁽⁴⁾	No data	
2006	€220 ⁽²⁾	9 ⁽⁶⁾	No data	48,000 ha of farmland flooded ⁽⁶⁾
2007	N/Q	No data	No data	300 people displaced ⁽⁶⁾
2009	€320 ⁽²⁾	15 ⁽²⁾	No data	14,450 people affected ⁽⁴⁾
2010	€600 ⁽²⁾	8 ⁽²⁾	600 ⁽⁸⁾	120 people became homeless ⁽⁷⁾
2013	€637 ⁽³⁾	15 ⁽³⁾	No data	1,300,000 people affected ⁽⁴⁾
References and sources of information: ¹ Czech Republic (2002); ² Naše Voda (2012); ³ Minister of Finance of the CR (2013); ⁴ CRED (nd); ⁵ Ústecký kraj (2010); ⁶ DFO (nd); ⁷ Minister of Finance of the Czech Republic (2010); ⁸ radio.cz (2003)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, €161 million was received from the EU Solidarity Fund. Total direct damages were €3,578 million. 4 applications were accepted and 0 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2002	€2,300	€129	Major flooding	
2010	€205	€5.1	Floods (neighbouring country)	
	€437	€11	Regional flooding	
2012	€637	€16	Floods (neighbouring country)	
References: Inforegio (2013); European Commission (2012)				

Czech Republic				Between 2002 and 2013, for the 12 floods recorded the total direct costs were €8,200 million (damages only found for 6 out of 12 floods, damages extrapolated across all 12 floods). The average cost per flood was €690 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Investments made				Between 2002 and 2013, €5,100 million (average) was found to have been spent on flood risk management measures within an unspecified period. €5,000 million was from EU funds (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:		
Not specified	€99 (average)	No data	No data	Costs of preventative measures (considered to probably be an under-estimate of actual investment needs) ⁽¹⁾		
Not specified	€1 (average)	No data	No data	Operating and maintenance costs ⁽¹⁾		
2007-2013	-	€5,000	Cohesion Fund	Invested in direct measures such as waste water treatment, nature and air protection and risk prevention ⁽²⁾ . Limited/no data on specific allocation from other funds		
References: ¹ GHK (2006); ² European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	No data	75,000 inhabitants in 850 municipalities ⁽²⁾	26,031 buildings (24,000 residential) ⁽²⁾	No data	1:20 ⁽²⁾	Not specified ⁽²⁾
	No data	368,000 inhabitants in 1,499 municipalities ⁽²⁾	90,381 buildings (88,000 residential and 157,000 flats) ⁽²⁾	No data	1:100 ⁽²⁾	Not specified ⁽²⁾
	No data	5% of inhabitants live in potential flood risk ⁽³⁾	No data	5% of value of major types of properties at risk ⁽³⁾	1:100 (medium probability) ⁽³⁾	Not specified ⁽³⁾
	No data	3.5% of all inhabitants affected (~350,000) ⁽⁴⁾	No data	No data	1:100 ⁽⁴⁾	Not specified ⁽⁴⁾
	APSFR include Kyjovka, Stara Morava, Morava,	No data	No data	No data	No data	2011 ⁽¹⁾

Czech Republic		Between 2002 and 2013, for the 12 floods recorded the total direct costs were €8,200 million (damages only found for 6 out of 12 floods, damages extrapolated across all 12 floods). The average cost per flood was €690 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)				
Current risk	Dyje, Danlz, Dyje ⁽¹⁾					
	Area	No. people	No. properties	EAD	Flood event	Data for year
	No data	No data	No data	Average per year damages of €20 million per year and 10 lives (1980-1988). Of this 40% to 50% is to agriculture, 15% to 20% damage to river beds and structures and 30% to 65% as local damages in flooded areas (excluding loss of human lives and non-economic damages) ⁽⁵⁾	No data	Not specified ⁽⁵⁾
Future risk					No data	
References: ¹ CEFrame (2011); ² Drbal K & Stepankova P (2008); ³ ICPDR (2012); ⁴ Jirasek V & Brezina P (2009); ⁵ GHK (2006)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Strategy for protection against floods	€750 million (2002-2012) ⁽¹⁾	None	European Investment Bank financing less than 50% ⁽¹⁾	Other financiers including the State budget and the River Boards' financing the remainder ⁽¹⁾		
References: ¹ Climate Finance Options (nd)						

Czech Republic			Between 2002 and 2013, for the 12 floods recorded the total direct costs were €8,200 million (damages only found for 6 out of 12 floods, damages extrapolated across all 12 floods). The average cost per flood was €690 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits
Strategy for protection against floods	Across the whole country in the five river basins (Morava, Labe, Ohre, Odra and Vltava) ⁽¹⁾	No data	No data	No data	Increased protection of a total of 850,000 people ⁽¹⁾
References: ¹ Climate Finance Options (nd)					
Project	Grey	Green	Soft	Planned or delivered	
Strategy for protection against floods	Construction or maintenance of reservoirs and dams, increase in flow capacity of watercourse channels, protective dams, discharge channels, etc. ⁽¹⁾	De-sludging and upgrading of existing pond systems to better utilise them for retention of flood waters ⁽²⁾	None reported	Delivered*	
References: ¹ European Investment Bank (2006); ² European Investment Bank (2006a)					
Assumptions and caveats: *Project planned 2002-2012 therefore delivered however information provided here was for the planning					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Strategy for protection against floods	None reported	None reported	None reported	None reported	None reported

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
5	2
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Eco-energy									x							
Operational Programme Environment									x							
South Bohemia Regional Programme															x	x
The Czech Environment Management Centre				x				x		x						
EKO-INFO																
The Programme of Support for Small and Medium-sized Enterprises									x							
The State program of environmental training and education										x						
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	927,692	
SMEs taking actions to improve resource efficiency		
	CZ	EU28
Measures to save energy	75%	67%
Measures to minimise waste	78%	67%
Measures to save water	56%	51%
Measures to save materials	66%	59%
Many measures	38%	35%
No measures	4%	6%
Comprehensive systems for energy efficiency	5%	4.26%
Benefitting from public support for measures	7%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	8,079	14,428	19671	10390
Energy savings (kwh/year)	553,717	625,149	20,714	349,935
CO2 savings (tonnes/year)	423	252	8	124
Savings in waste (tonnes/year)	5	16	971	108
Savings in raw materials (tonnes/year)	55	17803	427	744
Savings in waste (m ³ /year)	52	1190	10	37

Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses> accessed on 31 January 2014

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	795	1,438	47%	13%
<i>Breakdown by category:</i>				
Protection of ambient air and climate	10.6	313	96%	22%
Wastewater management	348	436	89%	3.5%
Waste management	333	Unavailable	17.8%	Unavailable
Protection and remediation of soil, groundwater and surface water	32.8	Unavailable	198%	Unavailable
Noise and vibration abatement	26	Unavailable	-23.5%	Unavailable
Protection of biodiversity and landscapes	20	Unavailable	74.8%	Unavailable
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	25.4	Unavailable	83.6%	Unavailable

Environmental expenditure for latest year for which data are available (€ million)		
Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.		
Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).		
Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable		
Category	2011	EU average for 2011
Public environmental expenditure as percentage of total public expenditure	1.18%	1.34%
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014	
Total environmental expenditure as percentage of GDP	2.19%	2.26%
	Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/data_base on 31 January 2014	Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2011	EU total for 2011
	Eurostat data unavailable	4,194
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014.	
	Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Life+⁽¹⁾; European funds (ERDF, CF & IPA)⁽²⁾; The European Fisheries Fund⁽³⁾; The European Agricultural Fund for Rural Development⁽⁴⁾</p> <p>Sources: ¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ² European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ³ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁴ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

DENMARK				Between 2002 and 2013, for the 3 floods recorded the total direct costs were €1,400 million. The average cost per flood was €450 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)		
2005	€617 ^(1,a)	4 ⁽³⁾	No data	Around 60,000 households lost power in northern Jutland ⁽³⁾		
2011	€671 ⁽²⁾	No data	No data			
2013	€62 ⁽⁴⁾	No data	No data			
References and sources of information: ¹ Carpenter G (2005); ² Mufti S (2012); ³ Haanpaa S et al (2006); ⁽⁴⁾ Pers. Comm (Danish Ministry of Environment)						
Assumptions and caveats: ^a costs for storm damage including floods Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised						
EU Solidarity fund				Between 2002 and 2013, no applications for EU Solidarity fund were made		
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats:		
No applications						
References: Inforegio (2013); European Commission (2012)						
Investments made				Between 1998 and 2015, €255 million was invested on protection against coastal flooding and erosion (based on equal spending per year). Average investment was €23 million per year*. €38 million was from EU funds (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund		
2008	€14 ⁽¹⁾	No data	No data	Expenditure on protection against coastal flooding and erosion ⁽¹⁾		
1998-2015	€315 ⁽¹⁾	No data	No data	Total for coastal protection (flooding and erosion) ⁽¹⁾		
2007-2013	-	€38 ⁽²⁾	Cohesion Fund	Protecting the environment and promoting sustainable growth ⁽²⁾ . Limited/no data on specific allocation from other funds		
References: ¹ Policy Research Corporations (2009); ² European Union Cohesion Policy (nd)						
Assumptions and caveats: * Average calculated from 2002 to 2015						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	No data	No data	Vulnerable low-lying	No data	No data	Not specified

DENMARK			Between 2002 and 2013, for the 3 floods recorded the total direct costs were €1,400 million. The average cost per flood was €450 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
			areas along the coast contain 60,000 to 70,000 properties			
Future risk	No data	No data	No data	No data	No data	No data
References: Fenger J et al (2008)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Six mayors have joined forces to flood-proof an area around a river	DKK 40 million (€ 5.4 million)* (plans began in 2013)	None	Primarily financed by Rail Net Denmark	No data		
References: Climate Change Adaptation (2013)						
Assumptions and caveats: * Average exchange rate of 0.1341 for 2013 used (www.oanda.com)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
Six mayors have joined forces to flood-proof an area around a river ⁽¹⁾	The six municipalities that make up Vestegnen	No data	No data	No data	Preserving the grazing area by Vallensbaek Marsh	
References: Climate Change Adaptation (2013)						
Project	Grey	Green	Soft	Planned or delivered		
Six mayors have joined forces to flood-proof an area around a river	An emergency pump will be installed at Ishøj Harbour to pump river water over the sluice during prolonged high water levels	To avoid flooding of residential neighbourhood, controlled flooding will be performed on the marsh	None reported	Planned (it is anticipated that the new system will be ready in 2014)		
References: Climate Change Adaptation (2013)						
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks	
Six mayors have joined forces to flood-proof an area around a river	Preserving the grazing area by Vallensbaek Marsh	Establish flood retention basins in Høje – Taastrup to treat the stormwater before discharge	None reported	None reported	None reported	
References: Climate Change Adaptation (2013)						

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
9	4
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Green Business Growth [Grøn Erhvervsvekst]										x	x	x				
Danish Energy Agency				x	x											
Danish Growth Capital [Dansk Vækstkapital]									x							
Green 21				x	x			x				x				
Green Network												x				x
Green Transition Fund [Grøn Omstillingsfond]									x							
Key2Green				x	x	x										
Market Development Fund: Markedsmodningsfonden									x							
Netmatch								x				x				
Start Growth [Startvekst] Regional Business Development Centres (Væksthusene)											x	x		x		
Strengthening Innovation in Firms [Styrket Innovation i Virksomhederne]												x				
Subsidy for eco-efficient technology [Tilskudsordning til miljøeffektiv teknologi]									x							
The Growth Wheel for Green Business [VækstHjulet]				x				x				x				
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and Resource Efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	212,963	
SMEs taking actions to improve resource efficiency		
	DK	EU28
Measures to save energy	59%	67%
Measures to minimise waste	39%	67%
Measures to save water	33%	51%
Measures to save materials	45%	59%
Many measures	14%	35%
No measures	6%	6%
Comprehensive systems for energy efficiency	5%	4.26%
Benefitting from public support for measures	7%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	8,406	15,012	20,467	10,811
Energy savings (kwh/year)	481,612	543,742	18,017	304,367
CO2 savings (tonnes/year)	368	219	7	108
Savings in waste (tonnes/year)	21	76	4,494	501
Savings in raw materials (tonnes/year)	57	18,523	444	774
Savings in water (m ³ /year)	455	10,488	93	328
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2008		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	1,552	Unavailable	Unavailable	Unavailable
Breakdown by category				
Protection of ambient air and climate	111	Unavailable	Unavailable	Unavailable
Wastewater management	0.26	Unavailable	Unavailable	Unavailable
Waste management	40	Unavailable	Unavailable	Unavailable
Protection and remediation of soil, groundwater and surface water	92	Unavailable	Unavailable	Unavailable
Noise and vibration abatement	3.4	Unavailable	Unavailable	Unavailable

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2008		Change between 2008 and 2011	
	Public	Private	Public	Private
Protection of biodiversity and landscapes	496	Unavailable	Unavailable	Unavailable
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	810	Unavailable	Unavailable	Unavailable
<p>Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.</p> <p>Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).</p> <p>Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable</p>				
Category	2008		EU average for 2008	
Public environmental expenditure as percentage of total public expenditure	1.28%		1.38%	
	<p>Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014</p>			
Total environmental expenditure as percentage of GDP	Unavailable		2.24%	
	<p>-</p> <p>Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)</p>			

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2008	EU total for 2008
		Eurostat Data Unavailable
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014.	
	Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Eco-Innovation fund⁽¹⁾; Life+⁽²⁾; The European Fisheries Fund⁽³⁾; The European Agricultural Fund for Rural Development⁽⁴⁾</p> <p>Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-projects.eu/eco/page/Page.jsp on 1 December 2013. ² Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ³ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁴ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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SBA Fact Sheets (2013): SBA Country Fact Sheets, European Commission, accessed at: <http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/> on 31 January 2014.

1.1 Financial, economic and social costs of floods

ESTONIA				Between 2002 and 2013, for the 2 floods recorded the total direct costs were €390 million (damages available both floods). The average cost per flood was €190 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)		
2003	€339 ⁽¹⁾	No data	No data	Saka village completely underwater ⁽¹⁾		
2005	€48 ⁽²⁾	No data	14 ⁽³⁾	In Parnu 775 houses were affected by floods. Some 159 houses in Haapsula affected ⁽²⁾		
References and sources of information: ¹ DFO (nd); ² Haanpaa S et al (2005); Carpenter (2006)						
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised						
EU Solidarity fund				Between 2002 and 2013, no applications for EU Solidarity fund were made		
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats:		
No applications						
References: Inforegio (2013); European Commission (2012)						
Investments made				Between 2002 and 2015, €1,002 million was invested in flood risk management measures. An average of €91 million was invested per year. €1 billion was from EU funds (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:		
2008	€0.1 ⁽¹⁾	No data	No data	Total for coast protection (flooding and erosion) ⁽¹⁾		
2002-2015	€2 ⁽¹⁾	No data	No data			
2007-2013	-	€1,000 ⁽²⁾	Cohesion Fund	Improving the environment and promoting sustainable growth ⁽²⁾		
References: ¹ Policy Research Corporation (2009); ² European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	No data	18% of the population (254,000) were affected by storm Gudrun ⁽¹⁾	No data	No data	No data	2005

ESTONIA			Between 2002 and 2013, for the 2 floods recorded the total direct costs were €390 million (damages available both floods). The average cost per flood was €190 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
		10% of the population is at risk from rainfall ⁽²⁾				Not specified
		Half the population of Tallinn (430,000) live within a 2km coastal zone ⁽³⁾				Not specified ⁽²⁾
Future risk	No data	5% of the population is projected to be at risk from sea level rise ⁽²⁾	No data	No data	No data	Not specified
		About 3% of the country would be inundated or temporarily damaged, requiring relocation of about 40,000 inhabitants ⁽⁴⁾			1m sea level rise ⁽⁴⁾	2010 ⁽⁴⁾
References: ¹ Astra Project (nd); ² GHK (2006); ³ European Commission (2010); ⁴ Kont A et al (2008)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Low-cost shoreline management for a large harbour city and adjacent eroded shorelines	€2,500/ha for coastal forest maintenance €70,000 for cost of seawall/slope protection	No data	No data	No data		
References: Povilanskas R et al (2002)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
Low-cost shoreline management for a large harbour city and	Marine coast within the Tallinn area	Total capital at risk €0.4-0.6 million if	No data	No data	Works to maintain the socio-economic	

ESTONIA		Between 2002 and 2013, for the 2 floods recorded the total direct costs were €390 million (damages available both floods). The average cost per flood was €190 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)				
adjacent shorelines eroded	between Kakumae and Muuga bays. Includes Tallinn urban municipality, Viimsi suburban municipality and Harju county	coastal erosion remains the same. If it increases capital at risk increases to €20-40 million				functions of the coast
References: Povilanskas R et al (2002)						
Project	Grey	Green	Soft	Planned or delivered		
Low-cost shoreline management for a large harbour city and adjacent eroded shorelines	Construction of seawall/slope protection at Tallinn-Pirita, Pringi-Puunsi and Kakumae	Re-vegetation of forestry to reduce erosion Nourishment of Pirita beach	None reported	Probably delivered*		
References: Povilanskas R et al (2002)						
Assumptions and caveats: *these actions were undertaken between 1970 and 2000 but were again planned in 2002						
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks	
Low-cost shoreline management for a large harbour city and adjacent eroded shorelines	None reported	None reported	None reported	None reported	None reported	
References:						

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
3	-
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Ecotoolkit					x	x										
EMAS Easy MOVE-IT				x		x		x		x	x					x
KredEx									x							
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	55,113	
SMEs taking actions to improve resource efficiency		
	EE	EU28
Measures to save energy	27%	67%
Measures to minimise waste	18%	67%
Measures to save water	13%	51%
Measures to save materials	34%	59%
Many measures	3%	35%
No measures	37%	6%
Comprehensive systems for energy efficiency	4%	4.26%
Benefitting from public support for measures	2%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	5,097	9,102	12,410	6,555
Energy savings (kwh/year)	558,873	630,971	20,907	353,194
CO2 savings (tonnes/year)	427	254	8	125
Savings in waste (tonnes/year)	13	45	2,648	295
Savings in raw materials (tonnes/year)	35	11231	269	469
Savings in water (m ³ /year)	5	126	1	4
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2010		Change between 2008 and 2010	
	Public	Private	Public	Private
Total	23	Unavailable	-9.93%	Unavailable
<i>Breakdown by category:</i>				
Protection of ambient air and climate	Unavailable	54	Unavailable	Unavailable
Wastewater management	9.6	Unavailable	-4.94%	Unavailable
Waste management	8.6	Unavailable	-20%	Unavailable
Protection and remediation of soil, groundwater and surface water	0.16	Unavailable	-74%	Unavailable
Noise and vibration abatement	0	0.22	-100%	Unavailable
Protection of biodiversity and landscapes	1.59	Unavailable	-14.5%	Unavailable
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	Unavailable	Unavailable	Unavailable	Unavailable
Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.				
Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).				
Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable				
Category	2010		EU average for 2010	
Public environmental expenditure as percentage of total public expenditure	0.40%		1.38%	
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014			

Environmental expenditure for latest year for which data are available (€ million)		
Total environmental expenditure as percentage of GDP	2010	EU average for 2010
		Unavailable -
		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
	2010	EU total for 2010
Number of jobs in the environmental goods and services sector (1000s)	Eurostat data unavailable	4,087
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Life+⁽¹⁾; The European Fisheries Fund⁽²⁾; The European Agricultural Fund for Rural Development⁽³⁾</p> <p>Sources: ¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ² European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ³ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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- SBA Fact Sheets (2013): SBA Country Fact Sheets, European Commission, accessed at: <http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/> on 31 January 2014.

1.1 Financial, economic and social costs of floods

FINLAND				Between 2002 and 2013, for the 11 floods recorded the total direct costs were €170 million (damages found for 4 out of 11 floods, damages extrapolated across all 11 floods). The average cost per flood was €15 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)		
2003	€0.3 ⁽¹⁾	No data	No data	50 emergencies ⁽¹⁾		
2004	€8 ⁽²⁾	No data	No data	Buildings and bridges damaged ⁽⁹⁾		
2005	€20 ⁽³⁾	No data	No data	10's of residences and numerous leisure properties affected ⁽⁶⁾		
2006	N/Q	No data	No data	High sea water levels killed almost the entire fish stock ⁽²⁾		
2007	€22 ⁽⁴⁾	No data	No data	130-300 property owners reported damages, some people got skin infections ⁽⁷⁾		
2012	€10 ⁽⁵⁾	No data	No data	Dozens of houses cut off in Mankila ⁽⁸⁾		
2013	N/Q	No data	No data	Residential buildings affected by floods ⁽¹⁰⁾		
References and sources of information: ¹ Maa- ja metsätalousministeriölle (2009); ² Elinkeino-, liikenne- ja ympäristökeskus Närings-, trafik- och miljöcentralen (2011); ³ Haanpaa S et al (2005); ⁴ Tampereen Yliopisto Johtamiskorkeakoulu (2012); ⁵ UUTISET (2012); ⁶ Finnish Consulting Group (2010); ⁷ City of Pori (2009); ⁸ Helsingin Sanomat (2012); ⁹ Etelä-Pohjanmaan elinkeino-, liikenne- ja ympäristökeskus (2011); ¹⁰ Finland Times (2013)						
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised						
EU Solidarity fund				Between 2002 and 2013, no applications for EU Solidarity fund were made		
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats:		
No applications						
References: Inforegio (2013); European Commission (2012)						
Investments made				Between 2002 and 2013, investments are unknown, currently being evaluated regionally. €156 million was from EU funds (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:		
2007-2013	-	€156	Cohesion Fund	Improving the environment, promoting sustainable growth and combating climate change		
References: European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	21 locations identified as being APSFR ⁽¹⁾	No data	No data	No data	No data	No data

FINLAND			Between 2002 and 2013, for the 11 floods recorded the total direct costs were €170 million (damages found for 4 out of 11 floods, damages extrapolated across all 11 floods). The average cost per flood was €15 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
		76,700 people (1.4% of the population) ⁽²⁾				2011 ⁽²⁾
		50,000 at risk ⁽²⁾			1:250 coastal/fluviat ⁽²⁾	
Future risk	No data	No data	No data	No data	No data	No data
References: ¹ Ymparisto (nd); ² Ymparisto (2011)						
Assumptions and caveats:						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
'Stormwater': in search of better stormwater management ⁽¹⁾	€1,539,609 (2008-2030) ⁽²⁾	€1,077,726 ⁽²⁾	ERDF ⁽²⁾	No data		
References: ¹ European Commission (nd); ² The EU Unit for Southern Finland (nd)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
'Stormwater': in search of better stormwater management ⁽¹⁾	Lahti, Kouvola and Hollola (pilot projects) ⁽²⁾	No data	No data	No data	Citizens benefit through better use of green space in cities, better water quality and lower risk of flooding ⁽¹⁾	
References: ¹ European Commission (nd); ² The EU Unit for Southern Finland (nd)						
Project	Grey	Green	Soft	Planned or delivered		
'Stormwater': in search of better stormwater management	In Kouvola a large barrier structure is being tested to see if it can prevent flooding	In Lahti a terrain structure is being tested which will absorb and delay water before it reaches the lake	None reported	Delivered		
References: ¹ The EU Unit for Southern Finland (nd)						
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks	
'Stormwater': in search of better stormwater management	Better use of green space in cities	The quality of stormwater is being analysed with a view to using it to water plants	None reported	None reported	Lower risk of flooding	
References: ¹ The EU Unit for Southern Finland (nd)						

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
3	1
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Environmental guarantee									x							
Material Efficiency Centre				x	x	x										
Sitra' Environment Programme 2005-2007												x				
Advice during inspection visits			x											x		
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	229,470	
SMEs taking actions to improve resource efficiency		
	FI	EU28
Measures to save energy	70%	67%
Measures to minimise waste	80%	67%
Measures to save water	38%	51%
Measures to save materials	80%	59%
Many measures	34%	35%
No measures	6%	6%
Comprehensive systems for energy efficiency	2%	4.26%
Benefitting from public support for measures	22%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	5,790	10,341	14,099	7,447
Energy savings (kwh/year)	561,920	634,410	21,021	355,119
CO2 savings (tonnes/year)	429	255	8	126
Savings in waste (tonnes/year)	20	71	4,185	466
Savings in raw materials (tonnes/year)	39	12,760	306	533
Savings in water (m ³ /year)	79	1,810	16	57

Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses> accessed on 31 January 2014

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2010		Change between 2008 and 2010	
	Public	Private	Public	Private
Total	1,146	666	9.67%	-7.54%
<i>Breakdown by category:</i>				
Protection of ambient air and climate	Unavailable	200	Unavailable	-14.3%
Wastewater management	523	201	14.14%	-4.21%
Waste management	152	163	5.86%	2.27%
Protection and remediation of soil, groundwater and surface water	Unavailable	56	Unavailable	-1.83%
Noise and vibration abatement	Unavailable	2.36	Unavailable	-52.8%
Protection of biodiversity and landscapes	55	Unavailable	25.72%	Unavailable
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	415	44	4.14%	-21.9%

Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.

Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).

Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure

Environmental expenditure for latest year for which data are available (€ million)		
data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable		
Category	2010	EU average for 2010
Public environmental expenditure as percentage of total public expenditure	1.15%	1.38%
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014	
	2010	EU average for 2010
Total environmental expenditure as percentage of GDP	1.14%	2.30%
	Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014	Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
	2010	EU total for 2010
Number of jobs in the environmental goods and services sector (1000s)	Eurostat data Unavailable	4,087
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Eco-Innovation fund⁽¹⁾; INTERREG IVC⁽²⁾; Life+⁽³⁾; European funds (ERDF, CF & IPA)⁽⁴⁾; The European Fisheries Fund⁽⁵⁾; The European Agricultural Fund for Rural Development⁽⁶⁾</p> <p>Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-projects.eu/eco/page/Page.jsp on 1 December 2013. ² INTERREG IVC (nd): Approved Projects Database, accessed at: http://www.interreg4c.eu/projects/ on 29 November 2013. ³ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ⁴ European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ⁵ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁶ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

FRANCE				Between 2002 and 2013, for the 48 floods recorded the total direct costs were €8,700 million (with damages for all 48 floods). The average cost per flood was €180 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€835 ⁽¹⁾	29 ⁽²⁾	No data	3,480 people affected ⁽³⁾
2003	€1,500 ⁽²⁾	10 ⁽⁴⁾	No data	2 nuclear power plants were closed ⁽⁴⁾
2005	€150 ⁽²⁾	3 ⁽³⁾	No data	4,000 people affected ⁽³⁾
2006	€90 ⁽²⁾	No data	No data	Damage and losses to 385 properties ⁽⁵⁾
2007	€565 ⁽⁶⁾	4 ^(4,6)	12 ⁽⁶⁾	70,000 people without clean water in the south ⁽⁶⁾
2008	€210 ⁽²⁾	3 ⁽⁴⁾	No data	
2009	€1,350 ⁽²⁾	11 ⁽⁴⁾	No data	Hundreds of homes and farms flooded ⁽⁴⁾
2010	€3,278 ^(7,8)	78 ⁽²⁾	79 ⁽⁹⁾	Some 100,000 households without electricity, 500 displaced ⁽⁴⁾
2011	€530 ⁽²⁾	8 ⁽²⁾	No data	2,300 people affected ⁽³⁾
2012	€100 ⁽²⁾	4 ⁽²⁾	No data	
2013	€493 ⁽³⁾	2 ⁽³⁾	No data	2,000 people affected ⁽³⁾
References and sources of information: ¹ France (2002); ² Ministère de l'Écologie, du Développement durable et de l'Énergie (2012); ³ CRED (nd); ⁴ DFO (nd); ⁵ ICPDR (2008); ⁶ Ministère de l'Intérieur (2007); ⁷ European Commission (2011); ⁸ European Commission (2010); ⁹ Kolen B et al (2010)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, €94 million was received from the EU Solidarity Fund. Total direct damages were €4,506 million. 5 applications were accepted and 1 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2002	€835	€21	Regional flooding	
2003	€785	€20	Regional flooding	
2007	€211	€5.29	Regional flooding	
	€509	€13	Regional flooding	
2010	€1,425	€36	Regional flooding	
2012	€741	Rejected	Regional flooding	
References: Inforegio (2013); European Commission (2012)				

FRANCE				Between 2002 and 2013, for the 48 floods recorded the total direct costs were €8,700 million (with damages for all 48 floods). The average cost per flood was €180 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Investments made				Between 2002 and 2013, €924 million was invested in flood risk management measures, equivalent to €84 million per year on average. Contribution from EU funds not found		
Year	Investments made (€million)	EU funds received (€million)	EU funds (€ million)	Assumptions and caveats: For investment time periods extending outside 2002-2013 it has been assumed that an equal amount was spent each year		
1998 – 2015	€207 ⁽¹⁾	No data	No data	Total expenditure on coastal protection (flooding and erosion) ⁽¹⁾		
2004 – 2008	€500 ⁽²⁾	No data	No data	Total spent on 42 programmes covering almost 25% of France for flood prevention measures ⁽²⁾		
2006 – 2013	€79 ⁽³⁾	No data	No data	Total cost of Flood Prevention Action Programmes (PARIs) ⁽³⁾		
2008	€27.3 ⁽¹⁾	No data	No data	Coastal protection in mainland France (of which €22.7 million was for Languedoc-Roussillon) ⁽¹⁾		
	€28.6 ⁽¹⁾	No data	No data	Expenditure on protection on natural coastal areas by means of land acquisition and habitat restoration works ⁽¹⁾		
2009	€155 ⁽⁴⁾	No data	No data	Expenditure for prevention of floods ⁽⁴⁾		
References: ¹ Policy Research Corporation (2009) ; ² National Audit Office (2007) ; ³ WMO & GWP (2011) ; ⁴ Commissariat Général au Développement Durable (2013)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	No data	18.5 million people including 1.4 million at risk from coastal flooding ⁽¹⁾	17.1 million permanent residences, with 20% of homes exposed to coastal flooding are single storey ⁽¹⁾	Average cost of damage caused by floods paid by the national solidarity fund is around €400 million per year. Over 9 million jobs are directly exposed to river floods and 850,000 to coastal floods (in total 1 in 3 directly affected) ⁽¹⁾	No data	2011 ⁽¹⁾
Future risk	No data	No data	No data	Additional cost of a potential major disaster could raise the economic damage caused by floods to between €1 and €1.4 billion per year ⁽²⁾	No data	2011 ⁽²⁾
References: ¹ MEDDE (2011); ² MEDDE (2012)						

FRANCE		Between 2002 and 2013, for the 48 floods recorded the total direct costs were €8,700 million (with damages for all 48 floods). The average cost per flood was €180 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
Case study examples: costs and benefits of projects					
Project	Investment made	EU funds	Funding source	Other sources	
Projet d'aménagement de la Bassée	~€500 million (estimated cost of total project) ⁽¹⁾ Annual cost of operation €4.95 million ⁽¹⁾	€1,418,592 ⁽²⁾	The project is part of the Alfa project which receives ERDF funding through the INTERREG IVB project ⁽²⁾	Unknown	
References: ¹ Seine Grand Lacs (nd); ² NW Europe (nd)					
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits
Projet d'aménagement de la Bassée	The Seine Basin – covering 78,000km ²⁽¹⁾	Preventing a flood today similar to that of 1910 avoids ⁽¹⁾ : -Damages of €17 billion -170,000 business affected - 86,000 directly flooded -850,000 inhabitants directly exposed to the risk -2 million people affected by cuts in electricity -2.7 million people affected by cuts to drinking water -4 to 5 million people affected to differing degrees The pilot project will avoid €13 million in damages every year ⁽³⁾	Hydraulic flood control and ecological restoration of wetland. The system will complement the flood protection measures already in place by preventing the volume of water building up in the Seine when the level of the Yonne (a tributary of the Seine) is increasing	€2.70 of damages avoided for every €1 invested* ⁽³⁾	-Reduce the vulnerability of the land -Inform and educate on the risk -Limit the build-up of water -Manage the crisis situation ⁽²⁾
References: ¹ Seine Grand Lacs (nd); ² Seine Grand Lacs (2010); ³ Seine Grands Lacs (2013)					
Assumptions and caveats: *Benefit cost ratio based on one pilot project rather than the 10 proposed developments					

FRANCE		Between 2002 and 2013, for the 48 floods recorded the total direct costs were €8,700 million (with damages for all 48 floods). The average cost per flood was €180 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
Project	Grey	Green	Soft	Planned or delivered	
Projet d'aménagement de la Bassée	The project will see the creation of 10 'lockers' by 58km of embankments, to provide 2,300ha of water storage between Bray-sur-Seine and Marolles-sur-Seine. The spaces will be able to stock 55 million m ³ of water. There will also be 7 pumping stations and 30 gates/valves to control the diked areas and reconnect links intersected by dikes ⁽¹⁾	The project will be integrated into the natural landscape. Each of the 10 spaces will be bordered by planted dikes. Green/bio-engineering techniques have been explored in 50-70% along the line, as an alternative to conventional engineering techniques. On the flood side, the embankment will be protected by rocky outcrops ⁽²⁾	Inform and educate on the risks ⁽³⁾	Planned (expected to be in place in 2020)	
References: ¹ Seine Grands Lacs (2013); ² Seine Grand Lacs (nd); ³ Seine Grand Lacs (2010)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Projet d'aménagement de la Bassée	The project will see the restoration and maintenance of the wetlands of the Bassée – one of the largest alluvial wetlands in France. Ecological flooding would occur annually in areas defined as having high potential. This would facilitate the return of species and habitat characteristic of the wetlands	None reported	None reported	None reported	None reported
References: Seine Grand Lacs (nd)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
9	6
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
1.2.3 Environment					X		X									X
Eco-emballages			X	X		X				X						
Eco Step		X	X		X					X	X	X		X		X
Enhanced green loan									X							
Environment and Energy Guide					X											
Environmental Technologies Fund									X							
EnVol			X													X
FOGIME fund									X							
Innovation vouchers									X							
L'ADEME (en Ile-de-France)				X					X							
PBE+ (Performance Bretagne Environnement Plus)			X	X						X						
Plan PME					X					X						
Ready eco-energy																
ACCES Rhône-Alpes/ISO 14001											X			X		
Support Project Environment							X							X	X	
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	2,517,725	
SMEs taking actions to improve resource efficiency		
	FR	EU28
Measures to save energy	62%	67%
Measures to minimise waste	60%	67%
Measures to save water	54%	51%
Measures to save materials	41%	59%
Many measures	26%	35%
No measures	11%	6%
Comprehensive systems for energy efficiency	5%	4.26%
Benefitting from public support for measures	8%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	14,635	26,136	35,634	18,822
Energy savings (kwh/year)	337,324	380,840	12,619	213,180
CO2 savings (tonnes/year)	258	153	5	75
Savings in waste (tonnes/year)	18	64	3,788	422
Savings in raw materials (tonnes/year)	99	32,249	774	1,348
Savings in water (m ³ /year)	42	973	9	30
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2010		Change between 2008 and 2010	
	Public	Private	Public	Private
Total	13,829	4624	8.38%	Unavailable
<i>Breakdown by category:</i>				
Protection of ambient air and climate	1194	515	43.1%	Unavailable
Wastewater management	1816	693	10.1%	Unavailable
Waste management	1853	1377	-0.06%	Unavailable
Protection and remediation of soil, groundwater and surface water	859	246	-5.65%	Unavailable
Noise and vibration abatement	198	34	15.1%	Unavailable
Protection of biodiversity and landscapes	1409	155	8.45%	Unavailable

Environmental expenditure for latest year for which data are available (€ million)				
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	6501	1605	2.64%	Unavailable
<p>Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.</p> <p>Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).</p> <p>Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable</p>				
Category	2010		EU average for 2010	
Public environmental expenditure as percentage of total public expenditure	1.26%		1.38%	
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014			
Total environmental expenditure as percentage of GDP	2010		EU average for 2010	
	2.43%		2.30%	
	Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014;		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)	
	GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014			

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	201	EU total for 2011
	417	4,194
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	Funding received from the following sources: Eco-Innovation fund ⁽¹⁾ ; INTERREG IVC ⁽²⁾ ; Life+ ⁽³⁾ ; European funds (ERDF, CF & IPA) ⁽⁴⁾ ; The European Fisheries Fund ⁽⁵⁾ ; The European Agricultural Fund for Rural Development ⁽⁶⁾
	Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-projects.eu/eco/page/Page.jsp on 1 December 2013. ² INTERREG IVC (nd): Approved Projects Database, accessed at: http://www.interreg4c.eu/projects/ on 29 November 2013. ³ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ⁴ European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ⁵ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁶ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014

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1.1 Financial, economic and social costs of floods

Germany				Between 2002 and 2013, for the 11 floods recorded the total direct costs were €34,000 million (damages only available for 6 out of 11 floods, damages extrapolated across all 8 floods). The average cost per flood was €3,100 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€9,200 ⁽¹⁾	27 ⁽⁴⁾	108 ⁽⁴⁾	The main railway track between Dresden and Prague was closed for more than 4 months ⁽⁷⁾
2003	N/Q	7 ⁽³⁾	No data	1,500 people displaced ⁽³⁾
2005	€175 ⁽²⁾	1 ⁽⁴⁾	No data	Entire town of Eschenloe was ordered to evacuate ⁽⁸⁾
2006	N/Q		No data	Around 2,000 workers engaged in flood defence in the Pfaffenhofen district ⁽⁹⁾
2007	€175 ⁽³⁾	2 ⁽³⁾	No data	Fire brigade took part in 200 operations with approximately 260 men (including 180 volunteers) ⁽¹⁰⁾
2009	€14 ⁽⁴⁾	No data	No data	Fields and roads flooded ⁽¹¹⁾
2010	€839 ⁽⁵⁾	3 ⁽⁴⁾	No data	More than 2,000 ha of farmland was damaged by flooding and significant losses to fish stocks ⁽⁵⁾
2011	N/Q	4 ⁽⁴⁾	No data	Many roads in the Rhine Valley were closed and commercial shipping was banned to the city of Cologne ⁽³⁾
2013	€8,154 ⁽⁶⁾	8 ⁽⁶⁾	128 ⁽¹²⁾	More than 32,000 houses were damaged or destroyed and more than 100,000 people evacuated ⁽⁶⁾
References and sources of information: ¹ Bundesministerium der Finanzen (2002); ² ICPDR (nd); ³ DFO (nd); ⁴ CRED (nd); ⁵ Bundesministerium der Finanzen (2010); ⁶ Germany Federal Ministry of Finance (2013); ⁷ Thieken et al (2005); ⁸ Expatca.com (2005); ⁹ ICPDR (2008); ¹⁰ Einfalt et al (2008); ¹¹ gccapitalideas.com (2009)				
Assumptions and caveats: Only floods for which information has been found have been used; those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, €804 million was received from the EU Solidarity Fund. Total direct damages were €18,200 million. 2 applications were accepted and 1 rejected
Year	Total direct damage (€millions)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2002	€9,100	€444	Major flooding	
2010	€938	Rejected	Regional flooding (Sachsen)	
2013	€8,154	€361	Major flooding	
References: Info regio (2013); European Commission (2012)				

Germany				Between 2002 and 2013, for the 11 floods recorded the total direct costs were €34,000 million (damages only available for 6 out of 11 floods, damages extrapolated across all 8 floods). The average cost per flood was €3,100 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Investments made				Between 2002 and 2013, €5,788 million was invested in flood risk management measures (based on equal expenditure per year), equivalent to €526 million per year on average. €4,300 million was from EU funds (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:		
1990-2012	€600 ⁽¹⁾	No data	No data	Hamburg, total ⁽¹⁾		
	€2 per year ⁽¹⁾	No data	No data	Hamburg, maintenance ⁽¹⁾		
1998-2015	€2,300 ⁽¹⁾	No data	No data	Total expenditure on coastal protection (flooding and erosion) ⁽¹⁾		
2001-2015	€282 ⁽¹⁾	No data	No data	Schleswig-Holstein, total (€250 million to strengthen primary weirs) ⁽¹⁾		
	€15 per year ⁽¹⁾	No data	No data	Schleswig-Holstein, maintenance ⁽¹⁾		
2008	€135 ⁽¹⁾	No data	No data	Total expenditure on coastal protection (flooding and erosion) ⁽¹⁾		
2008	€1,900 ⁽¹⁾	No data	No data	Coastal defence plans (costs of capital measures only) ⁽¹⁾		
2007-2025	€520 ⁽¹⁾	No data	No data	Lower Saxony ⁽¹⁾		
	€205 ⁽¹⁾	No data	No data	Bremen ⁽¹⁾		
Not specified	€128 ⁽¹⁾	No data	No data	Mecklenburg-Vorpommern, total ⁽¹⁾		
	€2 per year ⁽¹⁾	No data	No data	Mecklenburg-Vorpommern, maintenance ⁽¹⁾		
2007-2013	-	4,300 ⁽²⁾	Cohesion Fund	Actions targeted at improving the environment, including measures to combat climate change which will benefit from some €2 billion ⁽²⁾ . Limited/no data on specific allocation from other funds		
References: ¹ Policy Research Corporation (2009); ² European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	15,060 km ²	29,800 people in coastal region (total of 3.2 million people in region)	No data	1.2 million jobs in low-lying coastal area at risk of flooding	1995 scenario	Not specified
Future risk	No data	Without measures, the population	No data	Damages without measures are	No data	2100

Germany			Between 2002 and 2013, for the 11 floods recorded the total direct costs were €34,000 million (damages only available for 6 out of 11 floods, damages extrapolated across all 8 floods). The average cost per flood was €3,100 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
		at risk in the low-lying coastal zone is expected to increase to 300,000 With measures, the population at risk increases to 30,000		estimated at €3.8 billion per year		
References: Sterr H (2008)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
River Elbe dike relocation project	€407 million (dike relocation) ⁽¹⁾	No data (application for LIFE funding declined) ⁽¹⁾	Federal Government, plus state of Brandenburg funded project at Lenzen ⁽²⁾	Environmental associations and environmental foundations ⁽²⁾		
References: ¹ Teichmann M & Berghöfer A (2010); ² Bundesanstalt für Wasserbau (2013)						
Assumptions and caveats: Costs given as Present Value over 90 years at a discount rate of 3%						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
River Elbe dike relocation project	Numerous potential locations for dike relocation identified (up to 26,000 ha) ⁽¹⁾	€177 million ⁽²⁾	€924 million (restoration of riparian ecosystem) ⁽²⁾ €488 million (nutrient retention) ⁽²⁾	Not given	No information provided	
References: ¹ Helmholtz Centre For Environmental Research - UFZ (2013); ² Teichmann M & Berghöfer A (2010)						
Assumptions and caveats: Damages avoided given as Present Value over 90 years at a discount rate of 3%. Total benefits of €1,184 million for dike relocation when environmental benefits are included						
Project	Grey	Green	Soft	Planned or delivered		
River Elbe dike relocation project	Options to create polders also considered and have highest benefit if only	Potential for up to 26,000ha of dike relocation, or combination of	Soft infrastructure options not included in project (but form an important part of	700 ha completed with 2,600 ha in the concrete stages		

Germany		Between 2002 and 2013, for the 11 floods recorded the total direct costs were €34,000 million (damages only available for 6 out of 11 floods, damages extrapolated across all 8 floods). The average cost per flood was €3,100 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
	flood damages avoided are included, but have far fewer benefits when environmental benefits are included ⁽¹⁾	polders and dike relocation to minimise impact of high initial costs of dike relocation ⁽¹⁾		flood risk management in Germany overall as part of Hochwasserschutzgesetz (Flood Protection Law) ⁽²⁾	of planning ⁽³⁾
References: ¹ Teichmann M & Berghöfer A (2010); ² Chavoshian A & Takeuchi K (Eds) (2011); ³ Helmholtz Centre For Environmental Research - UFZ (2013)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
River Elbe dike relocation project	€924 million (restoration of riparian ecosystem)	Not quantified	Not quantified	€488 million (nutrient retention)	€177 million (flood damages avoided)
References: Teichmann M & Berghöfer A (2010)					
Assumptions and caveats: Damages avoided and benefits given as Present Value over 90 years at a discount rate of 3% Benefits for restoration of riparian ecosystem based on willingness to pay for biodiversity value Benefits for nutrient retention based on replacement costs from avoiding need for waste water treatment					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
13	24
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
"Ressourceneffiziente Technologien Baden-Württemberg – ReTech-BW“				x					x							
Bavarian Environmental Agreement															x	x
Bavarian Environmental Consulting and Audit Programme [Bayerisches Umweltberatungs- und Auditprogramm (BUBAP)]			x											x	x	x
Climate Change Partnership								x				x				
Consultancy assistance programme															x	
Demea (Deutsche Materialeffizienzagentur) German material efficiency agency				x		x										
Ecofit			x	x				x			x			x		
Eco Step		x	x		x					x	x	x		x		x
Efficiency Agency NRW (EFA)			x	x	x	x		x						x	x	
EffNet				x	x	x	x				x					
Energieberatung [energy efficiency consultation]			x	x										x	x	
EMAS EASY Network										x				x		x
Energieeffizienz in Industrie und Gewerbe [Energy efficiency in industry and commerce]				x										x	x	
Energiewende				x							x	x			x	
Golnno with two subprograms or modules: <u>go-effizient</u> and go-innovativ (go-effizient is the module focusing on resource efficiency)				x	x									x	x	
Hessen Modell Projekte				x				x	x						x	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Informationsportal Ressourceneffizienz				x	x			x								
Innovation vouchers									x							
KfW-Energieeffizienzprogramm [Energy-efficiency-program]									x							
KMU-Innovativ [KMU = SME]				x					x							
Material Efficiency in Production															x	
NeRess (Netzwerk Ressourceneffizienz)				x							x	x				
Okoprofit										x	x	x		x		x
ProgRess (Nationales Ressourceneffizienzprogramm)				x				x								
QuB																x
RKW				x						x				x		
The Central Association of the German Trade Association (ZdH)				x								x				x
UGA (Umwelt Gutachter Ausschuss) – German EMAS Advisory Board				x							x	x				x
Umweltinnovationsprogramm (UIP)				x				x	x							
Umweltpakt Bayern [Environment Pact Bavaria]				x				x	x			x				x
Umweltpartnerschaft Brandenburg [environmental partnership]				x								x				x
Eco-cert			x	x										x		x
Umweltsiegel Brandenburg		x	x			x								x		x
Unternehmen für Ressourcenschutz				x				x	x					x	x	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
[companies for the protection of resources]																
VDI-ZRE				x		x				x						
VerMAT														x		
ZIM												x			x	
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	2,201,715	
SMEs taking actions to improve resource efficiency		
	DE	EU28
Measures to save energy	74%	67%
Measures to minimise waste	68%	67%
Measures to save water	53%	51%
Measures to save materials	61%	59%
Many measures	42%	35%
No measures	4%	6%
Comprehensive systems for energy efficiency	4%	4.26%
Benefitting from public support for measures	11%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	13,710	24,484	33,382	17,632
Energy savings (kwh/year)	471,144	531,924	17,625	297,751
CO2 savings (tonnes/year)	360	214	7	105
Savings in waste (tonnes/year)	36	127	7,513	837
Savings in raw materials (tonnes/year)	93	30,211	725	1,263
Savings in water (m ³ /year)	55	1260	11	39

Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses> accessed on 31 January 2014

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2009		Change between 2008 and 2009	
	Public	Private	Public	Private
Total	8,110	11,770	0.5%	-1.59%
<i>Breakdown by category:</i>				
Protection of ambient air and climate	Unavailable	4660	Unavailable	-1.48%
Wastewater management	3380	3430	-1.74%	0.00%
Waste management	2870	3100	-1.03%	-3.13%
Protection and remediation of soil, groundwater and surface water	Unavailable	190	Unavailable	5.56%
Noise and vibration abatement	180	210	50.0%	-12.5%
Protection of biodiversity and landscapes	1350	180	3.85%	0.00%
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	330	Unavailable	13.8%	Unavailable

Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.

Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).

Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable

Environmental expenditure for latest year for which data are available (€ million)		
Category	2009	EU average for 2009
Public environmental expenditure as percentage of total public expenditure	0.71%	1.44%
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014	
Total environmental expenditure as percentage of GDP	2009	EU average for 2009
	1.64%	2.34%
Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
	2009	EU total for 2009
Number of jobs in the environmental goods and services sector (1000s)	348	3,849
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Eco-Innovation fund⁽¹⁾; INTERREG IVC⁽²⁾; Life+⁽³⁾; European funds (ERDF, CF & IPA)⁽⁴⁾; The European Fisheries Fund⁽⁵⁾; The European Agricultural Fund for Rural Development⁽⁶⁾</p> <p>Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-projects.eu/eco/page/Page.jsp on 1 December 2013. ² INTERREG IVC (nd): Approved Projects Database, accessed at: http://www.interreg4c.eu/projects/ on 29 November 2013. ³ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ⁴ European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ⁵ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁶ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

GREECE				Between 2002 and 2013, for the 22 floods recorded the total direct costs were €4,500 million (damages only available for 5 out of 22 floods, damages extrapolated across all 22 floods). The average cost per flood was €200 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€ million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€1.4 ⁽¹⁾	1 ⁽⁶⁾	No data	309 people were affected in total ⁽²⁾
2003	€531 ⁽²⁾	No data	No data	Sewerage system and road network were damaged ⁽⁹⁾
2005	N/Q	No data	No data	10,000 ha of farmland on the Greek side of the border were flooded ⁽⁷⁾
2006	€402 ⁽³⁾	1 ⁽²⁾	No data	90% of the population around Evros river and 10% of the population of Alexandroupoli were indirectly affected ⁽³⁾
2007	N/Q	2 ^(2, 7)	No data	Hundreds of hectares of cotton and tobacco crops were destroyed ⁽¹⁰⁾
2009	€83 ⁽⁴⁾	1 ⁽⁴⁾	2 ⁽⁴⁾	Hundreds of acres of agricultural land were inundated and several crops and livestock were affected ⁽⁴⁾
2010	N/Q	1 ⁽⁷⁾	No data	In the prefecture of Ioannina, many major roads were flooded and others cordoned off to motorists, following landslides ⁽⁷⁾
2012	N/Q	4 ⁽²⁾	No data	Hundreds of homes and shops were flooded and 200 people were displaced ⁽⁷⁾
2013	€5 ⁽⁵⁾	3 ⁽⁸⁾	No data	Hundreds of homes were flooded and a factory was damaged ⁽¹¹⁾
References and sources of information: ¹ Spreadsheet received from the Special Secretariat for Water in the Ministry of the Environment, Energy and Climate Change (nd); ² CRED (nd); ³ The Government of the Hellenic Republic (2006); ⁴ The Government of the Hellenic Republic (2009); ⁵ Keptalkinggreece (2013); ⁶ Diakakis M (2013); ⁷ DFO (nd); ⁸ BBC News (2013); ⁹ Diakakis M (2010); ¹⁰ Living in Crete (2007); ¹¹ Huffingtonpost.com (2013)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, €9.3 million was received from the EU Solidarity Fund Total direct damages were €567 million 3 applications were received and 2 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2005	€112	Rejected	Regional Floods (Evros)	
2006	€372	€9.3	Regional Floods (Evros)	
2009	€83	Rejected	Regional Floods (Evia)	

GREECE				Between 2002 and 2013, for the 22 floods recorded the total direct costs were €4,500 million (damages only available for 5 out of 22 floods, damages extrapolated across all 22 floods). The average cost per flood was €200 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
References: Inforegio (2013); European Commission (2012)						
Investments made				Between 2002 and 2013 €5.5 billion was invested, all from EU funds (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:		
2007-2013	-	€5,500	Cohesion Fund	Improving the environment, promoting sustainable growth and combating climate change. €2.6 billion will be used for activities combating the effects of climate change		
References: European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	122 zones with potentially high flood risk (19% of total area of country) ⁽¹⁾	508 – 1,216 affected per year (1900 – 2010). Average of 2-8 deaths ⁽²⁾	No data	Average damages: €23,500 to €87,000 per event ⁽²⁾ Compensation for damages to farmers €30.8 million, (€5 million/y) ⁽³⁾	Range of damage reflects impacts on general versus unspecified (larger) event ⁽²⁾	1900 – 2010 ⁽²⁾ 1999 – 2004 ⁽³⁾
Future risk	82,000 m ³ projected to be inundated (level rise: 0.5m) and 185,000m ³ (sea level rise: 1m) ⁽²⁾	No data	No data	Damages to housing and tourism estimated at €348 million €631million ⁽²⁾ (undiscounted; at 1% discount rate the PV damages are €142m and €258m and at 3% discount rate are €24 million and €44 million)	For 0.5m sea level rise ⁽²⁾ For 1m sea level rise ⁽²⁾	2100 ⁽²⁾
References: ¹ MEECC (2012); ² Bank of Greece (2011); ³ GHK (2006)						
Estimated investment need to cover increases in risk into the future		€8.48 – €74.4 million per year needed to raise level of breakwaters and protect coastal systems, avoiding 60-70% of the impact of climate change (€209 billion to €442 billion)				
Year	Investments needed	Assumptions and caveats:				
2025 – 2070	€3,346 million (€1,864 million until 2050 and €1,482 million until 2070)	Expenditure for protection of coastal systems. Damages to housing and tourism until 2100 €348 billion (0.5 m sea level rise) to €631 billion (1m sea level rise). 60% to 70% of the impact of climate change is avoided (€209 billion to €442 billion). Very high benefit-cost ratios based on information given, however it is not				

GREECE		Between 2002 and 2013, for the 22 floods recorded the total direct costs were €4,500 million (damages only available for 5 out of 22 floods, damages extrapolated across all 22 floods). The average cost per flood was €200 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
		clear that costs and benefits can be directly compared Expenditure for raising the level of breakwaters in ports. All values are totals, not annual estimates			
2025 – 2050	€600 million (assumed undiscounted: €3.95 billion)				
References: Bank of Greece (2011)					
Project	Investment made	EU funds	Funding source	Other sources	
Re-arrangement of Eshatia river bed from Iliou square to the junction with the Efpiridon pipeline	€84 million (2013)	€71 million	ERDF through the priority “Protection and management of environmental risk”	No data	
References: European Commission (2013)					
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits
Re-arrangement of Eshatia river bed from Iliou square to the junction with the Efpiridon pipeline	Western Attica region following the Eshatia river through the suburbs of Ilion, Agioi Anargyroi, Kamatero and Fyli	No data	No data	No data	116,000 local residents expected to benefit from flood protection, implementation of project expected to create 712 jobs
References: European Commission (2013)					
Project	Grey	Green	Soft	Planned or delivered	
Re-arrangement of Eshatia river bed from Iliou square to the junction with the Efpiridon pipeline	3,300 metre anti-flood culvert	A small stream is being constructed on top of the culvert, on both sides of which will be green areas, trails and bike paths	None reported	Planned	
References: European Commission (2013)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Re-arrangement of Eshatia river bed from Iliou square to the	None reported	Includes reconstruction of public	None reported	None reported	None reported

GREECE		Between 2002 and 2013, for the 22 floods recorded the total direct costs were €4,500 million (damages only available for 5 out of 22 floods, damages extrapolated across all 22 floods). The average cost per flood was €200 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
junction with the Epiridon pipeline		services including water supply, sanitation and storm-water networks			
References: European Commission (2013)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
-	-
Assumptions and caveats: Category assignment based on RPA's own classifications	

No resource efficiency support programmes were identified in Greece during the course of this study.

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	139,529	
SMEs taking actions to improve resource efficiency		
	EL	EU28
Measures to save energy	69%	67%
Measures to minimise waste	41%	67%
Measures to save water	54%	51%
Measures to save materials	68%	59%
Many measures	25%	35%
No measures	7%	6%
Comprehensive systems for energy efficiency	4%	4.26%
Benefitting from public support for measures	5%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	10,627	18,978	25,875	13,667
Energy savings (kwh/year)	464,895	524,868	17,392	293,801
CO2 savings (tonnes/year)	355	211	7	104
Savings in waste (tonnes/year)	8	30	1,778	198
Savings in raw materials (tonnes/year)	72	23,417	562	979
Savings in waste (m ³ /year)	17	380	3	12

Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses> accessed on 31 January 2014

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	Unavailable	Unavailable	Unavailable	Unavailable
<i>Breakdown by category:</i>				
Protection of ambient air and climate	Unavailable	Unavailable	Unavailable	Unavailable
Wastewater management	Unavailable	Unavailable	Unavailable	Unavailable
Waste management	Unavailable	Unavailable	Unavailable	Unavailable
Protection and remediation of soil, groundwater and surface water	Unavailable	Unavailable	Unavailable	Unavailable
Noise and vibration abatement	Unavailable	Unavailable	Unavailable	Unavailable
Protection of biodiversity and landscapes	Unavailable	Unavailable	Unavailable	Unavailable
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	Unavailable	Unavailable	Unavailable	Unavailable

Source: no data have been identified at DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.

Notes: Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data may be available, but are not reported here to avoid mixing data sources. Data from two or more Member

Environmental expenditure for latest year for which data are available (€ million)		
States may not necessarily be comparable		
Category	2011	EU average for 2011
Public environmental expenditure as percentage of total public expenditure	Unavailable	1.34%
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014	
Total environmental expenditure as percentage of GDP	2011	EU average for 2011
	Unavailable	2.26%
		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
	2011	EU total for 2011
Number of jobs in the environmental goods and services sector (1000s)	Data not available	4,194
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Eco-Innovation fund⁽¹⁾; INTERREG IVC⁽²⁾; Life+⁽³⁾; European funds (ERDF, CF & IPA)⁽⁴⁾; The European Fisheries Fund⁽⁵⁾; The European Agricultural Fund for Rural Development⁽⁶⁾</p> <p>Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-projects.eu/eco/page/Page.jsp on 1 December 2013. ² INTERREG IVC (nd): Approved Projects Database, accessed at: http://www.interreg4c.eu/projects/ on 29 November 2013. ³ Information sourced from Life Programme country factsheets available via</p>

Environment related EU funding	
	<p>the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014.</p> <p>⁴ European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_r eg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ⁵ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁶ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

Hungary				Between 2002 and 2013, for the 10 floods recorded the total direct costs were €2,700 million (damages only found for 5 out of 10 floods, damages extrapolated across all 10 floods). The average cost per flood was €270 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€48 ⁽¹⁾	No data	No data	4,370 homes were damaged, about 2,000 people had to be evacuated ⁽⁵⁾
2003	N/Q	No data	No data	25 houses flooded, 150 people displaced ⁽⁶⁾
2004	N/Q	No data	No data	384 people affected, 9 homeless ⁽¹⁾
2005	€39 ⁽¹⁾	2 ⁽⁸⁾	4 ⁽⁸⁾	30 houses has been flooded in Mád, damage is estimated to be around 100 000 000 HUF ⁽⁷⁾
2006	€519 ⁽²⁾	No data	No data	
2009	N/Q	No data	No data	
2010	€719 ⁽³⁾	1 ⁽¹⁾	No data	At least 317 houses damaged or completely destroyed, 5,259 people forced to leave their houses ⁽³⁾
2013	€28 ⁽⁴⁾	No data	No data	1,570 inhabitants forced to leave their houses ⁽⁴⁾
References and sources of information: ¹ CRED (nd); ² Ministry of Local Government and Regional Development of Hungary (2006); ³ Hungarian Ministry of Interior (2010); ⁴ Ministry of the Interior of Hungary (2013); ⁵ ICPDR (2006); ⁶ DFO (nd); ⁷ index.hu (2005); ⁸ index.hu (2005a)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, €38 million was received from the EU Solidarity Fund Total direct damages were €1,266 million 3 applications were received and 1 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2006	€519	€15	Major flooding	
2010	€719	€22	Major flooding	
2013	€28	Rejected	Regional flooding	
References: Inforegio (2013); European Commission (2012)				
Investments made				Period of expenditure not stated. €6.2 million spent on Vásárhelyi Plan and €13 million per year was spent on other flood control. No data on contribution from EU funds

Hungary				Between 2002 and 2013, for the 10 floods recorded the total direct costs were €2,700 million (damages only found for 5 out of 10 floods, damages extrapolated across all 10 floods). The average cost per flood was €270 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:		
Not stated ⁽¹⁾	€6.2			Vásárhelyi Plan		
	€13 per year			Other flood control		
References: GHK (2006)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	Excess water potentially could affect about 50% of the territory Almost 25% of territory is at risk of floods from river sections protected by dams Flash floods potentially endanger 10% of the territory	No data	No data	No data	No data	Not specified
Future risk	No data	No data	No data	No data	No data	No data
References: ICPDR (2012)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Sustainable use and management of rehabilitation of flood plain in the Middle Tisza District	€1,399,116 (2003-2007)	€691,508	LIFE III	None		
References: DG Environment (2009)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
Sustainable use and management of rehabilitation of flood plain in the Middle Tisza District	Floodplain of the River Tisza at Vezensy	No data	No data	No data	Establishment of new job opportunities	
References: DG Environment (2009)						
Project	Grey	Green	Soft	Planned or delivered		
Sustainable use and management of rehabilitation of flood plain in the Middle Tisza District	Clack valves and a culvert were constructed	Habitat restoration (forest restoration and destruction of alien species), clay pit restoration, flood plain	None reported	Delivered		

Hungary		Between 2002 and 2013, for the 10 floods recorded the total direct costs were €2,700 million (damages only found for 5 out of 10 floods, damages extrapolated across all 10 floods). The average cost per flood was €270 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
		channels were excavated, etc.			
References: DG Environment (2009)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Sustainable use and management of rehabilitation of flood plain in the Middle Tisza District	Wetland habitats and spawning ponds were created for the river's fish population	None reported	None reported	None reported	None reported
References: DG Environment (2009)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
2	-
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Egy Mozdulay				x		x										
Green Days				x												
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and Resource Efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	557,687	
SMEs taking actions to improve resource efficiency		
	HU	EU28
Measures to save energy	71%	67%
Measures to minimise waste	46%	67%
Measures to save water	52%	51%
Measures to save materials	53%	59%
Many measures	17%	35%
No measures	6%	6%
Comprehensive systems for energy efficiency	2%	4.26%
Benefitting from public support for measures	7%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	7,758	13,856	18,891	9,978
Energy savings (kwh/year)	300,451	339,211	11,240	189,877
CO2 savings (tonnes/year)	229	136	4	67
Savings in waste (tonnes/year)	7	25	1,449	161
Savings in raw materials (tonnes/year)	53	17,096	410	714
Savings in water (m ³ /year)	12	282	2	9
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	390	982	44.16%	Unavailable
<i>Breakdown by category:</i>				
Protection of ambient air and climate	1.45	92.8	-19.9%	36.6%
Wastewater management	98.9	456	31.2%	7.92%
Waste management	91.3	289	-6.03%	-3.81%
Protection and remediation of soil, groundwater and surface water	30.2	53.8	105%	-22.5%
Noise and vibration abatement	8.69	18.4	1107%	108%

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Protection of biodiversity and landscapes	13	4.57	-41.7%	-60.9%
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	19.7	67.3	16.8%	-22.2%
<p>Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.</p> <p>Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).</p> <p>Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable</p>				
Category	2011		EU average for 2011	
Public environmental expenditure as percentage of total public expenditure	0.79%		1.34%	
	<p>Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014</p>			
	2011		EU average for 2011	
Total environmental expenditure as percentage of GDP	1.94%		2.26%	
	<p>Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014</p> <p>Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)</p>			

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2011	EU total for 2011
		26.7
Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014.		
Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets		

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: INTERREG IVC⁽¹⁾; Life+⁽²⁾; European funds (ERDF, CF & IPA)⁽³⁾; The European Fisheries Fund⁽⁴⁾; The European Agricultural Fund for Rural Development⁽⁵⁾</p> <p>Sources: ¹ INTERREG IVC (nd): Approved Projects Database, accessed at: http://www.interreg4c.eu/projects/ on 29 November 2013. ² Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ³ European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ⁴ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁵ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

Ireland				Between 2002 and 2013, for the 16 floods recorded the total direct costs were €1,500 million (damages only found for 10 out of 16 floods, damages extrapolated across all 16 floods). The average cost per flood was €92 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€87 ⁽¹⁾	No data	No data	291 properties flooded ⁽²⁾
2003	N/Q	No data	No data	1 house flooded ⁽²⁾
2004	€38 ⁽¹⁾	No data	No data	Commercial premises were flooded and roads closed ⁽²⁾
2005	N/Q	No data	No data	3 houses flooded ⁽²⁾
2006	N/Q	No data	No data	17 properties flooded ⁽²⁾
2008	€96 ⁽¹⁾	No data	No data	53 houses were flooded ⁽²⁾
2009	€521 ⁽³⁾	No data	No data	1,500 people evacuated ⁽⁴⁾
2011	€127 ⁽¹⁾	2 ⁽⁵⁾	No data	An estimated 600 people were affected ⁽⁵⁾
2012	€54 ⁽¹⁾	No data	No data	Widespread power cuts, Douglas village under a metre of water ⁽⁶⁾
References and sources of information: ¹ Pers. Comm. Mark Adamson 10/12/13; ² Flood Relief & Risk Management Division, Engineering Services, Office of Public Works (2012); ³ Department of Finance, Ireland (2009); ⁴ DFO (nd); ⁵ CRED (nd); ⁶ BBC News (2012)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity Fund				Between 2002 and 2013, €13 million was received from the EU Solidarity Fund. Total direct damages were €28 million. 1 application was accepted
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2009	€28	€13	Regional flooding	
References: Inforegio (2013); European Commission (2012)				
Investments made				Between 2002 and 2013, €603 million was invested in flood risk management measures (not including the planned €45 million per year investment from 2012-2016 for continued flood risk management and mitigation), equivalent to €55 million per year on average. €153 million was from EU funds (but not all of this total may have been used for flood risk management)

Ireland				Between 2002 and 2013, for the 16 floods recorded the total direct costs were €1,500 million (damages only found for 10 out of 16 floods, damages extrapolated across all 16 floods). The average cost per flood was €92 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:		
2002	€7.5 ⁽¹⁾	No data	No data	3 projects		
2003	€3.2 ⁽¹⁾	No data	No data	3 projects		
2005	€46 ⁽¹⁾	No data	No data	2 projects		
2008	€14 ⁽¹⁾	No data	No data	2 projects		
2009	€6.9 ⁽¹⁾	No data	No data	2 projects		
2010	€33 ⁽¹⁾	No data	No data	2 projects		
2011	€26 ⁽¹⁾	No data	No data	4 projects		
	€8.8 ⁽²⁾	No data	No data	Administration		
	€0.8 ⁽²⁾	No data	No data	Purchase of plant and machinery		
	€0.9 ⁽²⁾	No data	No data	Hydrometric and hydrological investigation and monitoring		
	€31 ⁽²⁾	No data	No data	Flood risk management		
	€16 ⁽²⁾	No data	No data	Drainage maintenance		
	€57 ⁽²⁾	No data	No data	Total		
2012	€27 ⁽¹⁾	No data	No data	2 projects		
	€8.7 ⁽²⁾	No data	No data	Administration		
	€0.5 ⁽²⁾	No data	No data	Purchase of plant and machinery		
	€1.0 ⁽²⁾	No data	No data	Hydrometric and hydrological investigation and monitoring		
	€45 ⁽²⁾	No data	No data	Flood risk management		
	€18 ⁽²⁾	No data	No data	Drainage maintenance		
	€71 ⁽²⁾	No data	No data	Total		
2013	€29 ⁽¹⁾	No data	No data	4 projects		
2012-2016	€45 per year ⁽³⁾	No data	No data	Continued funding for flood risk management and mitigation, capital programme		
2007-2013	-	€153 ⁽⁴⁾	Cohesion Fund	Protecting the environment, promoting sustainable growth and combating the effects of climate change. Limited/no data on specific allocation from other funds		
References: ¹ Anon (nd); ² Ireland Stat (nd); ³ Department of Public Expenditure and Reform (2011); ⁴ European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	300 locations known to be at risk of flooding ⁽¹⁾	No data	No data	Estimated average annual damages per location from current studies range from €250,000 to €2.6 million, with a mean value of €1.1 million.	Not specified	Not specified ⁽¹⁾

Ireland				Between 2002 and 2013, for the 16 floods recorded the total direct costs were €1,500 million (damages only found for 10 out of 16 floods, damages extrapolated across all 16 floods). The average cost per flood was €92 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
				Assuming typical value of €250,000 per site and 300 locations gives national annual average damages of €75 million ⁽¹⁾		
	20% of Ireland's coast is at risk of erosion and 40% of the Wexford coast is vulnerable and needs protection ⁽²⁾	No data	No data	No data	Not specified	Not specified ⁽²⁾
Future risk	No data	No data	No data	No data	No data	No data
References: ¹ Office of Public Works (OPW) (2004); ² Policy Research Corporation (2009)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Greater Dublin Strategic Drainage Study. River Tolka	€32.3 million (€100,000 per year maintenance costs)	None	Local Authorities, OPW, DoEHLG, NRA, Developers and local landowners	None		
References: Dublin City Council (nd)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
Greater Dublin Strategic Drainage Study. River Tolka	Areas along the River Tolka	Costs of traffic disruption and associated time lost due to floods	€34.5 million	1.06	No data	
References: Dublin City Council (nd)						
Project	Grey	Green	Soft	Planned or delivered		
Greater Dublin Strategic Drainage Study. River Tolka	Construction of embankments and culverts. Widening and deepening of river channels	No data	A more effective flood forecasting system relying on linking weather radars, rainfall stations, river/tidal gauging stations and eyewitness accounts	Probably delivered*		

Ireland	Between 2002 and 2013, for the 16 floods recorded the total direct costs were €1,500 million (damages only found for 10 out of 16 floods, damages extrapolated across all 16 floods). The average cost per flood was €92 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)				
References: Dublin City Council (nd)					
Assumptions and caveats: *Information relates to plans, the timescales for which have now passed					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Greater Dublin Strategic Drainage Study. River Tolka	None reported	None reported	None reported	None reported	Potential damage to aquatic and riparian habitats due to channel widening and deepening
References: Dublin City Council (nd)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
9	8
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME Support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Business Process Improvement – GreenPlus assignments									x							
Cleaner Greener Production Programme									x							
Ecocert		x	x		x		x							x		

SME Support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Envirocentre.ie website				X												
Environmental and Clean Energy Innovation Fund									X							
Green Business Initiative			X		X		X	X			X			X		
Green Hospitality Programme			X		X	X				X	X					
Green Plus			X						X	X						X
Green Plus Assignments									X							
Green Start			X	X						X				X		X
Green Transform									X							
GreenTech Support									X							
SMILE ('Saving Money through Industrial Linkages and Exchanges')								X			X	X				
Technical Feasibility Grants									X							
SME Programme			X		X	X		X	X	X				X		
Green Seafood Business			X	X	X			X		X	X			X		
The Business to Business (B2B) Green Mentors Programme											X	X	X			
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	142,618	
SMEs taking actions to improve resource efficiency		
	IE	EU28
Measures to save energy	62%	67%
Measures to minimise waste	77%	67%
Measures to save water	43%	51%
Measures to save materials	46%	59%
Many measures	37%	35%
No measures	0%	6%
Comprehensive systems for energy efficiency	3%	4.26%
Benefitting from public support for measures	2%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	5,653	10,096	13,764	7,270
Energy savings (kwh/year)	636,213	718,287	23,801	402,070
CO2 savings (tonnes/year)	486	289	9	142
Savings in waste (T/year)	19	67	3,940	439
Savings in raw materials (T/year)	38	12,457	299	521
Savings in water (m ³ /year)	170	3916	35	122
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	Unavailable	Unavailable	Unavailable	Unavailable
<i>Breakdown by category:</i>				
Protection of ambient air and climate	Unavailable	Unavailable	Unavailable	Unavailable
Wastewater management	Unavailable	Unavailable	Unavailable	Unavailable
Waste management	Unavailable	Unavailable	Unavailable	Unavailable
Protection and remediation of soil, groundwater and surface water	Unavailable	Unavailable	Unavailable	Unavailable
Noise and vibration abatement	Unavailable	Unavailable	Unavailable	Unavailable
Protection of biodiversity and landscapes	Unavailable	Unavailable	Unavailable	Unavailable
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable

Environmental expenditure for latest year for which data are available (€ million)				
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	Unavailable	Unavailable	Unavailable	Unavailable
Source: no data identified for Ireland from DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014				
Note: Collection of environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable				
Category	2011		EU average for 2011	
Public environmental expenditure as percentage of total public expenditure	Unavailable		1.34%	
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014			
Total environmental expenditure as percentage of GDP	2011		EU average for 2011	
	Unavailable		2.26%	
		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)		

Environmental employment			
Number of jobs in the environmental goods and services sector (1000s)	2011		EU total for 2011
	Unavailable		4,194
Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014.			
Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets			

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Life+⁽¹⁾; European funds (ERDF, CF & IPA)⁽²⁾; The European Agricultural Fund for Rural Development⁽³⁾</p> <p>Sources: ¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ² European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ³ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

Italy				Between 2002 and 2013, for the 20 floods recorded the total direct costs were €11,000 million (damages only found for 16 out of 20 floods, damages extrapolated across all 20 floods). The average cost per flood was €560 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€2,131 ⁽¹⁾	2 ⁽²⁾	20 ⁽²⁾	After six months some 155 families in Lombardia had still not returned to their homes ⁽¹⁾
2003	€2,184 ⁽³⁾	9 ⁽³⁾	No data	An estimated 1,350 were directly affected by floods ⁽²⁾
2004	€223 ⁽⁵⁾	2 ⁽²⁾	No data	230 ha of agricultural land was destroyed ⁽⁴⁾
2005	N/Q	6 ^(4, 6)	22 ⁽⁶⁾	There was damage to agricultural crops and electrical works ⁽⁶⁾
2006	€466 ⁽⁷⁾	No data	No data	
2007	€161 ⁽⁷⁾	No data	No data	
2008	€1 ⁽⁷⁾	13 ⁽⁷⁾	No data	Approximately 300 people were affected in 2008 ⁽²⁾
2009	€811 ^(8, 9)	37 ⁽⁸⁾	122 ⁽⁸⁾	Some 2,019 people were evacuated and 14,500 suffered direct damage or consequences to their health, lost goods or suffered economic damage ⁽⁸⁾
2010	€995 ⁽¹⁰⁾	6 ⁽⁷⁾	No data	Half a million people were left without drinking water ⁽⁴⁾
2011	€722 ⁽¹¹⁾	13 ⁽¹¹⁾	No data	605 businesses suffered documented damages and others could not get to their place of work due to flooding ⁽¹¹⁾
2012	€1,205 ⁽⁷⁾	10 ⁽⁷⁾	No data	500 people were affected by flooding and 700 left homeless ⁽²⁾
2013	€25 ⁽¹²⁾	18 ⁽¹²⁾	No data	1,700 people evacuated ⁽¹²⁾
References and sources of information: ¹ Italian Government (2002); ² CRED (nd); ³ Lastoria B et. al. (2006); ⁴ DFO (nd); ⁵ Regione Autonoma della Sardegna (2004); ⁶ Mossa M (2007); ⁷ Berti D et. al. (2012); ⁸ Dipartimento della Protezione Civile (2009); ⁹ Tuscany Region (2009); ¹⁰ Italian Government (2010); ¹¹ Liguria and Tuscany Region through the Italian National Department of Civil Protection (2011); ¹² Mackenzie J & O'Leary N (2013)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity Fund				Between 2002 and 2013, €35 million was received from the EU Solidarity Fund. Total direct damages were €4,857 million. 7 applications were received and 5 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2003	€1,900	Rejected	Regional flooding (North Italy)	

Italy				Between 2002 and 2013, for the 20 floods recorded the total direct costs were €11,000 million (damages only found for 16 out of 20 floods, damages extrapolated across all 20 floods). The average cost per flood was €560 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2003	€525	Rejected	Regional flooding (Friuli Venezia-Giulia)	
2004	€223 (over-estimate)	Rejected	Regional flooding Sardinia	
2009	€599	Rejected	Regional (Messina mudslide combined with flooding)	
2010	€212	Rejected	Regional flooding (Tuscany)	
	€676	€17	Regional flooding (Veneto)	
2011	€723	€18	Regional flooding (Liguria and Tuscany)	
References: Inforegio (2013); European Commission (2012)				
Investments made				Between 1998 and 2015, €5,600 million will be invested in flood risk management measures (excluding total expenditure on coastal erosion. Between 2002 and 2013 €1,000 million was invested). Equivalent to €260 million per year on average. No data on EU fund contribution
Year	Investments made (€million)	EU funds received	EU funds	Assumptions and caveats:
1998-2015	€4,600 ⁽¹⁾	No data	No data	Total expenditure on coastal protection (flooding and erosion).
Up to 2006	€447 ⁽²⁾	No data	No data	Urgent preventative measures
Not specified	€150 ⁽³⁾	No data	No data	Allocation of preventative measures at national level against flash floods.
Not specified	€50 ⁽³⁾	No data	No data	Cost of maintenance of existing protection.
2008	€380 ⁽¹⁾	No data	No data	Total expenditure on coastal protection (flooding and erosion). MOSE project in Venice accounts for more than 90% of total spend at an estimated €3.5 billion
References: ¹ Policy Research Corporation (2009); ² MELS (2007); ³ SCCV (2007)				

Italy		Between 2002 and 2013, for the 20 floods recorded the total direct costs were €11,000 million (damages only found for 16 out of 20 floods, damages extrapolated across all 20 floods). The average cost per flood was €560 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)				
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	No data	3.5 million people (6% of population) at risk of flooding and mudslides ⁽¹⁾	No data	No data	Not specified	Not specified ⁽¹⁾
	Area with highest risk of flooding is 7,774km ² or 2.6% of the national territory ⁽²⁾	No data	No data	No data	Not specified	Not specified ⁽²⁾
	The major coastal areas at risk of sea flooding are the Padano-Venetian, Versilia, Fondi and Pontina Plains ⁽³⁾	No data	No data	Value of agricultural land at risk from hydrological flooding: €103 million in Lombardy, Latium and Calabria ⁽³⁾	No data	Not specified ⁽³⁾
	Estimated that 60% of the country is at risk of flooding ⁽⁴⁾	No data	No data	No data	No data	Not specified ⁽⁴⁾
Future risk	No data	No data	No data	Damage from climate change for Fondi Plan (Latium) and river Sangro plan (Abrezzo) coastal regions of about €14 million ⁽⁵⁾	No data	2011 ⁽⁵⁾
References: ¹ Mysiak (2013); ² Ministero dell'Ambiente (2000); ³ MELS (2007); ⁴ SCCV (2007); ⁵ Breil et al (2007) in MELS (2007)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Risk reduction and environmental rehabilitation of the Sarno River, Campania	€217.5 million	€150.6 million	European Regional Development Fund	No data		

Italy		Between 2002 and 2013, for the 20 floods recorded the total direct costs were €11,000 million (damages only found for 16 out of 20 floods, damages extrapolated across all 20 floods). The average cost per flood was €560 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
References: European Commission (2014)					
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits
Risk reduction and environmental rehabilitation of the Sarno River, Campania	Sarno River basin	No data	900,000 people benefiting from reduced flood risk; 240 jobs expected to be created	No data	No data
References:					
Project	Grey	Green	Soft	Planned or delivered	
Risk reduction and environmental rehabilitation of the Sarno River, Campania	Construction and hydraulic works, construction of storage reservoirs and adaptation of existing reservoirs	Environmental rehabilitation along the river banks and canal network; construction of flood control areas	Monitoring and civil protection measures	Delivered by June 2015	
References: European Commission (2014)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Risk reduction and environmental rehabilitation of the Sarno River, Campania	Rehabilitation of river banks; creation of new flood control areas could improve habitat value ⁽¹⁾	Storage of water plus opportunity for water purification during storage ⁽¹⁾	Flooding could improve local soil quality, although high levels of pollutants in the river could reduce soil quality ⁽²⁾	None reported	Flood risks reduced in an area that has been regularly flooded over 20 years ⁽¹⁾
References: ¹ based on European Commission (2014); ² based on Albanese S et al (2012)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
2	3
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME Support Programmes Identified and Services Provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Eco Step		x	x		x					x	x	x		x		x
EIB and the Intesa Sanpaolo Group									x							
Giada Project				x						x	x					x
Innovhub Milano				x							x					
TREND (Tecnologia e innovazione per il Risparmio e l'efficienza ENergetica Diffusa)			x						x							
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	3,688,347	
SMEs taking actions to improve resource efficiency		
	IT	EU28
Measures to save energy	44%	67%
Measures to minimise waste	65%	67%
Measures to save water	32%	51%
Measures to save materials	40%	59%
Many measures	19%	35%
No measures	9%	6%
Comprehensive systems for energy efficiency	4%	4.26%
Benefitting from public support for measures	5%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	14,375	25,673	35,002	18,488
Energy savings (kwh/year)	373,884	422,117	13,987	236,285
CO2 savings (tonnes/year)	285	170	6	84
Savings in waste (tonnes/year)	12	41	2,440	272
Savings in raw materials (tonnes/year)	98	31,678	760	1,324
Savings in water (m ³ /year)	24	562	5	18

Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses> accessed on 31 January 2014

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	13,860	22,464	5.08%	17.5%
<i>Breakdown by category:</i>				
Protection of ambient air and climate	Unavailable	2039	Unavailable	-20.1%
Wastewater management	732	1934	-15.1%	35%
Waste management	7312	12776	21.4%	26.9%
Protection and remediation of soil, groundwater and surface water	Unavailable	Unavailable	Unavailable	Unavailable
Noise and vibration abatement	Unavailable	Unavailable	Unavailable	Unavailable
Protection of biodiversity and landscapes	1770	Unavailable	-0.06	Unavailable
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	4045	5714	-0.08	0.13

Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.

Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).

Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not

Environmental expenditure for latest year for which data are available (€ million)		
included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable		
Category	2011	EU average for 2011
Public environmental expenditure as percentage of total public expenditure	1.76%	1.34%
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014	
Category	2011	EU average for 2011
Total environmental expenditure as percentage of GDP	3.71%	2.26%
	Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014	Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
Category	2011	EU total for 2011
Number of jobs in the environmental goods and services sector (1000s)	Unavailable	4,194
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	Funding received from the following sources: Eco-Innovation fund ⁽¹⁾ ; INTERREG IVC ⁽²⁾ ; Life+ ⁽³⁾ ; European funds (ERDF, CF & IPA) ⁽⁴⁾ ; The European Fisheries Fund ⁽⁵⁾ ; The European Agricultural Fund for Rural Development ⁽⁶⁾
	Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-

Environment related EU funding

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1.3.1 References

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1.1 Financial, economic and social costs of floods

LATVIA				Between 2002 and 2013, for the 1 flood recorded the total direct costs were €2.9 million. The average cost per flood was €2.9 million. Note this only includes floods that exceed the thresholds for inclusion in the EM-DAT database, many floods have occurred but it is unclear whether these exceed the thresholds as no quantified data were available		
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)		
2005	€2.9 ⁽¹⁾	No data	No data	Extensive flooding in Riga prompted the military to evacuate people from the capital ⁽²⁾		
References and sources of information: ¹ Carpenter (2005); ² Haanpää et al (2006)						
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline. As noted above, many floods have occurred but these have not been included as there were no data suggesting these exceeded the thresholds used for identifying what counts as a flood within this study for consistency across Member States; costs have not been normalised						
EU Solidarity fund				Between 2002 and 2013, no applications for EU Solidarity fund were made		
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats:		
No applications						
References: Inforegio (2013); European Commission (2012)						
Investments made				Between 1998 and 2015, €141 million was invested in flood risk management measures, equivalent to € 8 million per year on average. €1 billion was from EU funds (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:		
1998-2015	1.4 ⁽¹⁾	No data	No data	Total expenditure on coastal protection (flooding and erosion) ⁽¹⁾		
2008	0.06 ⁽¹⁾	No data	No data			
2008-2015	70 ⁽²⁾	No data	No data	Programmed for prevention and reduction of flood risks ⁽²⁾		
	48 ⁽²⁾	No data	No data			
	22 ⁽²⁾	No data	No data			
2007-2013	-	1,000 ⁽³⁾	Cohesion Fund	Improving the environment, promoting sustainable growth and combating climate change ⁽³⁾ . Limited/no data on specific allocation from other funds		
References: ¹ Policy Research Corporation (2009); ² Minister for the Environment (2007); ³ European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	200,000 ha of flood area or 3% of national territory. This includes	River Venta: 76,807 residents	No data	No data	Not specified	Not specified

LATVIA		Between 2002 and 2013, for the 1 flood recorded the total direct costs were €2.9 million. The average cost per flood was €2.9 million. Note this only includes floods that exceed the thresholds for inclusion in the EM-DAT database, many floods have occurred but it is unclear whether these exceed the thresholds as no quantified data were available				
	agricultural land, residential areas with comparatively large population density and infrastructure, including large hydrotechnic structures ⁽¹⁾	River Lielupe: 118,906 residents River Daugava: 387,201 residents River Gauja: 33,394 residents ⁽¹⁾				
	Approx. 33% of the coastline is subject to erosion ⁽²⁾					
Future risk	No data	No data	No data	No data	No data	No data
References: ¹ Minister for the Environment (2007); ² Policy Research Corporation (2009)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
HydroClimateStrategyRiga – Integrated Strategy for Riga City to Adapt to the Hydrological Processes Intensified by Climate Change Phenomena	€662,240 (2010 to 2012)	€329,270	LIFE+	Riga County Council		
References: Life Programme (nd)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
HydroClimate StrategyRiga – Integrated Strategy for Riga City to Adapt to the Hydrological Processes Intensified by Climate Change Phenomena	Kurzeme, Latgale, Riga, Pieriga, Vidzeme, Zemgale, Extra-Regio, Associated Latvia	None	None	No data	Provides solutions to prevent the negative effects of flooding	
References: Life Programme (nd)						
Assumptions and caveats:						
Project	Grey	Green	Soft	Planned or delivered		
HydroClimate StrategyRiga – Integrated Strategy for Riga City to Adapt to the Hydrological Processes Intensified by Climate Change Phenomena	None reported	None reported	Provision of a flood risk management plan for Riga City and implementation of public awareness events	Delivered		
References: Life Programme (nd)						

LATVIA		Between 2002 and 2013, for the 1 flood recorded the total direct costs were €2.9 million. The average cost per flood was €2.9 million. Note this only includes floods that exceed the thresholds for inclusion in the EM-DAT database, many floods have occurred but it is unclear whether these exceed the thresholds as no quantified data were available			
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
HydroClimate StrategyRiga – Integrated Strategy for Riga City to Adapt to the Hydrological Processes Intensified by Climate Change Phenomena ⁽¹⁾	None reported				

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
1	-
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
High Value Added Investments 3rd call								x	x	x		x				
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	73,909	
SMEs taking actions to improve resource efficiency		
	LV	EU28
Measures to save energy	73%	67%
Measures to minimise waste	49%	67%
Measures to save water	51%	51%
Measures to save materials	61%	59%
Many measures	18%	35%
No measures	9%	6%
Comprehensive systems for energy efficiency	6%	4.26%
Benefitting from public support for measures	6%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	5,254	9383	12,792	6,757
Energy savings (kwh/year)	195,301	220,496	7,306	123,425
CO2 savings (tonnes/year)	149	89	3	44
Savings in waste (tonnes/year)	3	10	574	64
Savings in raw materials (tonnes/year)	36	11,577	278	484
Savings in water (m ³ /year)	29	659	6	21
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2010		Change between 2008 and 2010	
	Public	Private	Public	Private
Total	140.4	84.45	-30.23%	-53.31%
<i>Breakdown by category:</i>				
Protection of ambient air and climate	7.34	11.87	-83.02%	-29.26%
Wastewater management	8.61	51	-90.08%	-56.39%
Waste management	65.9	7.23	92.13%	-65.67%
Protection and remediation of soil, groundwater and surface water	Unavailable	9.11	Unavailable	64.14%
Noise and vibration abatement	Unavailable	Unavailable	Unavailable	Unavailable

Environmental expenditure for latest year for which data are available (€ million)				
Protection of biodiversity and landscapes	3.53	2.44	-81.90%	10.91%
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	54.89	2.8	210.64%	-84.72%
Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.				
Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).				
Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable				
Category	2010		EU average for 2010	
Public environmental expenditure as percentage of total public expenditure	1.79%		1.38%	
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014			
Total environmental expenditure as percentage of GDP	2010		EU average for 2010	
	1.48%		2.30%	
	Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014;		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)	
	GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014			

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2009	EU total for 2009
		23
Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets		

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Life+⁽¹⁾; European funds (ERDF, CF & IPA)⁽²⁾; The European Fisheries Fund⁽³⁾; The European Agricultural Fund for Rural Development⁽⁴⁾</p> <p>Sources: ¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ² European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_r eg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ³ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁴ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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- SBA Fact Sheets (2012): SBA Country Fact Sheets, European Commission, accessed at: <http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/> on 26 November 2013.
- SBA Fact Sheets (2013): SBA Country Fact Sheets, European Commission, accessed at: <http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/> on 31 January 2014.

1.1 Financial, economic and social costs of floods

LITHUANIA				Between 2002 and 2013, for the 5 floods recorded, no quantified costs have not been found. Note this only includes floods that exceed the thresholds for inclusion in the EM-DAT database, many floods have occurred but it is unclear whether these exceed the thresholds as no quantified data were available
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2005	N/Q	No data	No data	Widespread power cuts ^(2, a)
2007	N/Q	No data	No data	
2010	N/Q	4 ⁽¹⁾	No data	Around 130 properties, 200 cars and 150 livestock damaged or lost ⁽³⁾
References and sources of information: ¹ CRED (nd); ² Haanpaa S et al (2006); ³ Mullett A (2010); ⁴ Pers. Comm. (Ministry of Environment of the Republic of Lithuania)				
Assumptions and caveats: ^a Not just flooding related Only floods for which information has been found have been used, those on CRED (nd) used as a baseline. This excludes the spring floods in the Silute-Kalipeda region which occur annually and can affect a large area of land and up to 50 villages, more than 300 farmsteads and a densely populated town of 2000. Such an extreme flood would exceed the EM-DAT thresholds but no quantified data have been found beyond those included above. Impacts are also seen in roads, communication lines and other infrastructure ⁽⁴⁾ . There are also frequent winter floods during warm winters				
EU Solidarity fund				Between 2002 and 2013, no applications for EU Solidarity fund were made
Year	Total direct damage (€million)	Funds received	Reason(s) for application	Assumptions and caveats:
No applications				
References: Inforegio (2013); European Commission (2012)				
Investments made				Between 1998 and 2015, €1,118 million was invested in flood risk management measures, equivalent to €102 million per year on average. €1.1 billion was from EU funds (but not all of this total may have been used for flood risk management)
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:
2003	€0.05 ⁽¹⁾	No data	No data	Programme for Lithuanian Coastal Strip Management ⁽¹⁾
2008	€1.6 ⁽¹⁾	No data	No data	
2008-2013	€5.8 ⁽¹⁾	No data	No data	From EU funds for coastal protection ⁽¹⁾
1998-2015	€10 ⁽¹⁾	No data	No data	Total expenditure on coastal protection (flooding and erosion) ⁽¹⁾
Not specified	€3 per year ⁽²⁾	No data	No data	Programme for preparation for floods in Klaipeda Region ⁽²⁾
2007-2013	-	1,100 ⁽³⁾	Cohesion Fund	Target the effects of climate change ⁽³⁾ . Limited/no data on specific allocation from other funds
References: ¹ Policy Research Corporation (2009); ² GHK (2006); ³ European Union Cohesion Policy (nd)				

LITHUANIA		Between 2002 and 2013, for the 5 floods recorded, no quantified costs have not been found. Note this only includes floods that exceed the thresholds for inclusion in the EM-DAT database, many floods have occurred but it is unclear whether these exceed the thresholds as no quantified data were available				
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	54 sections of river where extreme events can occur. All the Baltic sea area and Curonian Lagoon coastline is at high risk of flooding. The total area at risk covers 28,000 ha of residential areas; 4,600km of roads, 193,000 ha of agricultural land and 97,000 ha of forests in tidal at risk areas	No data	No data	No data	Not specified	Not specified
Future risk						No data
References: Lithuanian Minister for the Environment (2012)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Creating Flood Emergency Response Team in Latvia and Lithuania Cross Border Region	€1,163,687 (2011-2013)	€989,133	ERDF	No data		
References: Latvia-Lithuania Programme (2008)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
Creating Flood Emergency Response Team in Latvia and Lithuania Cross Border Region	Jelgava and Siauliai	No data	No data	No data	More effective response to floods	
References: Latvia-Lithuania Programme (2008)						
Project	Grey	Green	Soft	Planned or delivered		
Creating Flood Emergency Response Team in Latvia and Lithuania Cross Border Region	Effective equipment for pumping water	None reported	Training and exchanges of information to deal with floods	Delivered		
References: Latvia-Lithuania Programme (2008)						
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks	
Creating Flood Emergency Response Team in Latvia and Lithuania Cross Border Region	None reported					
References: Latvia-Lithuania Programme (2008)						

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
0	1
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
BSR Stars Programme (Baltic Sea Region)				x				x				x				
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	115,393	
SMEs taking actions to improve resource efficiency		
	LT	EU28
Measures to save energy	61%	67%
Measures to minimise waste	34%	67%
Measures to save water	50%	51%
Measures to save materials	55%	59%
Many measures	20%	35%
No measures	17%	6%
Comprehensive systems for energy efficiency	5%	4.26%
Benefitting from public support for measures	3%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	8,374	14,955	20,389	10,770
Energy savings (kwh/year)	276,312	311,957	10,337	174,622
CO2 savings (tonnes/year)	211	126	4	62

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Savings in waste (tonnes/year)	3	9	532	59
Savings in raw materials (tonnes/year)	57	18453	443	771
Savings in water (m3/year)	8	178	2	6

Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses> accessed on 31 January 2014

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2010		Change between 2008 and 2010	
	Public	Private	Public	Private
Total	372	117	35.33%	-48.14%
<i>Breakdown by category:</i>				
Protection of ambient air and climate	10.7	48.2	19.2%	-34.5%
Wastewater management	189	30	79.7%	-56.1%
Waste management	113	28.3	13.6%	-12.7%
Protection and remediation of soil, groundwater and surface water	Unavailable	1.82	Unavailable	-57.3%
Noise and vibration abatement	Unavailable	2.52	Unavailable	2.44%
Protection of biodiversity and landscapes	11.6	0.39	-29.9%	30.0%
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	48.4	5.51	7.17%	-87.4%

Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.

Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).

Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data collection methods in Lithuania are different from those used in other Member

Environmental expenditure for latest year for which data are available (€ million)		
States, thus data may not be comparable		
Category	2010	EU average for 2010
Public environmental expenditure as percentage of total public expenditure	3.18%	1.38%
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014	
Total environmental expenditure as percentage of GDP	2.56%	2.30%
	Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014	Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
	2010	EU total for 2010
Number of jobs in the environmental goods and services sector (1000s)	Unavailable	4,087
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	Funding received from the following sources: Life+ ⁽¹⁾ ; European funds (ERDF, CF & IPA) ⁽²⁾ ; The European Fisheries Fund ⁽³⁾ ; The European Agricultural Fund for Rural Development ⁽⁴⁾
	Sources: ¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014.

Environment related EU funding	
	<p>² European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ³ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁴ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

1.4 References

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1.1 Financial, economic and social costs of floods

LUXEMBOURG				Between 2002 and 2013, there were 0 floods recorded (based on floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)		
Assumptions and caveats: there were no records of floods found for this report between 2002 and 2013						
EU Solidarity fund				Between 2002 and 2013, no applications for EU Solidarity fund were made		
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats:		
No applications						
References: Inforegio (2013); European Commission (2012)						
Investments made				€2.2 million from EU funds (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:		
2007-2013	-	€2.2	Cohesion Fund	Measures to combat climate change ⁽¹⁾ . Limited/no data on specific allocation from other funds		
References: ¹ European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	No data					
Future risk	No data					
Assumptions and caveats: No data found for Luxembourg						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Ecologically oriented flood protection in the River Sauer/Sûre in Ralingen (Germany) and Steinheim (Luxembourg) (2009-2011)	€5,915,600 ⁽¹⁾ (estimated that €2 million would be used for Ralingen, and €3.1 million in Steinheim) ⁽²⁾	€1,774,680 (30%) ⁽¹⁾	ERDF (INTERREG IV) ⁽¹⁾	Project partners ⁽¹⁾ – Commune de Rosport (LU) - Administration de la Gestion de l'eau (Water Management Agency) (LU) - Verbandsgemeinde Trier-Land (DE) - Struktur- und Genehmigungsdirektion Nord, Regionalstelle Wasserwirtschaft, Abfallwirtschaft, Bodenschutz Trier (DE)		
References: ¹ Grand-Duché de Luxembourg (2012) ; ² Ökologisch orientierter Hochwasserschutz						

LUXEMBOURG		Between 2002 and 2013, there were 0 floods recorded (based on floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
Steinheim/Ralingen (2009)					
Assumptions and caveats: This project took place in both Luxembourg and Germany					
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits
Ecologically oriented flood protection in the River Sauer/Sûre in Ralingen (Germany) and Steinheim (Luxembourg) (2009-2011)	Steinheim (Luxembourg) and Ralingen (Germany)	No data	No data	No data	Thanks to the implemented measures the specific local areas were largely spared flooding during the flood in January 2011 ⁽¹⁾
References: ¹ Ökologisch orientierter Hochwasserschutz Steinheim/Ralingen (nd)					
Project	Grey	Green	Soft	Planned or delivered	
Ecologically oriented flood protection in the River Sauer/Sûre in Ralingen (Germany) and Steinheim (Luxembourg) (2009-2011)	None reported	5 actions were taken: 1. The river bed was widened at Ralingen. 2. At Fenterwier the river was expanded by creating a new branch. 3. At Steinheim the river was expanded by re-activating the historical course. 4. At Enghien the river was expanded by creating a new branch. 5. At Minden a cross-sectional narrowing was fitted	Cooperation in disaster response, workshops for local residents	Delivered	
References: Grand-Duché de Luxembourg (2012)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Ecologically oriented flood protection in the River Sauer/Sûre in Ralingen (Germany) and Steinheim (Luxembourg) (2009-2011)	The project aimed to introduce flood control measures in as natural a manner as possible. Potentially damaging	None reported	None reported	None reported	None reported

LUXEMBOURG		Between 2002 and 2013, there were 0 floods recorded (based on floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
	measures have been omitted and existing artificial embankments were largely removed. Taking into account the hydraulic requirements of flood protection, the natural shore development and vegetation was left. Taking this approach ensured there was no impact on nature or the landscape and also the creation of new structures for floodplain flora and fauna				
References: Grand-Duché de Luxembourg (2012)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
1	-
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
3rd Action Plan for SMEs (government)									x		x	x				
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	30,433	
SMEs taking actions to improve resource efficiency		
	LU	EU28
Measures to save energy	69%	67%
Measures to minimise waste	70%	67%
Measures to save water	49%	51%
Measures to save materials	61%	59%
Many measures	32%	35%
No measures	4%	6%
Comprehensive systems for energy efficiency	10%	4.26%
Benefitting from public support for measures	8%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	20,462	36,542	49,822	26,316
Energy savings (kwh/year)	1,057,438	1,193,852	39,558	668,273
CO2 savings (tonnes/year)	807	480	16	236
Savings in waste (tonnes/year)	26	91	5,387	600
Savings in raw materials (tonnes/year)	139	45,090	1,082	1,884
Savings in water (m3/year)	417	9609	85	300
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	335	Unavailable	33.1%	Unavailable
<i>Breakdown by category:</i>				
Protection of ambient air and climate	-49.8	Unavailable	-17.6%	Unavailable
Wastewater management	276	Unavailable	27.3%	Unavailable
Waste management	75.4	Unavailable	17.5%	Unavailable
Protection and remediation of soil, groundwater and surface water	-2.09	Unavailable	-18%	Unavailable
Noise and vibration abatement	-0.52	Unavailable	-19%	Unavailable
Protection of biodiversity and landscapes	36.2	Unavailable	5.4%	Unavailable
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	Unavailable	Unavailable	Unavailable	Unavailable
<p>Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.</p> <p>Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).</p> <p>Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable</p>				
Category	2011		EU average for 2011	
Public environmental expenditure as percentage of total public expenditure	1.88%		1.34%	
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014			
Category	2011		EU average for 2011	
Total environmental expenditure as percentage of GDP	Unavailable		2.26%	
	-		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised	

Environmental expenditure for latest year for which data are available (€ million)	
	producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2011	EU total for 2011
		Unavailable
Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets		

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Life+⁽¹⁾; European funds (ERDF, CF & IPA)⁽²⁾; The European Agricultural Fund for Rural Development⁽³⁾</p> <p>Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-projects.eu/eco/page/Page.jsp on 1 December 2013. ² INTERREG IVC (nd): Approved Projects Database, accessed at: http://www.interreg4c.eu/projects/ on 29 November 2013. ³ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ⁴ European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ⁵ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁶ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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- European Commission (2012): European Union Solidarity Fund Annual Report 2011, COM(2012)523 final, Brussels 20.9.2012, accessed at: http://ec.europa.eu/regional_policy/information/reports/index_en.cfm on 1 December 2013.
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- SBA Fact Sheets (2012): SBA Country Fact Sheets, European Commission, accessed at: <http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/> on 26 November 2013.
- SBA Fact Sheets (2013): SBA Country Fact Sheets, European Commission, accessed at: <http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/> on 31 January 2014.

1.1 Financial, economic and social costs of floods

MALTA				Between 2002 and 2013, for the 13 floods the total direct costs were €390 million (damages only found for 1 out of 13 floods, damages extrapolated across all 13 floods. The average cost per flood was €30 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	N/Q	No data	No data	Damage to private properties and traffic disruption ⁽²⁾
2003	€30 ^(1, a)	No data	No data	Traffic disruption ⁽²⁾
2004	N/Q	No data	No data	Traffic disruption ⁽²⁾
2006	N/Q	No data	No data	Traffic disruptions ⁽²⁾
2007	N/Q	No data	No data	Damage to private property ⁽²⁾
2010	N/Q	No data	No data	Damage to private property ⁽²⁾
2011	N/Q	No data	No data	Damage to infrastructure ⁽²⁾
References and sources of information: ¹ Government of Malta (2003); ² Malta Resources Authority (2013)				
Assumptions and caveats: ^a Costs for storm damage including floods Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, €1.0 million was received from the EU Solidarity Fund. Total direct damages were €30 million. 1 application was received and accepted
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2003	€30	€1.0	Major flooding (and storm)	
References: Inforegio (2013); European Commission (2012)				
Investments made				Between 2002 and 2013, €181 million was invested in flood risk management measures (based on equal spending per year and €91 million invested between 1998 and 2015), equivalent to €16 million per year on average. €122 million was from EU funds (but not all of this total may have been used for flood risk management)
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:
2000-2007	€3.3 ⁽¹⁾	No data	No data	Smaller flood relief projects ⁽¹⁾
2006-2008	€0.4 ⁽¹⁾	No data	No data	Preparation of national Storm Water Master Plan project ⁽¹⁾
2008	€0.5 ⁽¹⁾	No data	No data	Smaller flood relief projects ⁽¹⁾
2009-2010	€2.1 ⁽¹⁾	No data	No data	CBA and EIA ⁽¹⁾

MALTA				Between 2002 and 2013, for the 13 floods the total direct costs were €390 million (damages only found for 1 out of 13 floods, damages extrapolated across all 13 floods. The average cost per flood was €30 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
2010-2013	€71 ⁽¹⁾	No data	No data	Infrastructural works (€56 million from EU funds) ⁽¹⁾		
1998-2015	€91 ⁽¹⁾	No data	No data	Total (across all expenditure) ⁽¹⁾		
2007-2013	-	122 ⁽²⁾	Cohesion Fund	Support for actions to mitigate the consequences of climate ⁽²⁾ . Limited/no data on specific allocation from other funds		
References: ¹ Policy Research Corporation (2009); ² European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	No data	16,700	4,520 within catchment areas covered by NFRP	No data	Linked to coverage of NFRP	Not specified
Future risk	No data	No data	No data	No data	No data	No data
References: Malta Resources Authority (2013)						
Case study examples: costs and benefits of projects						
Project	Investment made		EU funds	Funding source	Other sources	
National Flood Relief Project	€62,505,662 (2007-2013)		€44,887,763	Cohesion Fund	Maltese Government	
References: European Commission (nd)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
National Flood Relief Project	9 localities in 4 basins (Birkirkara-Msida, Gzira, Qormi-Marsa and Marsascale)	No data	No data	No data	Reduce vulnerability to climate change	
References: European Commission (nd)						
Project	Grey	Green	Soft	Planned or delivered		
National Flood Relief Project	Network of 65km ² underground tunnels, canals and bridges to provide storm drainage	None reported	None reported	Delivered		
References: European Commission (nd)						
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks	
National Flood Relief Project	None reported	Pilot project exploring the possibility of re-	None reported	None reported	None reported	

MALTA			Between 2002 and 2013, for the 13 floods the total direct costs were €390 million (damages only found for 1 out of 13 floods, damages extrapolated across all 13 floods. The average cost per flood was €30 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
		use of storm water from urban and rural areas			
References: European Commission (nd)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
3	-
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Business Advisor Service									x							
Invest in your future				x				x				x				
Malta Enterprise									x							
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	27,304	
SMEs taking actions to improve resource efficiency		
	MT	EU28
Measures to save energy	76%	67%
Measures to minimise waste	60%	67%
Measures to save water	42%	51%
Measures to save materials	50%	59%
Many measures	27%	35%
No measures	8%	6%
Comprehensive systems for energy efficiency	3%	4.26%
Benefitting from public support for measures	6%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	34,484	61,585	83,966	44,350
Energy savings (kwh/year)	290,217	327,657	10,857	183,410
CO2 savings (tonnes/year)	222	132	4	65
Savings in waste (tonnes/year)	7	24	1,427	159
Savings in raw materials (tonnes/year)	234	75,990	1,823	3,176
Savings in water (m ³ /year)	71	1625	14	51
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	95.6	Unavailable	0.76%	Unavailable
Breakdown by category:				
Protection of ambient air and climate	8.69	Unavailable	4245%	Unavailable
Wastewater management	18.6	Unavailable	-9.54%	Unavailable
Waste management	44.3	Unavailable	-21.5%	Unavailable
Protection and remediation of soil, groundwater and surface water	Unavailable	Unavailable	Unavailable	Unavailable
Noise and vibration abatement	Unavailable	Unavailable	Unavailable	Unavailable
Protection of biodiversity	17.6	Unavailable	19%	Unavailable

Environmental expenditure for latest year for which data are available (€ million)				
and landscapes				
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	6.52	Unavailable	117%	Unavailable
<p>Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.</p> <p>Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).</p> <p>Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable</p>				
Category	2011		EU average for 2011	
Public environmental expenditure as percentage of total public expenditure	3.46%		1.34%	
	<p>Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014</p>			
Total environmental expenditure as percentage of GDP	2011		EU average for 2011	
	Unavailable		2.26%	
	-		<p>Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)</p>	

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2011	EU total for 2011
		Unavailable
Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets		

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Life+⁽¹⁾; The European Fisheries Fund⁽²⁾; The European Agricultural Fund for Rural Development⁽³⁾</p> <p>Sources: ¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ² European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ³ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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SBA Fact Sheets (2013): SBA Country Fact Sheets, European Commission, accessed at: <http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/> on 31 January 2014.

1.1 Financial, economic and social costs of floods

THE NETHERLANDS				Between 2002 and 2013, for the 3 floods recorded the total direct costs were € 14 million (damages available for all 3 floods). The average cost per flood was €5 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2003	€11 ⁽¹⁾	No data	No data	
2011	€3 ⁽¹⁾	No data	No data	
References: ¹ Pers. Comm. Marc Bokkerink 09/12/13				
Assumptions and caveats: Only records of floods found were from Pers. Comm. Marc Bokkerink 09/12/13 Costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, no applications for EU Solidarity fund were made
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats:
No applications				
References: Inforegio (2013); European Commission (2012)				
Investments made				Between 2002 and 2013, €7,782 million was invested in flood risk management measures (based on equal spending per year), equivalent to €707 million per year on average. €84 million was from EU funds (but not all of this total may have been used for flood risk management)
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:
2001-2015	€743 ⁽¹⁾	No data	No data	National Floods Defence Construction Programme: strengthening coastal weak links
	€300 ⁽¹⁾	No data	No data	Strengthening other coastal primary weirs that are not up to the required standards
	€1,800 ⁽¹⁾	No data	No data	Inland flood defence protection
2002	€22 ⁽¹⁾	No data	No data	Annual expenditure on sand nourishment
2008	€173 ⁽¹⁾	No data	No data	Annual capital expenditure
2008	€70 ⁽¹⁾	No data	No data	
2010	€1,070 ⁽²⁾	No data	No data	Funds from national Government for development of water and spatial planning policy including lake, river and coastal management and maintenance and reconstruction of dams and structures, large navigational waterways and inspection
	€230 ⁽²⁾	No data	No data	Funds from provinces for spatial planning, water management planning on a regional level and maintenance of provincial navigational waterways, inspection and permits for dike reconstruction
	€2,600 ⁽²⁾	No data	No data	Funds from Water Boards for management of 55,000km of waterways, 18,000km of dikes and 360

THE NETHERLANDS				Between 2002 and 2013, for the 3 floods recorded the total direct costs were € 14 million (damages available for all 3 floods). The average cost per flood was €5 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
	€1,300 ⁽²⁾	No data	No data	sewage treatment plants		
2007-2013	-	€84	Cohesion Fund	Funds from municipalities for sewer systems and some local waterways		
References: ¹ Policy Research Corporation (2009); ² Rijkswaterstaat (2012); ³ European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	60% of territory is prone to flooding ⁽¹⁾	31% of the total urban population and 35% of the total population live in flood prone zones (river areas plus coastal zone) ⁽²⁾ with 100,000 people live outside areas protected by dikes ⁽³⁾	No data	Economic damages estimated at around €135 million per year ⁽⁴⁾	Not specified	EAD for 2009 Data on people living outside protected areas for 2011. Other unspecified.
Future risk	No data	No data	Estimated that an additional 500,000 to 1,500,000 new houses will be constructed ⁽⁵⁾	Predicted to increase by 40% to 70% depending upon the economic growth scenario used (from €135 million) ⁽⁴⁾	Not specified	By 2040 and 2050
References: ¹ WMO & GWP (2011); ² De Moel H et al (2011); ³ Rijkswaterstaat (2012); ⁴ Klijn F et al (2012); ⁵ Aerts J (2009)						
Assumptions and caveats: Other data for EAD expressed as % of GNP earned below sea level, 70% of the Dutch GNP (Ten Brinke et al , 2010) with an estimated 9 million people living below sea level (Aerts, 2009)						
Estimated investment need to cover increases in risk into the future		€1.2 to 1.6 billion per year needed to avoid damages related to flooding to buildings due to sea level rise				
Year	Investments needed	Assumptions and caveats: Costs have not been normalised				

THE NETHERLANDS		Between 2002 and 2013, for the 3 floods recorded the total direct costs were € 14 million (damages available for all 3 floods). The average cost per flood was €5 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
To year 2050	€1.2 billion to €1.6 billion per year	Costs reported for the implementation of Delta Programme ⁽¹⁾ Potential damages of €400 billion to €800 billion in 2040 and €3,700 billion in 2100 in the absence of any measures with sea level rise of 24 to 60cm in 2040 and 150cm in 2100 ⁽²⁾ Study area covering Rotterdam, Dordrecht, Biesbosch. Current 25% of buildings in flood risk area, 37% in at risk area in 2050, 54% in at risk area in 2100 Damages in unembanked area of €36 million per year. Damages to residential buildings of €2.5 million per year, increasing to €4.5 million per year in 2050 and €6.9 million per year in 2100 ⁽³⁾			
2050-2100	€0.9 billion to €1.5 billion per year				
References: ¹ WMO & GWP (2011); ² Aerts J et al (2008); ³ De Moel H (2013)					
Case study examples: costs and benefits of projects					
Project	Investment made	EU funds	Funding source	Other sources	
The Sand Engine (Sand Motor) ⁽¹⁾	€70 million (2011) ⁽²⁾	None	Building with Nature (a consortium of Dutch industries, universities, research institutes and public water agencies)	None	
References: ¹ Katz C (2013); ² Rijkswaterstaat and Deltares (2011)					
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits
The Sand Engine (Sand Motor) ⁽¹⁾	Dutch coast, particularly the west coast	No data	No data	Not more cost effective than small scale nourishment but has added value for recreation and nature ⁽²⁾	Coast no longer requires replenishment every 5 years, Sand Engine will feed beaches for about 20 years at half the price
References: ¹ Katz C (2013); ² Rijkswaterstaat and Deltares (2011)					
Project	Grey	Green	Soft	Planned or delivered	
The Sand Engine (Sand Motor) ⁽¹⁾	None reported	Sand deposited on the beach and ocean currents gradually distribute it ⁽¹⁾ Includes a lake which introduces variation and enables nature to develop better ⁽²⁾	None reported	Delivered*	

THE NETHERLANDS		Between 2002 and 2013, for the 3 floods recorded the total direct costs were € 14 million (damages available for all 3 floods). The average cost per flood was €5 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
References: ¹ KatzC (2013); ² Rijkswaterstaat and Deltares (2011)					
Assumptions and caveats: *the sand has been put in place however the process of redistribution by the sea will take years					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
The Sand Engine (Sand Motor) ⁽¹⁾	Reduced frequency of beach nourishment will allow nature systems to recover	None reported	None reported	None reported	Problems associated with dredging the sand
References: ¹ Katz C (2013)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
8	7
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
123 Subsidie NL							x		x						x	
Duurzaam MKB [sustainable SME]				x	x	x		x								
Energie Centrum			x	x		x		x						x	x	
Energy Investment Allowance	x															
MIA and Vamil	x			x				x								

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Green Deal				x			x	x								
Green Funds Scheme	x															
Industrial Environmental Agencies (BMD)																x
Innovatiefonds MKB+ [Innovation funds SME]									x							
Knowledge Networks												x				
Milieubarometer [environment-barometer]						x										
SCCM				x												x
Stimular			x		x	x										
Syntens				x		x		x		x		x		x		
The Random Depreciation of Environmental Investments (VAMIL)	x															
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	681,047	
SMEs taking actions to improve resource efficiency		
	NL	EU28
Measures to save energy	67%	67%
Measures to minimise waste	66%	67%
Measures to save water	27%	51%
Measures to save materials	65%	59%
Many measures	32%	35%
No measures	7%	6%
Comprehensive systems for energy efficiency	-	4.26%
Benefitting from public support for measures	-	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	21,518	38,428	52,393	27,674
Energy savings (kwh/year)	496,533	560,588	18,575	313,796
CO2 savings (tonnes/year)	379	226	7	111
Savings in waste (tonnes/year) *	NA	NA	NA	NA
Savings in raw materials (tonnes/year)	146	47,417	1,137	1,982
Savings in water (m3/year)	36	822	7	26

Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses> accessed on 31 January 2014

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2009		Change between 2008 and 2009	
	Public	Private	Public	Private
Total	8505	Unavailable	Unavailable	Unavailable
Breakdown by category:				
Protection of ambient air and climate	705	Unavailable	Unavailable	Unavailable
Wastewater management	2826	Unavailable	Unavailable	Unavailable
Waste management	2401	Unavailable	Unavailable	Unavailable
Protection and remediation of soil, groundwater and surface water	288	Unavailable	Unavailable	Unavailable
Noise and vibration abatement	46.4	Unavailable	Unavailable	Unavailable
Protection of biodiversity and landscapes	893	Unavailable	Unavailable	Unavailable
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	1345	Unavailable	Unavailable	Unavailable

Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.

Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).

Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2009		Change between 2008 and 2009	
	Public	Private	Public	Private
included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable				
Category	2009		EU average for 2009	
Public environmental expenditure as percentage of total public expenditure	2.89%		1.44%	
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014			
Total environmental expenditure as percentage of GDP	2009		EU average for 2009	
	Unavailable		2.34%	
		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)		

Environmental employment			
Number of jobs in the environmental goods and services sector (1000s)	2010		EU total for 2010
	120		34,087
Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets			

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Eco-Innovation fund⁽¹⁾; INTERREG IVC⁽²⁾; Life+⁽³⁾; The European Fisheries Fund⁽⁴⁾; The European Agricultural Fund for Rural Development⁽⁵⁾</p> <p>Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-projects.eu/eco/page/Page.jsp on 1 December 2013. ² INTERREG IVC (nd): Approved Projects Database, accessed at: http://www.interreg4c.eu/projects/ on 29 November 2013. ³ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ⁴ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁵ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

POLAND				Between 2002 and 2013, for the 10 floods recorded the total direct costs were €24,000 million (damages found for 2 out of 10 floods, damages extrapolated across all 10 floods). The average cost per flood was €2,400 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2004	N/Q	No data	No data	600 people affected ⁽¹⁾
2005	N/Q	4 ⁽³⁾	No data	1,200 buildings flooded ⁽³⁾
2006	N/Q	No data	No data	1,000 buildings flooded ⁽³⁾
2009	€72 ⁽¹⁾	1 ⁽¹⁾	No data	Hundreds of homes damaged, several people injured ⁽³⁾
2010	€4,696 ⁽²⁾	19 ⁽¹⁾	No data	31,000 people evacuated from their homes ⁽²⁾
2013	N/Q	No data	No data	
References and sources of information: ¹ CRED (nd); ² Polish Government (2010); ³ DFO (nd)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, €106 million was received from the EU Solidarity Fund. Total direct damages were €2,994 million. 1 applications were accepted and 0 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2010	€2,994	€106	Major flooding	
References: Inforegio (2013); European Commission (2012)				
Investments made				Between 1997 and 2013, €1,444 million was invested in flood risk management measures, equivalent to €90 million per year on average. €18 million was from EU funds (but not all of this total may have been used for flood risk management)
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:
2004	€530	No data	No data	Funding for water management, which includes flood risk measures ⁽¹⁾ Exchange rate GBP/EUR 0.67866 ⁽²⁾
2005	€453	No data	No data	Funding for water management, which includes flood risk measures ⁽¹⁾ Exchange rate GBP/EUR 0.68380 ⁽²⁾
1997-2003	€443	No data	No data	Includes cost of repairing flood embankments ⁽¹⁾ Exchange rate GBP/EUR 0.60948 (for the mid-year – 2000) ⁽²⁾

POLAND				Between 2002 and 2013, for the 10 floods recorded the total direct costs were €24,000 million (damages found for 2 out of 10 floods, damages extrapolated across all 10 floods). The average cost per flood was €2,400 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
2007-2013	-	€18	Cohesion Fund	General improvements to the environment ⁽³⁾ . Limited/no data on specific allocation from other funds		
References: ¹ National Audit Office (2007); ² European Central Bank (ECB) (nd); ³ European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	5,300km at risk in Vistula basin (protected by embankments ⁽¹⁾)	Around 1 million people are at risk of flooding (around 3% of the population) ⁽²⁾	No data	No data	Not specified	Not specified
Future risk	No data					
References: ¹ Kundzewicz ZW (2013); ² National Audit Office (2007)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Wroclaw Floodway System	Over US\$ 400 million ⁽¹⁾ (€287 million) (exchange rate USD/EUR 1.3920 (2011)) ⁽⁴⁾	US\$ 130 million ^{(3)*} (€93 million) (exchange rate USD/EUR 1.3920 (2011)) ⁽⁴⁾	The World Bank, European Union grants and local investment ⁽²⁾	US\$ 184 million from the World Bank ⁽³⁾ (€132 million) (exchange rate USD/EUR 1.3920 (2011)) ⁽⁴⁾		
References: ¹ Jha A K et al (2011); ² Halcrow (2011); ³ World Bank (2014); ⁴ Eurostat (nd)						
Assumptions and caveats: * This amount was provided by the European Commission, however, it is not clear if this is a grant or a loan.						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
Wroclaw Floodway System	City of Wroclaw	No data	Flood protection measures protect 2.5 million inhabitants ⁽¹⁾	No data	Provides protection of the floodwaters of the River Odra that flows through Wroclaw ⁽¹⁾	
References: ¹ Jha A K et al (2011)						
Project	Grey	Green	Soft	Planned or delivered		
Wroclaw Floodway System	Increase capacity of diversion structure and channel to the River Widawa, improve embankments along	None reported	Improved flood forecasting and warning systems ⁽¹⁾	Ongoing		

POLAND		Between 2002 and 2013, for the 10 floods recorded the total direct costs were €24,000 million (damages found for 2 out of 10 floods, damages extrapolated across all 10 floods). The average cost per flood was €2,400 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
	the River Odra and removal of material to increase river capacity ⁽¹⁾ Creation of the Bukow Polder and Raciborz Polder, which act as water storage areas ⁽¹⁾⁽²⁾				
References: ¹ Jha A K et al (2011); ² DHV Hydroprojekt (nd)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Wroclaw Floodway System	None reported	None reported	None reported	None reported	The drying up/flooding of polders may impact established habitat
Assumptions and caveats: Based on consultants' interpretation of likely ecosystem service benefits/damages					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
0	4
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME Support programmes identified and services provided		Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Clean	Business			X		X	X						X				

SME Support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Programme																
KSU										x		x			x	
SPIN				x		x				x	x	x			x	
The Implementation Project					x					x				x		x
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	1,541,341	
SMEs taking actions to improve resource efficiency		
	PL	EU28
Measures to save energy	64%	67%
Measures to minimise waste	48%	67%
Measures to save water	51%	51%
Measures to save materials	56%	59%
Many measures	22%	35%
No measures	6%	6%
Comprehensive systems for energy efficiency	2%	4.26%
Benefitting from public support for measures	14%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	construction
Cost savings (EUR)	6,495	1,1600	15,815	8,354
Energy savings (kwh/year)	407,632	460,219	15,249	257,613
CO2 savings (tonnes/year)	311	185	6	91
Savings in waste (tonnes/year)	4	15	873	97
Savings in raw materials (tonnes/year)	44	14313	343	598
Savings in water (m3/year)	16	374	3	12
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€ million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	1,967	3,989	33.8%	7%
Breakdown by category:				
Protection of ambient air and climate	53.9	1082	95.8%	24.2%
Wastewater management	1215	1378	24.7%	-7.26%
Waste management	134	824	6.04%	-0.7%
Protection and remediation of soil, groundwater and surface water	54.5	198	486%	10.5%
Noise and vibration abatement	54.8	33.5	96%	0.69%
Protection of biodiversity and landscapes	168	135	503%	48.3%
Protection against radiation	unavailable	unavailable	unavailable	unavailable
Research and development for environmental protection	unavailable	unavailable	unavailable	unavailable
Other environmental protection activities	286	341	3.6%	42.7%
<p>Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.</p> <p>Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).</p> <p>Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable</p>				
Category	2011		EU average for 2011	
Public environmental expenditure as percentage of total public expenditure	1.22%		1.34%	
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014			
Category	2011		EU average for 2011	
Total environmental expenditure as percentage of GDP	2.77%		2.26%	
	Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised	

Environmental expenditure for latest year for which data are available (€ million)	
	<p>activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014;</p> <p>GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014</p>
	<p>producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)</p>

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2009	EU total for 2009
		Eurostat data unavailable
	<p>Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014.</p> <p>Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets</p>	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Life+⁽¹⁾; European funds (ERDF, CF & IPA)⁽²⁾; The European Fisheries Fund⁽³⁾; The European Agricultural Fund for Rural Development⁽⁴⁾</p> <p>Sources: ¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ² European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ³ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁴ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

PORTUGAL				Between 2002 and 2013, for the 11 floods recorded the total direct costs were €6,100 million (damages found for 2 out of 11 floods, damages extrapolated across all 11 floods). The average cost per flood was €550 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	N/Q	1 ^[3]	No data	60 people homeless ⁽³⁾
2003	N/Q	No data	No data	36 people affected ⁽³⁾
2006	N/Q	0 ⁽⁴⁾	No data	240 people affected ⁽⁴⁾
2008	N/Q	3 ⁽⁴⁾	No data	38 people homeless ⁽³⁾
2010	€1,080 ⁽¹⁾	43 ^[1]	120 ^[5]	618 people affected ⁽⁴⁾ ; estimated time scale for relocation of 160 dwellings – 6 months. Time scale for relocation of 52 dwellings to be built – 16 months ⁽¹⁾
2012	€26 ⁽²⁾	No data	No data	
2013	N/Q	3 ^[6]	1 ⁽⁷⁾	30 people rehoused ⁽⁷⁾
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
References and sources of information: ¹ Government of the Portuguese Republic (2010); ² Governo Regional Da Madeira (2012); ³ CRED (nd); ⁴ Pers Comm (Portuguese Ministry of Environment, Spatial Planning and Energy_ ⁵ Reuters (2010); ⁶ naturaldisastersnews.net (2013); ⁷ DFO (nd)				
EU Solidarity fund				Between 2002 and 2013, €31 million was received from the EU Solidarity Fund. Total direct damages were €1,106 million. 1 application was accepted and 1 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2010	€1,080	€31.256 millions	Major mud and landslides (Madeira)	
2012	€26	Rejected	Regional mudslides (Madeira)	
References: Inforegio (2013); European Commission (2012)				
Investments made				Between 1998 and 2015, €5,240 million was invested in flood risk management measures, equivalent to €308 million per year on average. €5 billion was from EU funds (but not all of this total may have been used for flood risk management)
Year	Investments made	EU funds received	EU funds	Assumptions and caveats: Costs have not been normalised

PORTUGAL				Between 2002 and 2013, for the 11 floods recorded the total direct costs were €6,100 million (damages found for 2 out of 11 floods, damages extrapolated across all 11 floods). The average cost per flood was €550 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
	(€million)	(€million)				
1999-2000	€17	No data	No data	Budgets for coastal management plans ⁽¹⁾ : Caminha-Espinho, Over-Marinha Grance, Alcobaca-Mafre, Sintra-Sado, Cidadela-SJ Da Barra, Sado-Sines, Sines-Bugau, Bugau-Vilmoura, Vilmoura-VRSA Total expenditure on coastal protection (flooding and erosion)		
2000-2010	€19	No data	No data			
2002-2015	€12	No data	No data			
2003-2015	€1.1	No data	No data			
1998-2009	€5	No data	No data			
1999-2009	€0.02	No data	No data			
1998-2009	€0.6	No data	No data			
1998-2009	€12	No data	No data			
2005-2015	€17	No data	No data			
2008	€12	No data	No data			
1998-2015	€131	No data	No data	Investment planned for river management projects ⁽²⁾ Improving the environment, promoting sustainable growth and combating climate change ⁽³⁾		
2000-2006	€14	No data	No data			
2007-2013	-	€5,000	Cohesion Fund			
References: ¹ Policy Research Corporation (2009); ² GHK (2006); ³ European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	Main risks from flooding are in coastal areas, with very few exceptions ⁽¹⁾	No data	No data	No data	No data	Not specified ⁽¹⁾
Future risk	No data	No data	No data	No data	No data	No data
References: ¹ GHK (2006)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
HIDRALERTA – Flood Forecast and Alert System in Coastal and Port Areas	€160,000 ⁽¹⁾ *	No data	Foundation for Science and Technology (Portugal) ⁽²⁾	Center for Informatics and Information Technologies (CITI) ⁽¹⁾		
References: ¹ CITI (2012); ² FCSH (2009)						
Assumptions and caveats: * The project is still ongoing (from 2012 to 2015) so it is unclear if this refers to the total cost or the costs to date						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
HIDRALERTA – Flood Forecast and Alert System in Coastal and Port Areas	Coastal regions and port areas in Portugal	No data	No data	No data	Forecast overtopping and flood events in coastal and port areas to enable	

PORTUGAL		Between 2002 and 2013, for the 11 floods recorded the total direct costs were €6,100 million (damages found for 2 out of 11 floods, damages extrapolated across all 11 floods). The average cost per flood was €550 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
					more effective management decisions and mitigation measures ⁽¹⁾
References: ¹ Rospeiro P et al (2013)					
Project	Grey	Green	Soft	Planned or delivered	
HIDRALERTA – Flood Forecast and Alert System in Coastal and Port Areas	None reported	None reported	Development of a forecast, alert and long-term risk analysis system to enable more effective mitigation and management of coastal flood events ⁽¹⁾	Ongoing ⁽²⁾ *	
References: ¹ Rospeiro P et al (2013); ² CITI (2012)					
Assumptions and caveats: * The project is still ongoing (from 2012 to 2015).					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
HIDRALERTA – Flood Forecast and Alert System in Coastal and Port Areas	Better forecasting should help to more effectively mitigate the environmental damages caused by coastal flooding ⁽¹⁾	None reported	Better forecasting should help to more effectively mitigate the impacts caused by coastal flooding to soil	None reported	None reported
References: ¹ Rospeiro P et al (2013)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
1	1
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
ECO-SME+						x				x						x
The National Association for Young Entrepreneurs				x	x		x							x		
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	798,480	
SMEs taking actions to improve resource efficiency		
	PT	EU28
Measures to save energy	90%	67%
Measures to minimise waste	73%	67%
Measures to save water	77%	51%
Measures to save materials	85%	59%
Many measures	60%	35%
No measures	4%	6%
Comprehensive systems for energy efficiency	5%	4.26%
Benefitting from public support for measures	4%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	7,649	13,661	18,625	9,838
Energy savings (kwh/year)	307,638	347,325	11,509	194,419
CO2 savings (tonnes/year)	235	140	5	69
Savings in waste (tonnes/year)	9	33	1,937	216
Savings in raw materials (tonnes/year)	52	16,856	404	704
Savings in water (m ³ /year)	14	323	3	10
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	829	395	-11.4%	-13.4%
Breakdown by category:				
Protection of ambient air and climate	7.2	115	181%	-41%
Wastewater management	1	85	-99.4%	14.5%
Waste management	506	121	2.58%	1.58%
Protection and remediation of soil, groundwater and surface water	93.6	21.3	156%	0.66%
Noise and vibration abatement	1.43	3.57	44%	-29%
Protection of biodiversity and landscapes	169	22.4	-5.2%	40%
Protection against radiation	unavailable	unavailable	unavailable	unavailable
Research and development for environmental protection	unavailable	unavailable	unavailable	unavailable
Other environmental protection activities	50.5	27	3.0%	3.4%
<p>Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.</p> <p>Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).</p> <p>Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable</p>				
Category	2011		EU average for 2011	
Public environmental expenditure as percentage of total public expenditure	0.98%		1.34%	
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014			
Category	2011		EU average for 2011	
Total environmental expenditure as percentage of GDP	0.72%		2.26%	
	Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised	

Environmental expenditure for latest year for which data are available (€million)		
	sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014	producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2011	EU total for 2011
	Eurostat data unavailable	4,194
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Life+⁽¹⁾; European funds (ERDF, CF & IPA)⁽²⁾; The European Fisheries Fund⁽³⁾; The European Agricultural Fund for Rural Development⁽⁴⁾</p> <p>Sources: ¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ² European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_re_g=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ³ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁴ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

ROMANIA				Between 2002 and 2013, for the 20 floods recorded the total direct costs were €3,640 million (damages found for 10 out of 19 floods). The average cost per flood was €364 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€71.8 ⁽¹⁾	15 ⁽¹⁾	1 ⁽²⁾	More than 2,900 km of roads and 1,900 bridges and footbridges destroyed ⁽¹⁾
2003	€25.5 ⁽¹⁾	6 ⁽¹⁾	No data	20km of roads submerged ⁽¹⁾
2004	€89.4 ⁽¹⁾	18 ⁽¹⁾	No data	More than 1800 km of roads damaged ⁽¹⁾
2005	€1636.9 ⁽¹⁾	76 ⁽¹⁾	2 ⁽²⁾	655,000 ha agricultural land and 4,354 ha forests flooded ⁽¹⁾
2006	€419 ⁽¹⁾	17 ⁽¹⁾	2 ⁽²⁾	Over 113,000 ha of farmland ⁽¹⁾
2007	€183.3 ⁽¹⁾	10 ⁽¹⁾	No data	1,400 people stranded in Moldovita and Vatra Modovita ⁽¹⁾
2008	€555.3 ⁽¹⁾	7 ⁽¹⁾	No data	Close to 3,000 km km of roads and 2,000 bridges flooded ⁽¹⁾
2009	€36.9 ⁽¹⁾	0 ⁽¹⁾	No data	24,000 ha of agricultural land flooded ⁽¹⁾
2010	€879 ⁽³⁾	23 ⁽⁴⁾	No data	110,585 ha of crops, 33,110 ha of pastures, vineyards and 8,220 ha of saplings destroyed ⁽³⁾
2011	€32 ⁽¹⁾	0 ⁽¹⁾	No data	Over 11,000 ha arable land flooded ⁽¹⁾
2012	€143.7 ⁽¹⁾	1 ⁽¹⁾	No data	Over 15,000 ha arable land flooded ⁽¹⁾
2013	€12 ⁽⁵⁾	13 ⁽¹⁾	No data	Some 700 houses were flooded ⁽⁶⁾
References and sources of information: ¹ Pers. Comm. (Ministry of Environment and Climate for Romania); ² CRED (nd); ³ Government of Romania (2010); ⁴ Ministry of Administration and Interior, General Inspectorate for Emergency Situations (nd); ⁵ Euronews (2013); ⁶ DFO (nd)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, €108 million was received from the EU Solidarity Fund. Total direct damages were €2,886 million. 4 applications were accepted and 0 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2005	€489	€19	Major flooding	
	€1,050	€52	Major flooding	
2008	€471	€12	Regional flooding	
2010	€876	€25	Major flooding	

ROMANIA				Between 2002 and 2013, for the 20 floods recorded the total direct costs were €3,640 million (damages found for 10 out of 19 floods). The average cost per flood was €364 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
References: Inforegio (2013); European Commission (2012)						
Investments made				Between 2002 and 2013, €9,804 million was invested in flood risk management measures, equivalent to €891 million per year on average. €8,653 million was from EU funds (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats: Costs have not been normalised		
2004 – 2013 ⁽¹⁾	€730	No data	No data	Total needed to implement comprehensive overall master plan		
	€400	No data	No data	Amount secured from EU and international donors		
2008 – 2010 ⁽²⁾	€21	No data	No data	Funds for 108 objectives of watershed management works		
2007-2013 ⁽³⁾	€142	€53	No data	Investment for flood protection, divided into: €49 million for 10 contracts to implement the EU FD (plan to prevent, protect and mitigate the effects of floods including flood hazard map development in the following basins: Somes-Tisa, Crisuri, Mures, Banat, Jiu, Olt, Arges-Vedea, Buzăa-Ialomita, Siret, Dobrogea-Litoral); €53 million from EU funds for WATMAN Integrated water management system, phase 1; €125 million for implementation of “no-regret measures”; €65 million for flood risk reduction Prut-Barlad (plans, maps and infrastructure); planned investments normally exceed the earmarked funds, as it is assumed that several proposals will proceed		
	€134	No data	No data	Investment for coastal protection. Coastal erosion is related to the Black Sea only – coastal erosion project €6.5 million. At this moment a large project on coastal erosion along the Black Sea is being tendered, Budget is unclear.		
2007-2013	-	€8,600	Cohesion Fund	Investments directly contributing to improving the environment (including water treatment) ⁽⁴⁾		
References: ¹ World Bank (2004); ² Ministry of Environment and Forests (nd); ³ Administratia Natională “Apele Române” (2012); ⁴ European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk ⁽¹⁾	No data	1.2 million	No data	No data	No data	Not specified
Future risk	No data	No data	No data	No data	No data	No data
References: ¹ UNISDR (2008)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Implementation of Plan for flood prevention, protection and mitigation in Argeş-	€2.8 million (2011-2014)	No data	Part of the €49 million for 10 contracts	No data		

ROMANIA		Between 2002 and 2013, for the 20 floods recorded the total direct costs were €3,640 million (damages found for 10 out of 19 floods). The average cost per flood was €364 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
Vedea basin					
References: Rowater (nd); Rowater (nda)					
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits
Implementation of Plan for flood prevention, protection and mitigation in Argeş-Vedea basin	Argeş-Vedea	No data	No data	No data	Improved flood resilience
References: Rowater (nd); Rowater (nda)					
Project	Grey	Green	Soft	Planned or delivered	
Implementation of Plan for flood prevention, protection and mitigation in Argeş-Vedea basin	None reported	None reported	Surveying, mapping and production of flood prevention plans	Ongoing*	
References: Rowater (nd); Rowater (nda)					
Assumptions and caveats: *Started 2011, due for completion 2014					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Implementation of Plan for flood prevention, protection and mitigation in Argeş-Vedea basin	None reported	None reported	None reported	None reported	None reported

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
-	-

No resource efficiency support programmes were identified in Romania during the course of this study.

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	474,416	
SMEs taking actions to improve resource efficiency		
	RO	EU28
Measures to save energy	72%	67%
Measures to minimise waste	52%	67%
Measures to save water	57%	51%
Measures to save materials	60%	59%
Many measures	25%	35%
No measures	9%	6%
Comprehensive systems for energy efficiency	4%	4.26%
Benefitting from public support for measures	3%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	4,043	7,220	9,844	5,200
Energy savings (kwh/year)	257,641	290,878	9,638	162,823
CO2 savings (tonnes/year)	197	117	4	58
Savings in waste (tonnes/year)	1	2	115	13
Savings in raw materials (tonnes/year)	27	8,909	214	372
Savings in water (m ³ /year)	8	184	2	6
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	1,255	1,130	55.9%	-7.86%
Breakdown by category:				
Protection of ambient air and climate	42	186	-45%	-44.9%
Wastewater management	610	148	78.1%	-30.7%
Waste management	374	181	88.2%	-38%
Protection and remediation of soil, groundwater and surface water	4.73	69.5	-68%	-59%
Noise and vibration abatement	5.23	19.1	-5.9%	689%
Protection of biodiversity	174	102	1,271%	165%

Environmental expenditure for latest year for which data are available (€million)				
and landscapes				
Protection against radiation	unavailable	unavailable	unavailable	unavailable
Research and development for environmental protection	unavailable	unavailable	unavailable	unavailable
Other environmental protection activities	45.2	424	-71%	143%
Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.				
Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).				
Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable				
Category	2011		EU average for 2011	
Public environmental expenditure as percentage of total public expenditure	2.43%		1.34%	
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014			
Total environmental expenditure as percentage of GDP	2011		EU average for 2011	
	3.93%		2.26%	
	Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014;		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)	
	GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014			

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2011	EU total for 2011
		0.1
Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets		

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Life+⁽¹⁾; European funds (ERDF, CF & IPA)⁽²⁾; The European Fisheries Fund⁽³⁾; The European Agricultural Fund for Rural Development⁽⁴⁾</p> <p>Sources: ¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ² European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_re g=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ³ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fi sheries_fund_en.pdf on 17 January 2014. ⁴ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

SLOVAKIA				Between 2002 and 2013, for the 24 floods recorded the total direct costs were €790 million (damages available for all 24 floods). The average cost per flood was €33 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€49 ⁽¹⁾	1 ⁽³⁾	No data	7,179 people affected ⁽³⁾
2003	€1.5 ⁽¹⁾	No data	No data	
2004	€37 ⁽¹⁾	19 ⁽⁴⁾	No data	Hundreds of houses flooded ⁽⁴⁾
2005	€39 ⁽¹⁾	1 ⁽⁴⁾	No data	
2006	€63 ⁽¹⁾	3 ⁽⁴⁾	No data	Properties of 26 people were damaged, mainly in socially-disadvantaged regions ⁽⁷⁾
2007	€34 ⁽¹⁾	No data	No data	
2008	€40 ⁽¹⁾	2 ⁽⁵⁾	No data	
2009	€8.4 ⁽¹⁾	2 ⁽⁵⁾	No data	150 occupants evacuated ⁽⁸⁾
2010	€481 ⁽¹⁾	4 ⁽⁶⁾	No data	4,782 people evacuated from the Presovsky region and 1,107 from the Banskobystricky region ⁽⁹⁾
2011	€20 ⁽¹⁾	No data	No data	
2012	€2.4 ⁽¹⁾	No data	No data	
2013	€12.4 ⁽²⁾	1 ⁽⁶⁾	No data	40 people evacuated ⁽²⁾
References and sources of information: ¹ Pers. Comm. Peter Cadek 19/12/13; ² Pers. Comm, (Ministry of Environment of the Slovak Republic); ³ Ministerstvo Zivotneho Prostredia Slovenskej Republiky (2002); ⁴ DFO (nd); ⁵ Cipovová K (nd); ⁶ CRED (nd); ⁷ Ministry of Environment and Climate Change (nda); ⁸ Slovak Spectator (2009); ⁹ Ministry of Environment and Climate Change (nd)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline. The Ministry of the Environment of the Slovak Republic highlights that there have been many hundreds of flood incidences, however, many of these incidences do not exceed the EM-DAT thresholds and so have not been included here (for consistency with other Member States); damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2004 and 2010, €26.099 million was received from the EU Solidarity Fund. Total direct damages were €881.9 million. 2 applications were accepted and 1 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2004	€232	€5.7	Regional and major flooding	Two applications submitted in this year, 1 accepted, 1 rejected
2010	€650	€20	Major flooding	
References: Inforegio (2013); European Commission (2012)				

SLOVAKIA				Between 2002 and 2013, for the 24 floods recorded the total direct costs were €790 million (damages available for all 24 floods). The average cost per flood was €33 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Investments made				Between 2002 and 2013, €63.8 million was invested in flood risk management measures, equivalent to €5.3 million per year on average. €3,800 million was from EU funds (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats: Costs have not been normalised		
2002	€1.66 ⁽¹⁾	No data	No data			
2003	€0.14 ⁽¹⁾	No data	No data			
2004	€3.42 ⁽¹⁾	No data	No data			
2005	€2.67 ⁽¹⁾	No data	No data			
2006	€6.42 ⁽¹⁾	No data	No data			
2007	€0.21 ⁽¹⁾	No data	No data			
2008	€2.51 ⁽¹⁾	No data	No data			
2009	€1.59 ⁽¹⁾	No data	No data			
2010	€27.5 ⁽¹⁾	No data	No data			
2011	€12.6 ⁽¹⁾	No data	No data			
2012	€0.46 ⁽¹⁾	No data	No data			
2013	€4.6 ⁽¹⁾	No data	No data			
1999-2015	€172			113 projects for flood protection measures in the Slovak Republic ⁽²⁾		
2007-2013	-	€3,800	Cohesion Fund	Protection of the environment, including protection and rational use of water resources, as well as flood protection, waste management, regeneration of nature and landscapes, risk prevention and support for renewable energies; allocation for mitigation climate change is about €1.7 billion ⁽³⁾ . Limited/no data on specific allocation from other funds		
References: ¹ Pers. Comm. (Ministry of the Environment of the Slovak Republic); ² Anon (nd); ³ European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	Significant flood risk areas have been identified in 559 areas near water courses, with total length of 1,286.5 km. Out of the 559 geographic areas, 378 geographic areas have potential of a significant flood risk and in 181 geographic areas, the flood risk is likely to occur ⁽¹⁾	No data	No data	No data	Not specified	Not specified
Future risk	No data	No data	No data	No data	No data	No data

SLOVAKIA		Between 2002 and 2013, for the 24 floods recorded the total direct costs were €790 million (damages available for all 24 floods). The average cost per flood was €33 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
References: ¹ Pers. Comm. (Ministry of Environment of the Slovak Republic)					
Case study examples: costs and benefits of projects					
Project	Investment made	EU funds	Funding source	Other sources	
Bratislava Flood Protection Project, Danube and Morava Rivers	€32.7 million ⁽¹⁾	€26.6 million ⁽²⁾	European Union Cohesion Fund ⁽²⁾	Slovakian Government	
References: ¹ ICPDR (2009); ² Hirnerová D & Sabo J (2010)					
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits
Bratislava Flood Protection Project, Danube and Morava Rivers	Bratislava, Slovakia	No data	No data	No data	Enhanced flood protection ⁽¹⁾
References: ¹ ICPDR (2009)					
Project	Grey	Green	Soft	Planned or delivered	
Bratislava Flood Protection Project, Danube and Morava Rivers	Construction of flood protection lines along various sections of the Danube and Morava Rivers (consisting of concrete walls and earth dykes) ⁽¹⁾⁽²⁾	None reported	None reported	Delivered ⁽¹⁾	
References: ¹ ICPDR (2009); ² Hirnerová D & Sabo J (2010)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Bratislava Flood Protection Project, Danube and Morava Rivers	None reported	None reported	None reported	None reported	None reported

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
4	-
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Recycling Fund									x							
Tax exemptions	x															
The Environment Fund									x							
The National Agency for Development of Small and Medium Enterprises				x						x	x	x		x		
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	391,382*	
SMEs taking actions to improve resource efficiency		
	SK	EU28
Measures to save energy	74%	67%
Measures to minimise waste	79%	67%
Measures to save water	68%	51%
Measures to save materials	77%	59%
Many measures	51%	35%
No measures	7%	6%
Comprehensive systems for energy efficiency	3%	4.26%
Benefitting from public support for measures	4%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		
*Feedback from Member State indicates figure should be 483,352 but unadjusted here for consistency		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	8,707	15,550	21,202	11,199
Energy savings (kwh/year)	362,557	409,328	13,563	229,127
CO2 savings (tonnes/year)	277	165	5	81
Savings in waste (tonnes/year)	3	10	608	68
Savings in raw materials (tonnes/year)	59	19,188	460	802
Savings in water (m ³ /year)	64	1466	13	46

Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses> accessed on 31 January 2014

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€million)				
Category	Expenditure in 2011		Change between 2008 and 2011	
	Public	Private	Public	Private
Total	214	449	37%	-16%
Breakdown by category:				
Protection of ambient air and climate	21	94.8	38.2%	unavailable
Wastewater management	21.9	Unavailable	26.36%	unavailable
Waste management	164	112	36.1%	unavailable
Protection and remediation of soil, groundwater and surface water	2	Unavailable	68.3%	unavailable
Noise and vibration abatement	Unavailable	4.34	unavailable	37.8%
Protection of biodiversity and landscapes	4	unavailable	408%	unavailable
Protection against radiation	unavailable	unavailable	unavailable	unavailable
Research and development for environmental protection	unavailable	unavailable	unavailable	unavailable
Other environmental protection activities	unavailable	30.5	unavailable	-35.5%

Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.

Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).

Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable

Environmental expenditure for latest year for which data are available (€million)		
Category	2011	EU average for 2011
Public environmental expenditure as percentage of total public expenditure	0.81%	1.34%
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014	
Total environmental expenditure as percentage of GDP	2011	EU average for 2011
	1.14%	2.26%
Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
	2011	EU total for 2011
Number of jobs in the environmental goods and services sector (1000s)	Eurostat data unavailable	4,194
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Life+⁽¹⁾; European funds (ERDF, CF & IPA)⁽²⁾; The European Fisheries Fund⁽³⁾; The European Agricultural Fund for Rural Development⁽⁴⁾</p> <p>Sources: ¹ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ² European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_re_g=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ³ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁴ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social impacts of floods

SLOVENIA				Between 2002 and 2013, for the 7 floods recorded the total direct costs were €1,500 million (damages found for 5 out of 7 floods, damages extrapolated across all 7 floods). The average cost per flood was €220 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2005	€23 ⁽¹⁾	No data	No data	
2007	€233 ⁽²⁾	6 ⁽⁵⁾	No data	More than 17km of water infrastructure, more than 10km of electricity grid and 48 water reservoirs were damaged ⁽²⁾
2008	N/Q	No data	No data	
2010	€251 ⁽³⁾	2 ⁽⁶⁾	No data	Over 127 companies flooded ⁽³⁾
2012	€593 ⁽⁴⁾	No data	No data	More than 4,320 housing units inundated ⁽⁴⁾
References: ¹ Samardzija-Matul K (2005); ² European Commission (2007); ³ Government Office for Local Self-Government and Regional Policy of the Republic of Slovenia (2010); ⁴ Government Office for Local Self-Government and Regional Policy of Slovenia (2012); ⁵ DFO (nd); ⁶ Cerni B & Kuzmanovic J (2010)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2007 and 2012, €29.795 million was received. Total direct damages were €844.3 million. 3 applications were accepted and 0 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2007	€233	€8.3	Major flooding	
2010	€251	€7.5	Major flooding	
2012	€360	€14	Major flooding	
References: Inforegio (2013); European Commission (2012)				
Investments made				Between 2007 and 2013, € 795 million was invested in flood risk management measures, equivalent to €72 million per year on average. €770 million was from EU funds (but not all of this total may have been used for flood risk management)
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats: Costs have not been normalised
1998-2015	€21	No data	No data	Total expenditure on coastal protection (flooding and erosion) ⁽¹⁾
2007-2013	€1.6	No data	No data	Coastal area management ⁽¹⁾
2008	€3	No data	No data	Budgeted for protection against coastal flooding and

SLOVENIA				Between 2002 and 2013, for the 7 floods recorded the total direct costs were €1,500 million (damages found for 5 out of 7 floods, damages extrapolated across all 7 floods). The average cost per flood was €220 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
				erosion ⁽¹⁾		
2007-2013	€14	No data	No data	Estimated investment based on statistics and percentages of types of natural disasters for floods only (projected) ⁽²⁾		
2007-2013	-	€770	Cohesion Fund	Directly and an additional €805million indirectly will be invested from the Funds to improve the environment. Of this amount, almost €257 million (6%) directly and €511 million indirectly will be allocated to measures for mitigating the consequences of climate change ⁽³⁾		
References: ¹ Policy Research Corporation (2009); ² GHK (2006); ³ European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	More than 300,000 ha (14.7%) of the total country is at flood risk, with large extensive floods potentially affecting 94,000 ha. This is just 3% to 5% of the total area ⁽¹⁾	132,000 people (7% of the total population) live in regions that suffer from normal levels of flood risk (not defined), while 480,000 people (24%) live in regions where there is a high risk of flooding ⁽¹⁾	More than 2,500 ha of areas at flood risk is in urban areas ⁽¹⁾	No data	Catastrophic flood higher than 1:50 ⁽¹⁾	Not specified
Future risk	No data	No data	No data	No evidence of impact of climate change on frequency of floods, while trends of discharge are slightly declining. Average sea level and frequency of floods is expected to increase ⁽²⁾	No data	Not specified
References: ¹ GHK (2006); ² IPCDR (2012)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Upgrade of the system for monitoring and analysing the water environment in Slovenia (BOBER)	€32.7 million ^{(1)*}	€27.8 million ^{(1)*}	European Union Cohesion Fund ⁽¹⁾⁽²⁾	None reported		

SLOVENIA		Between 2002 and 2013, for the 7 floods recorded the total direct costs were €1,500 million (damages found for 5 out of 7 floods, damages extrapolated across all 7 floods). The average cost per flood was €220 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
References: ¹ European Commission (2013); ² European Regional Development Fund (nd)					
Assumptions and caveats: * These figures relate to five project components, one of which refers to the development and installation of flood forecasting systems for the Sava and Soča Rivers.					
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits
Upgrade of the system for monitoring and analysing the water environment in Slovenia (BOBER)	Areas prone to flooding along the Sava and Soča Rivers ⁽¹⁾	No data	No data	No data	The project should contribute to decreasing response times to flood disasters, whilst enabling better flood predictions and preparation, thus reducing financial costs for society ⁽¹⁾
References: ¹ European Commission (2013)					
Project	Grey	Green	Soft	Planned or delivered	
Upgrade of the system for monitoring and analysing the water environment in Slovenia (BOBER)	None reported	None reported	Constructing new or upgrading existing precipitation stations and weather radar and installing flood forecasting systems for the Sava and Soča Rivers ⁽¹⁾	No data	
References: ¹ European Commission (2013); ² European Regional Development Fund (nd)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Upgrade of the system for monitoring and analysing the water environment in Slovenia (BOBER)	None reported	Improved monitoring should allow better management of resources ⁽¹⁾	None reported	None reported	None reported
References: ¹ European Commission (2013)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
1	0
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Ecotoolkit					x	x										
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	106,236	
SMEs taking actions to improve resource efficiency		
	SI	EU28
Measures to save energy	40%	67%
Measures to minimise waste	40%	67%
Measures to save water	32%	51%
Measures to save materials	27%	59%
Many measures	6%	35%
No measures	13%	6%
Comprehensive systems for energy efficiency	3%*	4.26%*
Benefitting from public support for measures	6%	9%
Source: Eurobarometer Flash Survey 381, SBA Fact Sheets, EC (2013), SBA Fact Sheets (2012) *2006-9		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	8,001	14,288	19,481	10,290
Energy savings (kwh/year)	401,305	453,075	15,013	253,614
CO2 savings (tonnes/year)	306	182	6	90

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Savings in waste (tonnes/year)	11	40	2,334	260
Savings in raw materials (tonnes/year)	54	17,630	423	737
Savings in water (m ³ /year)	26	599	5	19

Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses> accessed on 31 January 2014

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€million)				
Category	Expenditure in 2010		Change between 2008 and 2010	
	Public	Private	Public	Private
Total	293	388	-2.5%	-27.9%
Breakdown by category:				
Protection of ambient air and climate	0	109	unavailable	-15%
Wastewater management	181	95	29.3%	-42.6%
Waste management	61	140	-27.4%	-10%
Protection and remediation of soil, groundwater and surface water	unavailable	11.4	Unavailable	-60.3%
Noise and vibration abatement	unavailable	14.1	Unavailable	-34.1%
Protection of biodiversity and landscapes	33.1	6.3	88%	-49.2%
Protection against radiation	unavailable	unavailable	unavailable	unavailable
Research and development for environmental protection	unavailable	unavailable	unavailable	unavailable
Other environmental protection activities	17.9	12.9	-69.7%	-52.9%

Source:

DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.

Notes:

Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O). Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable

Environmental expenditure for latest year for which data are available (€million)		
Category	2010	EU average for 2010
Public environmental expenditure as percentage of total public expenditure	1.63%	1.38%
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014	
Total environmental expenditure as percentage of GDP	2010	EU average for 2010
	2.33%	2.3%
Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014		Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
	2011	EU total for 2011
Number of jobs in the environmental goods and services sector (1000s)	Unavailable	4,194
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Eco-Innovation fund⁽¹⁾; Life+⁽²⁾; European funds (ERDF, CF & IPA)⁽³⁾; The European Fisheries Fund⁽⁴⁾; The European Agricultural Fund for Rural Development⁽⁵⁾</p> <p>Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-projects.eu/eco/page/Page.jsp on 1 December 2013. ² Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ³ European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_reg=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013. ⁴ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁵ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

Spain				Between 2002 and 2013, for the 23 floods recorded the total direct costs were €2,800 million (damages found for 12 out of 23 floods, damages extrapolated across all 23 floods). The average cost per flood was €120 million. Note this only includes floods that exceed the thresholds for inclusion in the EM-DAT database, many floods have occurred but it is unclear whether these exceed the thresholds as no quantified data were available
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€20 ⁽¹⁾	8 ⁽¹⁾	50 ⁽²⁾	
2003	N/Q	4 ⁽³⁾	No data	
2004	€73 ⁽⁴⁾	3 ⁽³⁾	No data	An estimated 600 people were affected ⁽²⁾
2005	€21 ⁽⁵⁾	4 ⁽³⁾	No data	4,000 houses and 1,500 cars were damaged in the Catalonia region of Spain ⁽⁵⁾
2006	N/Q	No data	No data	300 people displaced ⁽³⁾
2007	€248 ⁽⁶⁾	5 ⁽²⁾	No data	100,000 ha of vineyards flooded in Castilla La Mancha and 500,000 ha crops damaged by flood ⁽³⁾
2009	N/Q	3 ⁽⁷⁾	No data	26 houses were affected in Las Pachecas and 2 homes were swept away in Granada ⁽⁸⁾
2010	€710 ⁽⁹⁾	36 ⁽³⁾	No data	30 people were affected by flooding ⁽²⁾
2011	N/Q	2 ⁽¹⁰⁾	2 ⁽¹⁰⁾	2,400 people were affected by flooding ⁽²⁾
2012	€409 ⁽¹¹⁾	13 ⁽¹¹⁾	35 ⁽²⁾	An estimated 600 people were affected ⁽²⁾ and 120 displaced ⁽³⁾
2013	€6 ⁽¹²⁾	3 ⁽¹³⁾	No data	600 people were affected ⁽²⁾ and over 300 displaced ⁽³⁾
References and sources of information: ¹ Cana L et al (2003); ² CRED (nd); ³ DFO (nd); ⁴ Ministerio de Economía y Hacienda (2004); ⁵ Barrera A et al (2007); ⁶ Ministry of the Economy and Finance (Spain) (2007); ⁷ BBC News (2009); ⁸ The Olive Press (2009); ⁹ Ministerio de Economía y Hacienda (2010); ¹⁰ BBC News (2011); ¹¹ Ministerio de Hacienda y Administraciones Públicas (2012); ¹² The Olive Press (2013); ¹³ naturaldisastersnews.net (2013)				
Assumptions and caveats: Only floods for which information has been found have been used, those on CRED (nd) used as a baseline. As noted above, many floods have occurred but these have not been included as there were no data suggesting these exceeded the thresholds used for identifying what counts as a flood within this study for consistency across Member States; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity Fund				Between 2002 and 2013, €0 million was received. Total direct damages were €1,276 million. 5 applications were received and 5 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2004	€73	Rejected	Regional flooding Malaga	

Spain				Between 2002 and 2013, for the 23 floods recorded the total direct costs were €2,800 million (damages found for 12 out of 23 floods, damages extrapolated across all 23 floods). The average cost per flood was €120 million. Note this only includes floods that exceed the thresholds for inclusion in the EM-DAT database, many floods have occurred but it is unclear whether these exceed the thresholds as no quantified data were available		
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund		
2007	€18	Rejected	Regional flooding El Hierro			
	€66	Rejected	Regional flooding La Mancha			
2010	€710	Rejected	Regional Flooding Andalucia			
2012	€409	Rejected	Regional flooding Andalucia, Murcia, Valencia			
References: Inforegio (2013); European Commission (2012)						
Investments made				Between 1998 and 2015, €12,997 million was invested in flood risk management measures, equivalent to €764 million per year on average. €12 billion was from EU funds (but not all of this total may have been used for flood risk management)		
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats: Costs have not been normalised		
2008	€63	No data	No data	Coastal flooding and erosion protection ⁽¹⁾		
1998-2015	€935	No data	No data	Total expenditure on coastal protection (flooding and erosion) ⁽¹⁾		
2007-2013	-	€12,000	Cohesion Fund	Investments in R&D, innovation, entrepreneurship, transport and environmental projects ⁽²⁾ . Limited/no data on specific allocation from other funds		
References: ¹ Policy Research Corporation (2009); ² European Union Cohesion Policy (nd)						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	No data	Average number of people affected per flood event (1953 to 2005) of 38,645 of which 316 are made homeless ⁽¹⁾	No data	Average damages per flood event (1953 to 2005) of US\$400,000 (€300,000*) ⁽¹⁾	No data	Not specified

Spain		Between 2002 and 2013, for the 23 floods recorded the total direct costs were €2,800 million (damages found for 12 out of 23 floods, damages extrapolated across all 23 floods). The average cost per flood was €120 million. Note this only includes floods that exceed the thresholds for inclusion in the EM-DAT database, many floods have occurred but it is unclear whether these exceed the thresholds as no quantified data were available				
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Future risk	Area at risk of coastal flooding in Basque Country projected to increase by more than 3 times ⁽²⁾	No data	No data	No data	No data	2100 ⁽²⁾
	The Ebro and Llobregat Deltas (Catalonia), Manga del Mar Menor (Murcia) and lagoons of Cabo de Gata, Cadiz Gulf and Doñana (Andalucia) are most at risk from a 0.5m sea level rise The Eastern Cantabria region could see 40% of its beaches at risk of flooding with a 0.5m sea level rise ⁽³⁾	No data	No data	No data	No data	Not specified ⁽³⁾
References: ¹ GHK (2006); ² Marcos M et al (2012); ³ PNACC (2008)						
Assumptions and caveats: * using exchange rate of 1US\$ = €0.740159 (2006 exchange rate)						
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
AQUAVAL retrofitted SUDS in Valencia	€1.2 million ⁽¹⁾	€1.2 million ⁽¹⁾	EU LIFE programme ⁽¹⁾	None reported		
References: ¹ Perales-Momparler et al (2013)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
AQUAVAL retrofitted SUDS in Valencia	The municipalities of Xàtiva and Benaguasill within the province of Valencia ⁽¹⁾	No data	No data	No data	Management of rain water to reduce flood risk, prevent sewage overflow to improve water quality within the Albaida and Turia rivers and creation of green spaces ⁽¹⁾	
References: ¹ Perales-Momparler et al (2013)						

Spain		Between 2002 and 2013, for the 23 floods recorded the total direct costs were €2,800 million (damages found for 12 out of 23 floods, damages extrapolated across all 23 floods). The average cost per flood was €120 million. Note this only includes floods that exceed the thresholds for inclusion in the EM-DAT database, many floods have occurred but it is unclear whether these exceed the thresholds as no quantified data were available			
Project	Grey	Green	Soft	Planned or delivered	
AQUAVAL retrofitted SUDS in Valencia	Re-paving of areas with porous concrete ⁽¹⁾	Construction of retention-infiltration basins, wetland areas, vegetated swales and installation of green roofs ⁽¹⁾	None reported	Delivered	
References: ¹ Perales-Momparler et al (2013)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
AQUAVAL retrofitted SUDS in Valencia	Creation of bio-retention zones and green roofs is considered to enhance local biodiversity ⁽¹⁾	Prevention of sewage overflow will improve water quality within the Albaida and Turia rivers ⁽¹⁾	None reported	Measures will reduce the frequency of overflows from each of the towns sewage networks ⁽²⁾	Reduction of flood risk from rain water
References: ¹ Perales-Momparler et al (2013); ² European Commission (2013)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
15	10
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
CECO2PYME							x				x			x		
CEPYME Aragón (Web Ambiental)				x			x									
Club EMAS											x					x
Compromiso Zaragoza PYME Ambiental				x		x	x									
ECODES (website)				x												
EkoScan										x	x					x
Enerline																
Gipuzkoa Plan de Energía 2012-2015 (Industrial SMEs)			x								x					
IHOBE Corporation			x		x			x						x	x	x
Programa Ecoeficiencia en la empresa Vasca (2010-2014)					x						x			x		
Impulsando PYMEs				x									x			
Lineambiental.es website				x												
PINE Project (Promoting Industrial Energy Efficiency)			x													
Plan de uso sostenible de la energía y prevención del cambio climático de la ciudad de Madrid 2008-2012			x													
Portal PYME (Ministerio de Industria, Energía y Turismo (Secretaría General de Industria y De La Pequeña y Mediana Empresa))				x												
Programa e+5		x														x
Proyecto Asoclym						x						x				
Proyecto CHANGE			x	x							x	x				x
Proyecto de Sensibilización y Fomento				x		x										

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
del Ahorra y la Eficiencia Energética																
Proyecto Energypyme (Programa para la optimización del uso de la energía en la PYME)					x	x										
PYMEverde				x		x				x						
SUSTEEN Project			x		x						x			x		
The Environment Foundation				x	x					x		x				
Ecofood/Ecofood-SME					x						x					
Proyecto ENECO											x	x				
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	2,243,120	
SMEs taking actions to improve resource efficiency		
	ES	EU28
Measures to save energy	91%	67%
Measures to minimise waste	85%	67%
Measures to save water	78%	51%
Measures to save materials	91%	59%
Many measures	64%	35%
No measures	2%	6%
Comprehensive systems for energy efficiency	4%	4.26%
Benefitting from public support for measures	7%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	9,817	17,533	23,904	12,626
Energy savings (kwh/year)	376,228	424,763	14,075	237,766
CO2 savings (tonnes/year)	287	171	6	84
Savings in waste	19	68	4016	447

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
(tonnes/year)				
Savings in raw materials (tonnes/year)	67	21,634	519	904
Savings in water (m ³ /year)	22	513	5	16

Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses> accessed on 31 January 2014

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€million)				
Category	Expenditure in 2010		Change between 2008 and 2010	
	Public	Private	Public	Private
Total	3,191	5,220	0.16%	-10.6%
Breakdown by category:				
Protection of ambient air and climate	unavailable	643	unavailable	-44%
Wastewater management	unavailable	1057	unavailable	2.29%
Waste management	unavailable	2573	unavailable	4.66%
Protection and remediation of soil, groundwater and surface water	unavailable	172	unavailable	-10%
Noise and vibration abatement	unavailable	38	unavailable	-11%
Protection of biodiversity and landscapes	1825	268	5.8%	-12.5%
Protection against radiation	unavailable	unavailable	unavailable	unavailable
Research and development for environmental protection	unavailable	unavailable	unavailable	unavailable
Other environmental protection activities	1366	469	-6.5%	-5.06%

Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.

Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).

Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable

Category	2010	EU average for 2010
Public environmental expenditure as percentage of total public	0.66%	1.38%

Public environmental protection expenditure data are sourced from DG ESTAT, accessed at:

Environmental expenditure for latest year for which data are available (€million)		
expenditure	http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014	
Total environmental expenditure as percentage of GDP	2010	EU average for 2010
	1.9%	2.3%
	Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014	Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2011	EU total for 2011
	Eurostat data unavailable	4,194
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Eco-Innovation fund⁽¹⁾; INTERREG IVC⁽²⁾; Life+⁽³⁾; European funds (ERDF, CF & IPA)⁽⁴⁾; The European Fisheries Fund⁽⁵⁾; The European Agricultural Fund for Rural Development⁽⁶⁾</p> <p>Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-projects.eu/eco/page/Page.jsp on 1 December 2013. ² INTERREG IVC (nd): Approved Projects Database, accessed at: http://www.interreg4c.eu/projects/ on 29 November 2013. ³ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ⁴ European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at:</p>

Environment related EU funding

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1.1 Financial, economic and social costs of floods

SWEDEN				Between 2002 and 2013, for the 1 flood recorded the total direct costs were €320 million. The average cost per flood was €320 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2005	€323 ^(1, a)	9 ^(2, b)	No data	5 nuclear power plants forced to close when saltwater was blown into electricity distribution plants ^(2, b)
References and sources of information: ¹ Carpenter G (2005); ² Haanpää S et al (2006)				
Assumptions and caveats: ^a costs for storm damage, mainly wind related ^b not just from flooding Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, no applications to the EU Solidarity fund were made
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats:
No applications				
References: Inforegio (2013); European Commission (2012)				
Investments made				Between 2002 and 2013, €289 million was invested in flood risk management measures, equivalent to €26 million per year on average. €183 million was from EU funds (but not all of this total may have been used for flood risk management)
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:
1980s to 2005	€34	No data	No data	Between the 1980s and 2005 €1.68 million was invested per year as the annual budget for assisting municipalities with preventative measures against natural disasters ⁽¹⁾
2007 to 2009	€5.4	No data	No data	€2.68 million was invested per year as a temporary increase to appropriation by Government ⁽¹⁾
2008	€9.5	No data	No data	Total expenditure on coastal protection (flooding and erosion) ⁽²⁾
1998-2015	€127	No data	No data	
2006-ongoing	€0.55 per year	No data	No data	Investment in Ystrad for ad hoc measures ⁽²⁾
2007-2013	-	€183	Cohesion Fund	Protecting the environment and promoting sustainable growth ⁽³⁾
References: ¹ SCCV (2007); ² Policy Research Corporation (2009); ³ European Union Cohesion Policy (nd)				

SWEDEN			Between 2002 and 2013, for the 1 flood recorded the total direct costs were €320 million. The average cost per flood was €320 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	No data	No data	Around 6 million m ² of floor area in buildings is at risk on a 1:100 flood, much of this is low and detached buildings. There are around 120,000 buildings located within 100m of the shoreline ⁽¹⁾	A 1:100 flood across all mapped watercourses would result in total damages to buildings of SEK18.5 billion (€2 billion*), or about SEK2.3 million (€0.2 million*) per watercourse km. Value of building areas under the 5m level total SEK 164.1 billion (€18 billion*) (based on a model from the insurance industry).. Of all flood damage reported by insurance companies, 75-80% concerns flooding from backflow of water via the waste water system ⁽¹⁾	Not specified	2005
Future risk	No data	No data	An estimated 152,900 buildings are at risk from erosion with sea level rise of 88cm ⁽¹⁾	An estimated SEK224.4 billion (€24 billion*) of property and farmland is at risk from erosion (2005 values) with sea level rise of 88cm ⁽¹⁾	Not specified	2071-2100
References: ¹ SCCV (2007)						
Assumptions and caveats: * using exchange rate of 0.108 SEK to €1 (2007 exchange rate)						
Estimated investment need to cover increases in risk into the future		€1,034 million per year needed to protect roads and buildings from flooding and erosion				
Year	Investments needed	Assumptions and caveats:				
1994-2006	€12,407 million	Damage to roads from flooding and erosion (€7 million), increasing to €5-€11 million in the long term. Damage to buildings (€2 billion). Combined cost of flooding under Low scenario of €8.8 billion to €12 billion (SEK80 billion to high scenario SEK140 billion) (mid value taken). Combined cost for flooding of buildings and flooding of the major lakes, which include effects				

SWEDEN		Between 2002 and 2013, for the 1 flood recorded the total direct costs were €320 million. The average cost per flood was €320 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
		on several sectors of society ⁽¹⁾			
References: SVVC (2007)					
Case study examples: costs and benefits of projects					
Project	Investment made	EU funds	Funding source	Other sources	
Ekostaden Augustenborg Flood Prevention (Malmo)	SEK 200 million (€23 million) ^(1, 2)	SEK 6 million (€680,000) from the EU LIFE programme	Swedish Government, EU LIFE Funds, MKB (Malmo's Public Housing Company)	None reported	
References: ¹ Kazmierczak A & Carter J (2010); ² Malmo Stad (nd)					
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits
Ekostaden Augustenborg Flood Prevention (Malmo)	Augustenborg (district of Malmo)	No data	No data	No data	Reduced flood risk and increase in habitat, biodiversity (by 50%), green spaces and recreational areas ^(1, 2, 3)
References: ¹ Kazmierczak A & Carter J (2010); ² Malmo Stad (nd); ³ DAC & Cities (2014)					
Project	Grey	Green	Soft	Planned or delivered	
Ekostaden Augustenborg Flood Prevention (Malmo)	Open storm water system (including canals and ponds) ⁽¹⁾	Creation of ponds and wetlands to act as storage areas for rain water (increase in green spaces). Green roofs have been installed on all developments built post 1998 to intercept rain water and aid in flood prevention ^(1, 2)	None reported	Delivered	
References: ¹ Kazmierczak A & Carter J (2010); ² City of Malmo (2013)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Ekostaden Augustenborg Flood Prevention (Malmo)	Creation of ponds, wetlands and installation of green roofs has increased habitat and biodiversity of the area. The world's first	The increased capacity of the new open SUDS should prevent the sewage drainage system from flooding and thus	None reported	The green roofs provide insulation and reduce urban heat islands ⁽³⁾	None reported

SWEDEN		Between 2002 and 2013, for the 1 flood recorded the total direct costs were €320 million. The average cost per flood was €320 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)			
	Botanical Roof Garden is estimated to have increased biodiversity by 50%. Recreational green spaces have also been created for residents ^(1, 2)	prevent untreated from entering watercourses ⁽¹⁾			
References: ¹ Kazmierczak A & Carter J (2010); ² DAC & Cities (2014); ³ City of Malmo (2013)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified	
General information provision	Direct, hands-on support
3	3
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Environment-driven business development			x	x												
Forska & Väx (Research & Grow)									x							
Hackefors model												x		x		x
The Environment Diploma		x								x						x
The Production Leap				x				x	x	x				x		
VINN NU									x							
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	672,401	
SMEs taking actions to improve resource efficiency		
	SE	EU28
Measures to save energy	59%	67%
Measures to minimise waste	61%	67%
Measures to save water	29%	51%
Measures to save materials	58%	59%
Many measures	29%	35%
No measures	7%	6%
Comprehensive systems for energy efficiency	7%	4.26%
Benefitting from public support for measures	9%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	10,545	18,832	25,676	13,562
Energy savings (kwh/year)	287,249	324,305	10,746	181,534
CO2 savings (tonnes/year)	219	130	4	64
Savings in waste (tonnes/year)	28	99	5,840	651
Savings in raw materials (tonnes/year)	72	23,237	557	971
Savings in water (m ³ /year)	91	2,097	18	65
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€million)				
Category	Expenditure in 2011		Change between 2008 and 2011	Change between 2009 and 2011
	Public	Private	Public	Private
Total	1,307	1,394	12.4%	42%
Breakdown by category:				
Protection of ambient air and climate	3.77	357	-39.6%	64.6%
Wastewater management	0.44	429.86	-53.19%	45%
Waste management	742	287	0.27%	32%
Protection and remediation of soil, groundwater and surface water	unavailable	unavailable	unavailable	unavailable
Noise and vibration abatement	unavailable	unavailable	unavailable	unavailable
Protection of biodiversity and landscapes	131	no data	5.5%	unavailable

Environmental expenditure for latest year for which data are available (€million)				
Category	Expenditure in 2011		Change between 2008 and 2011	Change between 2009 and 2011
	Public	Private	Public	Private
Protection against radiation	unavailable	unavailable	unavailable	unavailable
Research and development for environmental protection	unavailable	unavailable	unavailable	unavailable
Other environmental protection activities	430	320	47.8%	26.6%
<p>Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.</p> <p>Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).</p> <p>Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable</p>				
Category	2011		EU average for 2011	
Public environmental expenditure as percentage of total public expenditure	0.66%		1.3%	
	Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014			
Category	2011		EU average for 2011	
Total environmental expenditure as percentage of GDP	0.70%		2.3%	
	<p>Total environmental protection expenditure calculated by summing environmental protection expenditure by general government, business sector (all NACE activities except E37, E38.1, E38.2, E39 and O) and specialised producers of environmental protection services (E37, E38.1, E38.2 and E39) sourced from DG ESTAT accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014; GDP data sourced from DG ESTAT via http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014</p> <p>Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)</p>			

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2011	EU total for 2011
		Unavailable
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014.	
	Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Eco-Innovation fund⁽¹⁾; INTERREG IVC⁽²⁾; Life+⁽³⁾; The European Fisheries Fund⁽⁴⁾; The European Agricultural Fund for Rural Development⁽⁵⁾</p> <p>Sources: ¹ European Commission (nd): Eco-innovation, accessed at: http://www.eaci-projects.eu/eco/page/Page.jsp on 1 December 2013. ² INTERREG IVC (nd): Approved Projects Database, accessed at: http://www.interreg4c.eu/projects/ 29 November 2013. ³ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014. ⁴ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fisheries_fund_en.pdf on 17 January 2014. ⁵ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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1.1 Financial, economic and social costs of floods

UK – England, Scotland, Wales, Northern Ireland				Between 2002 and 2013, for the 22 floods in England, 10 floods in Northern Ireland, 6 floods in Scotland and 10 floods in Wales recorded the total direct costs were €23,000 million (damages found for 16 out of 22 floods, damages extrapolated across all 48 floods). The average cost per flood was €480 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Damages (€million)	Fatalities	Injuries	Qualitative information (direct and indirect damages, and knock-on effects: economic and social disruption)
2002	€1.6 ⁽¹⁾	No data	No data	750 people affected ^(12, a)
2003	N/Q	No data	No data	20 residents evacuated ⁽¹⁹⁾
2004	€738 ^(2, a)	8 ⁽¹²⁾	No data	58 properties flooded ⁽²⁾
2005	€365 ^(3, b)	5 ⁽¹³⁾	100 ⁽³⁾	1,800 properties flooded ⁽²⁰⁾
2007	€4,770 ⁽⁴⁾	14 ⁽¹²⁾	No data	Jun 24,000 residential properties seriously flooded and an additional 15,500 in July ⁽²⁰⁾
2008	€12 ^(5, c)	8 ⁽¹²⁾	No data	55,000 homes flooded ⁽²⁾
2009	€310 ⁽⁶⁾	4 ⁽⁵⁾	No data	Severe health concerns and difficulties for the care of vulnerable groups and for the welfare of animals in Northern Ireland ⁽¹³⁾
2010	€23 ⁽⁷⁾	No data	No data	Hundreds of people evacuated ⁽¹³⁾
2011	N/Q	No data	2 ⁽¹⁵⁾	
2012	€1,480 ^(8, a)	9 ⁽¹⁶⁾	3 ⁽¹⁷⁾	816 homes flooded ⁽¹⁷⁾
2013	€0.2 ^(9, 10, 11)	5 ⁽¹⁸⁾	No data	1,200 homes flooded ⁽²¹⁾
References and sources of information: ¹ Camden Sustainability Team (2013); ² Lumbroso D & Vinet F (2012); ³ Carpenter G (2005); ⁴ Environment Agency (2010); ⁵ NERC (nd); ⁶ BBC News Cumbria (2010); ⁷ RMS (2013); ⁹ Bale D (2013); ¹⁰ EDP Reporters (2013); ¹¹ Carroll A (2013); ¹² CRED (nd); ¹³ Rivers Agency (2011); ¹⁵ Davies C (2011); ¹⁶ Penning-Rowse E (2013); ¹⁷ BBC News (2012); ¹⁸ Macgregor L (2013); ¹⁹ The Royal Windsor Website (2003); ²⁰ Environment Agency (nd); ²¹ BBC News (2013)				
Assumptions and caveats: ^a costs cover the whole UK ^b costs for storm damage, mainly flood related ^c costs include England and Wales Only floods for which information has been found have been used, those on CRED (nd) used as a baseline; damages estimated using extrapolation are rounded to two significant figures to reflect uncertainty; costs have not been normalised				
EU Solidarity fund				Between 2002 and 2013, €162 million was received from the EU Solidarity Fund. Total direct damages were €4,612 million. 1 application was accepted and 0 rejected
Year	Total direct damage (€million)	Funds received (€million)	Reason(s) for application	Assumptions and caveats: Costs have not been normalised Total direct damages are taken from the applications to the EU Solidarity Fund
2007	€4,612	€162.387	Major Flooding	Whole of UK
References: Inforegio (2013); European Commission (2012)				

UK – England, Scotland, Wales, Northern Ireland				Between 2002 and 2013, for the 22 floods in England, 10 floods in Northern Ireland, 6 floods in Scotland and 10 floods in Wales recorded the total direct costs were €23,000 million (damages found for 16 out of 22 floods, damages extrapolated across all 48 floods). The average cost per flood was €480 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Investments made				
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:
UK-All	€1.6 billion was from EU funds			
2007-2013	-	€1,600	Cohesion Fund	Protecting the environment, managing natural resources and combating the negative effects of climate change
References: European Union Cohesion Policy (nd)				
England	Between 2010 and 2013, €998 million (based on equal spending per year for projects over a period of time) was invested in flood risk management measures, equivalent to €333 million per year on average			
2011-2015	€2,700	No data	No data	Total for flooding and erosion ⁽¹⁾ Exchange rate for mid-year (2013) GBP/EUR 0.84926 ⁽²⁾
	€175	No data	No data	Expected from private and council funding ⁽¹⁾ Exchange rate for mid-year (2013) GBP/EUR 0.84926 ⁽²⁾
	€141	No data	No data	Additional funding announced 2012 (capital projects) ⁽¹⁾ Exchange rate for mid-year (2013) GBP/EUR 0.84926 ⁽²⁾
2012-2013	€328	No data	No data	Capital funding ⁽¹⁾ Exchange rate for 2012 used GBP/EUR 0.81087 ⁽²⁾
2012-2013	€363	No data	No data	Revenue funding ⁽¹⁾ Exchange rate for 2012 used GBP/EUR 0.81087 ⁽²⁾
2010-2011	€117	No data	No data	Environment Agency's regional revenue maintenance budget ⁽¹⁾ Exchange rate for 2010 used GBP/EUR 0.85784 ⁽²⁾
2012-2013	€85	No data	No data	Asset management spend ⁽¹⁾ Exchange rate for 2012 used GBP/EUR 0.81087 ⁽²⁾
References: ¹ HM Government (2013); House of Commons Environment Food and Rural Affairs Committee (2013); ² Eurostat (nd)				
Scotland	Between 2002 and 2008, €350 million was invested in flood risk management measures, equivalent to €58 million per year on average			
2002-2003	€8.1	No data	No data	Government grants paid out for flood risk management (50% to 2004 and 80% thereafter). Expenditure made by Local Authorities Exchange rate GBP/EUR 0.62883 (2002)
	€17	No data	No data	Total value of flood protection schemes (i.e. total cost of new flood prevention schemes when approved by the Minister and when work started) Exchange rate GBP/EUR 0.62883 (2002)

UK – England, Scotland, Wales, Northern Ireland				Between 2002 and 2013, for the 22 floods in England, 10 floods in Northern Ireland, 6 floods in Scotland and 10 floods in Wales recorded the total direct costs were €23,000 million (damages found for 16 out of 22 floods, damages extrapolated across all 48 floods). The average cost per flood was €480 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:
2003-2004	€8.1	No data	No data	Government grants paid out for flood risk management (50% to 2004 and 80% thereafter). Expenditure made by Local Authorities Exchange rate GBP/EUR 0.69199 (2003)
	€5.8	No data	No data	Total value of flood protection schemes (i.e. total cost of new flood prevention schemes when approved by the Minister and when work started) Exchange rate GBP/EUR 0.69199 (2003)
2004-2005	€11.5	No data	No data	Government grants paid out for flood risk management (50% to 2004 and 80% thereafter). Expenditure made by Local Authorities Exchange rate GBP/EUR 0.67866 (2004)
	€2.0	No data	No data	Total value of flood protection schemes (i.e. total cost of new flood prevention schemes when approved by the Minister and when work started) Exchange rate GBP/EUR 0.67866 (2004)
2005-2006	€6.9	No data	No data	Government grants paid out for flood risk management (50% to 2004 and 80% thereafter). Expenditure made by Local Authorities Exchange rate GBP/EUR 0.68380 (2005)
2006-2007	€13	No data	No data	Government grants paid out for flood risk management (50% to 2004 and 80% thereafter). Expenditure made by Local Authorities Exchange rate GBP/EUR 0.68173 (2006)
	€99	No data	No data	Total value of flood protection schemes (i.e. total cost of new flood prevention schemes when approved by the Minister and when work started) Exchange rate GBP/EUR 0.68173 (2006)
2007-2008	€47	No data	No data	Government grants paid out for flood risk management (50% to 2004 and 80% thereafter). Expenditure made by Local Authorities Exchange rate GBP/EUR 0.68434 (2007)
	€131	No data	No data	Total value of flood protection schemes (i.e. total cost of new flood prevention schemes when approved by the Minister and when work started) Exchange rate GBP/EUR 0.68434 (2007)
References: Scottish Parliament (2010)				
Wales	Between 2009 and 2010, €36 million was invested in flood risk management measures			
2009-2010	€36	No data	No data	Maintenance Exchange rate GBP/EUR 0.89094 (2009)
References: Environment Agency Wales (2010)				

UK – England, Scotland, Wales, Northern Ireland				Between 2002 and 2013, for the 22 floods in England, 10 floods in Northern Ireland, 6 floods in Scotland and 10 floods in Wales recorded the total direct costs were €23,000 million (damages found for 16 out of 22 floods, damages extrapolated across all 48 floods). The average cost per flood was €480 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
Northern Ireland	Between 2011 and 2014, €16.60 million was invested in flood risk management measures, equivalent to €5.5 million per year on average					
Year	Investments made (€million)	EU funds received (€million)	EU funds	Assumptions and caveats:		
2011-2012	€0.3	No data	No data	Floods Directive implementation ⁽¹⁾ Exchange rate GBP/EUR 0.86788 (2011) ⁽²⁾		
	€4.7	No data	No data	Flood defence capital works and drainage infrastructure ⁽¹⁾ Exchange rate GBP/EUR 0.86788 (2011) ⁽²⁾		
2012-2013	€0.5	No data	No data	Floods Directive implementation ⁽¹⁾ Exchange rate GBP/EUR 0.81087 (2012) ⁽²⁾		
	€4.6	No data	No data	Flood defence capital works and drainage infrastructure ⁽¹⁾ Exchange rate GBP/EUR 0.81087 (2012) ⁽²⁾		
2013-2014	€0.6	No data	No data	Floods Directive implementation ⁽¹⁾ Exchange rate GBP/EUR 0.84926 (2013) ⁽²⁾		
	€5.9	No data	No data	Flood defence capital works and drainage infrastructure ⁽¹⁾ Exchange rate GBP/EUR 0.84926 (2013) ⁽²⁾		
References: ¹ DARD (2011); ² European Central Bank (ECB) (nd)						
England						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	No data	64,000 people in the south east are at significant risk of flooding. The south east also has the highest number of people (460,000) at moderate or significant chance of flooding ⁽¹⁾	458,000 of the at-risk properties are in London, although 84% are in areas with a low chance (<1:200) of flooding ⁽¹⁾ . 2.4 million homes at risk of river flooding and 2.8 million at risk of surface water flooding ⁽²⁾ , with 1 million threatened by both ⁽²⁾	No data	1:200 or greater ⁽¹⁾	2007-2008
Future risk	No data	No data	The number of properties at significant risk of	Annual economic damages could increase to	Not specified	2035-2080s

UK – England, Scotland, Wales, Northern Ireland				Between 2002 and 2013, for the 22 floods in England, 10 floods in Northern Ireland, 6 floods in Scotland and 10 floods in Wales recorded the total direct costs were €23,000 million (damages found for 16 out of 22 floods, damages extrapolated across all 48 floods). The average cost per flood was €480 million (based on those floods that are sufficient to exceed the threshold for inclusion in the EM-DAT database)		
			flooding could increase by 350,000 (rivers and seas) ⁽¹⁾	between £1 billion and £21 billion ⁽³⁾		
References: ¹ Environment Agency (2009); ² House of Commons EFRA Committee (2013); ³ Environment Agency (2009a) and Environment Agency (2009)						
Scotland						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	243 potentially vulnerable areas have been identified ⁽¹⁾	No data	1:22 residential properties 1:13 non-residential properties ⁽²⁾ . The potentially vulnerable areas contain 92% of the total number of properties at risk in Scotland ⁽¹⁾	£720 to 850 million average annual damages ⁽²⁾ . River flooding accounts for approx. 45% of all predicted impacts Coastal flooding accounts for approx. 17% Surface water flooding account for approx. 28% ⁽¹⁾	Not specified	Not specified
Future risk						No data
References: ¹ SEPA & Natural Scotland (2012); ² SEPA (2011)						
Wales						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	No data	357,000 people at risk (1 in 9 of the population) (flooding from rivers and the sea) 97,000 at significant likelihood of flooding 119,000 at moderate likelihood of flooding	220,000 at risk of flooding from rivers or the sea 65,000 at significant likelihood of flooding 73,000 at moderate likelihood of flooding 82,000 at low likelihood of flooding ⁽¹⁾	£200 million (flooding from rivers and the sea) ⁽¹⁾	Significant = >1:75 Moderate = 1:75 to 1:200 Low = <1:200 ⁽¹⁾	Not specified

		141,000 at low likelihood of flooding ⁽¹⁾				
Future risk	No data	No data	No data	No data	No data	No data
References: ¹ Environment Agency Wales (2010); Environment Agency Wales (2009)						
UK-Northern Ireland						
Flood risk	Area	No. people	No. properties	EAD	Flood event	Data for year
Current risk	No data	16,800 people at risk (all sources) 8,100 (fluvial) 1,800 (coastal) 6,700 (pluvial) ⁽¹⁾	46,000 (fluvial, coastal) 22,000 (pluvial) 5% of all properties ⁽¹⁾	£290.9 million (all sources) £116.8 million (fluvial) £33.4 million (coastal) £140.5 million (pluvial) ⁽¹⁾	1:100 fluvial floodplain 1:200 coastal floodplain ⁽¹⁾	Not specified
Future risk	No data	8,600 (fluvial) 2,000 (coastal) 9,100 (pluvial) ⁽¹⁾	£341.1 million (all sources) £123.7 million (fluvial) £36.4 million (coastal) £181 million (pluvial) ⁽¹⁾	No data	Not specified	2030
References: ¹ Rivers Agency (2011)						
Estimated investment need to cover increases in risk into the future		€19.8 to €26.81 billion per year needed to cover coastal flood annual damage costs to property in the absence of additional measures to control flood risk (in 2010 prices) or about €12.8 to 19.8 billion per year in 2060 assuming a linear increase in damage cost over time. Incremental flood damage costs were estimated at €0.58 to 4.43 billion for 2080				
Year	Investments needed	Assumptions and caveats:				
2060	€12.8-19.8 billion ⁽¹⁾	For UK as a whole and if no adaptive action is taken Exchange rate GBP/EUR 0.85784 (2010)				
2080	€0.58-4.43 billion ⁽¹⁾	For UK as a whole Incremental flood damage costs Exchange rate GBP/EUR 0.85784 (2010)				
Case study examples: costs and benefits of projects						
Project	Investment made	EU funds	Funding source	Other sources		
Medmerry managed realignment scheme	£20 million (€24 million) design and construction £9 million (€11 million) land purchase ⁽¹⁾	None reported	UK government ⁽²⁾	None reported		
References: ¹ Gilham & Maplesden (2013); ² Pearce (2010); ³ Higuchi et al (2013)						
Project	Location(s) benefiting	Damages avoided	Benefits	Benefit-cost ratio	Qualitative benefits	
Medmerry managed realignment scheme	Communities near Selsey on the South Coast of England ⁽³⁾	£5 million (€6 million) damages caused ⁽³⁾	£90 million direct benefits (€110 million) ⁽¹⁾	7 to 8 (based on PV costs of £11 to £12 million (€13 to €14 million)) ⁽²⁾	Protection of local communities from coastal flooding (including road links, a wastewater treatment works and electricity)	

					substations) and creation of intertidal habitats and recreational areas ⁽³⁾
References: ¹ Gilham & Maplesden (2013); ² Pearce (2010); ³ Higuchi et al (2013)					
Project	Grey	Green	Soft	Planned or delivered	
Medmerry managed realignment scheme	Realignment of the existing shingle bank and construction of a 7km earth embankment ⁽¹⁾	Formation of 183 ha of intertidal habitats and 80 ha of new transitional grassland ⁽¹⁾	None reported	Delivered	
References: ¹ Higuchi et al (2013)					
Project	Biodiversity, flora, fauna, landscape	Water quality and resources	Soil quality and resources	Waste production, generation, recycling	Likelihood of environmental risks
Medmerry managed realignment scheme	Creation of intertidal habitat and transitional grassland ⁽¹⁾	None reported	None reported	The scheme will help protect a wastewater treatment works ⁽¹⁾	None reported
References: ¹ Higuchi et al (2013)					

1.2 SMEs and resource efficiency

No. of SME support programmes for resource efficiency identified (United Kingdom)	
General information provision	Direct, hands-on support
10	10
Assumptions and caveats: Category assignment based on RPA's own classifications	

SME support programmes identified and services provided (United Kingdom)																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Energy Saving Trust				x		x			x							
Bright Green Business			x				x			x		x				x
Business Environment Coordinators			x				x		x		x					x

SME support programmes identified and services provided (United Kingdom)																
	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/ Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/Events	Networks	Study tours	Face-to-face consulting	Grants and consulting	Assistance to set up EM(A)S
Business Support (one includes Small Business Bonus Scheme)									X			X			X	
Carbon Trust			X	X		X	X		X							
Energy Entrepreneurs Fund							X		X							
Environmental Sustainability Knowledge Transfer Network								X			X	X				
Envirowise			X	X	X			X			X					
EnWorks			X	X						X	X					
Green Business Network				X						X	X					
'Green Tick' EMS																X
LEP Network (Local Enterprise Partnerships)				X	X			X				X				
London Re-use Network				X								X				
Low Carbon Funding website				X					X			X				
NetRegs				X												
NISP				X			X	X		X	X	X				
Resource Efficiency East			X			X		X								X
The Green Deal									X							
WRAP				X	X		X	X	X	X	X					
Zero Waste Scotland				X	X	X				X	X					
Assumptions and caveats: Based on RPA's own review of services provided																

Data on SMEs and resource efficiency for all of UK		
Total No. of SMEs (NACE Codes R.2 B-J, L,M,N)	1,620,388	
SMEs taking actions to improve resource efficiency		
	UK	EU28
Measures to save energy	79%	67%
Measures to minimise waste	94%	67%
Measures to save water	63%	51%
Measures to save materials	71%	59%
Many measures	55%	35%
No measures	0%	6%
Comprehensive systems for energy efficiency	3%	4.26%
Benefitting from public support for measures	17%	9%
Source: Eurobarometer Flash Survey (2013); SBA Fact Sheets (2012); SBA Fact Sheets (2013)		

Potential per firm savings resulting from provision of direct, hands-on support to SMEs to improve resource efficiency				
	Energy, power and utilities	Food and drink	Environmental technologies	Construction
Cost savings (EUR)	18,757	33,498	45,672	24,124
Energy savings (kwh/year)	420,366	474,595	15,726	265,660
CO2 savings (tonnes/year)	321	191	6	94
Savings in waste (tonnes/year)	17	62	3,668	409
Savings in raw materials (tonnes/year)	128	41,333	991	1,727
Savings in water (m ³ /year)	113	2,609	23	81
Source: Calculations based on realised savings from ENWORKS programme in UK from 2004-9 at: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses accessed on 31 January 2014				

1.3 Environmental expenditure

Environmental expenditure for latest year for which data are available (€million)				
Category	Expenditure in 2010		Change between 2008 and 2010	
	Public	Private	Public	Private
Total	Unavailable	3,773	Unavailable	-22%
Breakdown by category:				
Protection of ambient air and climate	Unavailable	439	Unavailable	-46%
Wastewater management	Unavailable	713	Unavailable	-47%
Waste management	Unavailable	1091	Unavailable	1.3%
Protection and remediation of soil, groundwater and surface water	Unavailable	372	Unavailable	300%
Noise and vibration abatement	Unavailable	439	Unavailable	1,900%

Environmental expenditure for latest year for which data are available (€million)				
Category	Expenditure in 2010		Change between 2008 and 2010	
	Public	Private	Public	Private
Protection of biodiversity and landscapes	Unavailable	134	Unavailable	-7.2%
Protection against radiation	Unavailable	Unavailable	Unavailable	Unavailable
Research and development for environmental protection	Unavailable	Unavailable	Unavailable	Unavailable
Other environmental protection activities	Unavailable	588	Unavailable	-55%
<p>Source: DG ESTAT, Environmental protection expenditure in Europe – detailed data (NACE Rev.2), accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014.</p> <p>Notes: Public data are environmental protection expenditure by general government; private data are environmental protection expenditure for the business sector (all NACE activities except E37, E38.1, E38.2, E39 and O).</p> <p>Data provided here are those which are publicly available through the DG ESTAT Internet site and present a snapshot of environmental protection expenditure. Collection of these environmental protection expenditure data is currently voluntary. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Additional national data are available (see main report), but are not reported here to avoid mixing data sources. Data from two or more Member States may not necessarily be comparable</p>				
Category	2011		EU average for 2011	
Public environmental expenditure as percentage of total public expenditure	Unavailable		1.3%	
	<p>Public environmental protection expenditure data are sourced from DG ESTAT, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp1r2&lang=en on 31 January 2014 and relate to environmental protection expenditure by general government. Total government expenditure figures are from Eurostat (2013): Annual Summary of Government Finance Statistics, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data on 31 January 2014</p>			
Total environmental expenditure as percentage of GDP	Unavailable		2.3%	
	<p>Percentage calculated by determining environmental protection expenditure for general government, industry and private and public specialised producers (based on GDP percentages provided by Eurostat, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_exp2&lang=en on 31 January 2014 and taking the total as a percentage of GDP (Eurostat GDP data, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database on 31 January 2014)</p>			

Environmental employment		
Number of jobs in the environmental goods and services sector (1000s)	2011	EU total for 2011
		Eurostat data unavailable
	Eurostat (2014): Employment in the environmental goods and services sector, accessed at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en on 30 January 2014. Notes: Data presented here are those which are publicly available through the DG ESTAT Internet site. Where data have been submitted to DG ESTAT but not yet published, they are not included here. Further data on employment may be available from national sources, but are not presented here to avoid mixing datasets	

Environment related EU funding	
EU environment funding received	<p>Funding received from the following sources: Eco-Innovation fund⁽¹⁾; INTERREG IVC⁽²⁾; Life+⁽³⁾; European funds (ERDF, CF & IPA)⁽⁴⁾; The European Fisheries Fund⁽⁵⁾; The European Agricultural Fund for Rural Development⁽⁶⁾</p> <p>Sources:</p> <p>¹ European Commission (nd): Eco-innovation, accessed at: http://www.ecaci-projects.eu/eco/page/Page.jsp on 1 December 2013.</p> <p>² INTERREG IVC (nd): Approved Projects Database, accessed at: http://www.interreg4c.eu/projects/ on 29 November 2013.</p> <p>³ Information sourced from Life Programme country factsheets available via the DG Environment Internet site, accessed at: http://ec.europa.eu/environment/life/countries/index.htm on 31 January 2014.</p> <p>⁴ European Commission (nd): Regional Policy – INFOREGIO. In your country. Programmes, accessed at: http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm?gv_pay=ALL&gv_re g=ALL&gv_obj=ALL&gv_the=72&gv_per=2 on 11 December 2013.</p> <p>⁵ European Commission (nd): European Fisheries Fund Fact Sheet, accessed at: http://ec.europa.eu/fisheries/documentation/publications/cfp_factsheets/european_fi sheries_fund_en.pdf on 17 January 2014.</p> <p>⁶ DG Agriculture and Rural Development (2008): Synthesis of Ex Ante Evaluations of Rural Development Programmes 2007-2013. Final Report, accessed at: http://ec.europa.eu/agriculture/eval/reports/rurdev/fulltext_en.pdf on 17 January 2014</p>

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Annex 2: Summary of flood occurrences and quantified data by Member State

Table A2-1: Flood occurrences												
Country	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Austria	1	1 (1)			2			1	1			1
Belgium			(1)	1			(1)		(1)	(1)	(1)	(4)
Bulgaria		1		(4)			(3)	(1)	3			1 (2)
Croatia		1		1 (2)				1	(1)			
Cyprus								(1)			(2)	
Czech Republic	1			2	1		(3)	1	(1)		(1)	1 (1)
Denmark	1		1						1			
Estonia									1		1	
Finland	(2)	1 (2)					1	(1)	1 (1)	1	(1)	
France	2	4	4	3	4	8	6	2	4		5	6
Germany	1		(2)	1 (1)	1		1	(1)	1		(1)	1
Greece	1	(2)		(2)	1		(5)	1 (2)	(3)		1	1 (3)
Hungary	1			1	(1)			1 (1)	1	(1)	(2)	1
Ireland		2	1		1 (1)	3		(2)	(1)	1	(1)	2 (1)
Italy	1	1	1	1 (1)	2	1 (1)	1	1	(1)	1	5	1 (1)
Latvia									1			
Lithuania				(2)			(1)		(2)			
Luxembourg												
Malta			(1)	(1)			(3)	(2)		(2)	1 (2)	(1)
Netherlands			1								2	
Poland	(2)			1 (1)	1			(2)	(2)	(1)		
Portugal	(1)			(1)		(1)		(3)			(1)	(1)
Portugal – Azores	(1)											

Table A2-1: Flood occurrences												
Country	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Portugal - Madeira		1		1								
Romania	1 (2)	1		1	1	1	2	1 (2)	2 (1)	1 (2)	1	1
Slovakia	1	1	1	2	3	1	1	3	4	4	1	2
Slovenia		2		1		(1)	1		1 (1)			
Spain	3	1 (1)	(1)	2 (1)	(2)		2 (2)	(1)	1	1	(3)	2
Sweden									1			
UK- England	1	2	(2)	1	1 (2)	5	3		1 (1)	1	(1)	1
UK- Northern Ireland		(1)	(1)		(2)	(1)	(1)		(1)	1		(2)
UK- Scotland	(1)	(1)						(1)	(1)		(1)	(1)
UK- Wales	(1)	(1)			(2)	(2)	(1)		(1)	(1)		(1)
Totals	15 (10)	19 (9)	9 (8)	19 (16)	18 (10)	19 (6)	18 (20)	12 (20)	24 (19)	11 (8)	17 (17)	21 (18)
Overall Total	25	28	17	35	28	25	38	32	43	19	34	39
Number of floods for which damages have been quantified (Number of floods for which damages have not been quantified)												

Annex 3: Areas at flood risk (current and future) by Member State

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
Austria	1,840km (5.% of total river length) Austrian part of Danube River Basin	Mainly due to number of residential properties and employees in flood prone areas			High or very high risk	Not specified	ICPDR (2012)
	400 APSFR with average length of 7km				More than half of APSFR are protected by structural defences up to a 30 year return period or higher	Not specified	ICPDR (2012)
			242,000 buildings (12% of total properties)		1:200 (if defences failed)	2005	Sinabell & Url (2008)
			19,000 buildings (8% of properties within 1:200 event)		1:30 (high risk)	2005	Sinabell & Url (2008)
	Approx. 3000 ha (6%) of building land in Styria				1:100	Not specified	Resch (2008)
Belgium – Brussels Capital Region	No data	2,857 insurance claims in 2005 ⁽¹⁾	Urban floods largely caused by heavy rainfall in summer with average occurrence of 1.5 floods per year ⁽²⁾	No data	No data	Not specified	LNE (2008); Mees D (2013)

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
			€2.4 million damages caused in 2005 ⁽¹⁾				
Belgium - Flanders		400,000 people (4% of the total population) live along the Belgian coast. This increases by 300,000 tourists during the summer			Not specified	Not specified	Kellens et al (2009)
Belgium - Walloon				€331 million (Meuse) €1.935 million (Meuse)	1:100 1:100 + 30%	2009	Beckers et al (2013)
Bulgaria	Areas of APSFR in process of being identified						ICPDR (2012)
Croatia	15% of the country at risk of river flooding	87,000 residents at risk from river flooding	57 settlements at risk of river flooding			Not specified	UNDP & WMO (2013); EU & UNDP (2013)
Cyprus	19 APSFRs identified in PFRA				Flash and urban floods are greatest risks; urban most frequent. No risks from fluvial or coastal flooding	2010	Aristeidou (2012)
Czech Republic		75,000 inhabitants in 850 municipalities	26,031 buildings (24,000 residential)		1:20	Not specified	Drbal & Stepankova (2008)
		368,000 inhabitants in 1,499 municipalities	90,381 buildings (88,000 residential and 157,000 flats)		1:100	Not specified	Drbal & Stepankova (2008)

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
		5% of inhabitants live in potential flood risk		5% of value of major types of properties at risk	1:100 (medium probability)	Not specified	ICPDR (2012)
		3.5% of all inhabitants affected (~350,000)			1:100	Not specified	Jirasek & Brezina (2009)
	APSFRR include Kyjovka, Stara Morava, Morava, Dyje, Danlz, Dyje					2011	CEFrame (2011)
				Average per year damages of €20 million per year and 10 lives (1980-1988). Of this 40% to 50% is to agriculture, 15% to 20% damage to river beds and structures and 30% to 65% as local damages in flooded areas (excluding loss of human lives and non-economic damages)			Not specified
Denmark			Vulnerable low-lying areas along the coast contain 60,000 to 70,000 properties			Not specified	Fenger et al (2008)
Estonia		18% of the population (254,000)				2005	Astra Project (nd)

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
		were affected by storm Gudrun					
		10% of the population is at risk from rainfall				Not specified	GHK (2006)
		Half the population of Tallinn (430,000) live within a 2km coastal zone				Not specified	EC (2010)
Finland		76,700 people (1.4% of the population)				2011	Ymparisto (2011)
		50,000 at risk			1:250 coastal/fluvial	2011	Ymparisto (2011)
	21 locations identified as being APSFR					Not specified	Ymparisto (nd)
France		18.5 million people including 1.4 million at risk from coastal flooding	17.1 million permanent residences, with 20% of homes exposed to coastal flooding are single storey	Average cost of damage caused by floods paid by the national solidarity fund is around €400 million per year. Over 9 million jobs are directly exposed to river floods and 850,000 to coastal floods (in total 1 in 3 directly affected)		2011	MEDDE (2011); MEDDE (2012)
Germany	15,060km ² of coastal areas are low-lying	Low-lying coastal region is home to 3.2		Almost 1.2 million jobs are located in	1995 scenario		Sterr (2008)

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
		million inhabitants, concentrated mainly in coastal towns. People at risk in the whole coastal region is 29,800 (population x probability)		the low-lying coastal area at risk of flooding			
Greece		Average no. people affected by flooding per year: 508 to 1,216 (general flood to unspecified event) (1900-2010), with average 2 to 8 deaths		Average damages: €23,500 to €87,000 per event	Range reflects impacts on a general flood versus an unspecified (larger) event	Average over 1900-2010	Bank of Greece (2011)
	122 zones with potentially high flood risk (19% of total area of country)					Not specified	MEECC (2012)
				Compensation for damages caused by floods to farmers was €30.8 million, or around €5 million per year on average		1999-2004	GHK (2006)
Hungary		2,660,000 (26% of population) in 646 settlements 6,300,000 at risk of being affected by floods				Not specified	BOVF (2012); GHK (2006)

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
		(electricity/water shortages, etc.)					
	Excess water potentially could affect about 50% of the territory Almost 25% of territory is at risk of floods from river sections protected by dams Flash floods potentially endanger 10% of the territory					Not specified	ICPDR (2012)
Ireland	300 locations known to be at risk of flooding			Estimated average annual damages per location from current studies range from €250,000 to €2.6 million, with a mean value of €1.1 million. Assuming typical value of €250,000 per site and 300 locations gives national annual average damages of €75 million		Not specified	OPW (2004)
	20% of Ireland's coast is at risk of					Not specified	Policy Research

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
	erosion and 40% of the Wexford coast is vulnerable and needs protection						Corporation (2009)
Italy		3.5 million people (6% of the population) at risk of flooding and mudslides				Not specified	Mysiak (2013)
	Area with highest risk of flooding is 7,774km ² or 2.6% of the national territory					Not specified	Ministero dell'Ambiente (2000)
	The major coastal areas at risk of sea flooding are the Padano-Venetian, Versilia, Fondi and Pontina plains			Value of agricultural land at risk from hydrological flooding: €103 million in Lombardy, Latium and Calabria		Not specified	MELS (2007)
	Estimated that 60% of the country is at risk of flooding					Not specified	SCCV (2007)
Latvia	200,000 ha of flood area or 3% of national territory. This includes agricultural land, residential areas with comparatively large	River Venta: 76,807 residents River Lielupe: 118,906 residents River Daugava: 387,201 residents River Gauja: 33,394				Not specified	Minister for the Environment (2007)

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
	population density and infrastructure, including large hydrotechnic structures	residents					
	Approx. 33% of the coastline is subject to erosion					Not specified	Policy Research Corporation (2009)
Lithuania	There are 54 sections of river where extreme events can occur. For coastal floods, all the Baltic sea area and Curonian Lagoon coastline is identified as having high risk of flooding. The total area at risk covers 28,000 ha of residential areas 4,600km of roads, 193,000 ha of agricultural land and 97,000 ha of forests in tidal at risk areas					Not specified	Minister for the Environment (2012)
Luxembourg							
Malta		16,700 directly affected population	4,520 properties within catchment		Linked to coverage of National Flood Relief	Not specified	Malta Resources

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
			areas covered by NFRP		Project (NFRP)		Authority (2013)
Netherlands		Approx. 9 million people live below sea level				Not specified	Aerts (2009)
		100,000 people live outside areas protected by dikes: Fluvial: Meuse (4,000 people); Rhine (5,000 people) Fluvial: Rhine-Meuse estuary: 60,000 people Dunes of Frisian islands and coastal cities of Holland and Zeeland: 15,000 people Dunes of Frisian islands and coastal cities of Holland and Zeeland: 15,000 people In and around large lakes Marken and IJssel: 5,000 people				2011	Rijkswaterstaat (2012)
		31% of the total urban population and 35% of the total				Not specified	De Moel et al (2011)

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
		population live in flood prone zones (river areas plus coastal zone)					
	60% of territory is prone to flooding					Not specified	WMO & GWP (2011)
				Economic damages estimated at around €135 million per year		2009	Klijn et al (2012)
				70% of the Dutch GNP is earned below sea level		Not specified	Ten Brinke et al (2010)
Poland		Around 1 million people are at risk of flooding (around 3% of the population)				Not specified	National Audit Office (2007)
	5,300km at risk in Vistula basin (protected by embankments)					Not specified	Kundzewicz (2013)
Portugal	Risk areas include coastal areas and floodplains (agricultural or residential areas)					Not specified	GHK (2006)
Romania		1.2 million				Not specified	UNISDR (2008)
	114 flood zones and 600 river sectors identified as APSFR	310,000 households in 2,050 locations are vulnerable to		Potential damages of >€1 million in areas without flood		Not specified	ICPDR (2012)

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
	(without flood defences)	flooding (Danube)		defences			
Slovakia	Significant flood risk areas have been identified in 559 areas near water courses, with total length of 1,286.5 km. Out of the 559 geographic areas, 378 geographic areas have potential of a significant flood risk and in 181 geographic areas, the flood risk is likely to occur					Not specified	Pers. Comm. (Ministry of Environment for the Slovak Republic)
Slovenia	More than 300,000 ha (14.7%) of the total country is at flood risk, with large extensive floods potentially affecting 94,000 ha. This is just 3% to 5% of the total area	132,000 people (7% of the total population) live in regions that suffer from normal levels of flood risk (not defined), while 480,000 people (24%) live in regions where there is a high risk of flooding	More than 2,500 ha of areas at flood risk is in urban areas		Catastrophic flood higher than 1:50	Not specified	GHK (2006)
Spain		Average number of people affected per		Average damages per flood event (1953 to		Not specified	GHK (2006)

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
		flood event (1953 to 2005) of 38,645 of which 316 are made homeless		2005) of US\$400,000			
Sweden			Around 6 million m2 of floor area in buildings is at risk on a 1:100 flood, much of this is low and detached buildings. There are around 120,000 buildings located within 100m of the shoreline	A 1:100 flood across all mapped watercourses would result in total damages to buildings of SEK18.5 billion, or about SEK2.3 million per watercourse km. Value of building areas under the 5m level total SEK 164.1 billion (based on a model from the insurance industry).. Of all flood damage reported by insurance companies, 75-80% concerns flooding from backflow of water via the waste water system		2005	SCCV (2007)
UK- England		4.3 million people live in flood risk areas (8.7% of the population), with	Some 2.1 million properties are in flood risk areas. Of these, around	The Environment Agency estimates that expected annual damage from	1:75 or more frequent	2006	National Audit Office (2007)

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
		900,000 people at significant risk of flooding	469,000 households and businesses are at significant risk of flooding	flooding is £1.1 billion per year			
		64,000 people in the south east are at significant risk of flooding. The south east also has the highest number of people (460,000) at moderate or significant chance of flooding	458,000 of the at-risk properties are in London, although 84% are in areas with a low chance (<1:200) of flooding		1:200 or greater	2007-08	Environment Agency (2009)
			2.4 million homes at risk of river flooding and 2.8 million at risk of surface water flooding (2), with 1 million threatened by both			Not specified	Environment Agency (2009); House of Commons EFRA Committee (2013)
UK- Northern Ireland		16,800 people at risk (all sources) 8,100 (fluvial) 1,800 (coastal) 6,700 (pluvial)	46,000 (fluvial, coastal) 22,000 (pluvial) 5% of all properties	£290.9 million (all sources) £116.8 million (fluvial) £33.4 million (coastal) £140.5 million (pluvial)	1:100 fluvial floodplain 1:200 coastal floodplain	Not specified	Rivers Agency (2011)
UK- Scotland			1:22 residential	£720 to 850 million		Not	SEPA & Natural

A3-1: Current risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Expected annual average damages	Flood event	Data for year	Reference
			properties 1:13 non-residential properties	average annual damages		specified	Scotland (2012)
	243 potentially vulnerable areas have been identified		The potentially vulnerable areas contain 92% of the total number of properties at risk in Scotland	River flooding accounts for approx.. 45% of all predicted impacts Coastal flooding accounts for approx. 17% Surface water flooding account for approx. 28%		Not specified	SEPA (2011)
UK- Wales		357,000 people at risk (1 in 9 of the population) (flooding from rivers and the sea) 97,000 at significant likelihood of flooding 119,000 at moderate likelihood of flooding 141,000 at low likelihood of flooding	220,000 at risk of flooding from rivers or the sea 65,000 at significant likelihood of flooding 73,000 at moderate likelihood of flooding 82,000 at low likelihood of flooding	£200 million (flooding from rivers and the sea)	Significant = >1:75 Moderate = 1:75 to 1:200 Low = <1:200	Not specified	Environment Agency Wales (2011); Environment Agency Wales (2009)

Table A3-2: Future risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Annual average damages	Flood event	Data for year	Reference
Austria							
Belgium-Brussels Capital Region				Blue network established in 1999 to restore rivers and waterbodies, with benefit for flood risk (against background of increasing damages)			LNE (2008)
Belgium - Flanders							
Belgium - Walloon				Estimated damages under 'dry' scenario of €334 to €462 million (increase of 1% to 40%, depending on urbanisation scenario) Estimated damages under 'wet scenario' of €2.124 to €2.408 billion (increase of 540% to 630%, again depending on urbanisation scenario)		2100	Beckers A et al (2013)
Bulgaria	Coastal flooding less severe due to altitude of 70% of the Bulgarian coastal					Not specified	Policy Research Corporation (2009)

Table A3-2: Future risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Annual average damages	Flood event	Data for year	Reference
	zone						
Croatia							
Cyprus							
Czech Republic							
Denmark							
Estonia		5% of the population is projected to be at risk from sea level rise				Not specified	GHK (2006)
		About 3% of the country would be inundated or temporarily damaged, requiring relocation of about 40,000 inhabitants			1m sea level rise	2100	Kont A et al (2008)
Finland							
France				Additional cost of a potential major disaster could raise the economic damage caused by floods to between €1 and €1.4 billion per year		2011	MEDDE (2011); MEDDE (2012)
Germany		Without measures, the population at risk in the low-lying coastal zone is expected to increase to 300,000		Damages without measures are estimated at €3.8 billion per year		2100	Sterr H (2008)

Table A3-2: Future risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Annual average damages	Flood event	Data for year	Reference
		With measures, the population at risk increases to 30,000					
Greece	Area of 82,000 m ³ projected to be inundated with sea level rise of 0.5m and 185,000m ³ on sea level rise of 1m			Damages to housing and tourism estimated at €348 million €631million (undiscounted; at 1% discount rate the PV damages are €142m and €258m and at 3% discount rate are €24 million and €44 million)	0.5m sea level rise 1m sea level rise	2100	Bank of Greece (2011)
Hungary							
Ireland							
Italy				Damage from climate change for Fondi Plan (Latium) and river Sangro plan (Abrezzo) coastal regions of about €14 million		2011	Breil et al (2007) in MELS (2007)
Latvia							
Lithuania							
Luxembourg							
Malta							
Netherlands			Estimated that an additional 500,000 to 1,500,000 new			By 2040	Aerts J (2009)

Table A3-2: Future risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Annual average damages	Flood event	Data for year	Reference
			houses will be constructed				
				Economic damages predicted to increase by 40% to 70% depending upon the economic growth scenario used (from €135 million)		2050	Klijn F et al (2012)
Poland							
Portugal							
Romania							
Slovakia							
Slovenia				No evidence of impact of climate change on frequency of floods, while trends of discharge are slightly declining. Average sea level and frequency of floods is expected to increase		Not specified	IPCDR (2012)
Spain	Area at risk of coastal flooding in Basque Country projected to increase by more than 3 times					2100	Marcos M et al (2012)
	The Ebro and Llobregat Deltas (Catalonia), Manga					Not specified	PNACC (2008)

Table A3-2: Future risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Annual average damages	Flood event	Data for year	Reference
	del Mar Menor (Murcia) and lagoons of Cabo de Gata, Cadiz Gulf and Doñana (Andalucia) are most at risk from a 0.5m sea level rise The Eastern Cantabria region could see 40% of its beaches at risk of flooding with a 0.5m sea level rise						
Sweden			An estimated 152,900 buildings are at risk from erosion with sea level rise of 88cm	An estimated SEK224.4 billion of property and farmland is at risk from erosion (2005 values) with sea level rise of 88cm		2071-2100	SCCV (2007)
UK- England			The number of properties at significant risk of flooding could increase by 350,000 (rivers and seas)			2035	Environment Agency (2009)
				Annual economic damages could increase to between £1 billion and £21 billion		2080s	Environment Agency (2009a); Environment Agency

Table A3-2: Future risk by Member State							
Member State	Area at risk	Number of people at risk	Number of properties at risk	Annual average damages	Flood event	Data for year	Reference
							(2009)
UK- Northern Ireland		8,600 (fluvial) 2,000 (coastal) 9,100 (pluvial)		£341.1 million (all sources) £123.7 million (fluvial) £36.4 million (coastal) £181 million (pluvial)		2030	Rivers Agency (2011)
UK- Scotland							
UK- Wales							

Annex 4: Investments made by Member State

Table A4-1: Investment made (or currently being undertaken)						
Member State	Investment year(s)	Investments made	Investment purpose	Estimated annual investments made		Reference
				Years	Investment	
Austria	2002 2003 2004 2005 2006 2007 2008 2009 2010 2011	€147 million €174 million €139 million €152 million €200 million €185 million €206 million €230 million €206 million €219 million	Overall expenses of the Federal Water Engineering Administration (Bundeswasserbauverwaltung – BWV), Forest Engineering Service on Torrent and Avalanche Control (Wildbach- und Lawinenverbauung – WLV) and the Federal Ministry for Transport, Innovation and Technology (Bundesministerium für Verkehr, Innovation und Technologie – bmvit) for protection against natural disasters	2002-2011	€1,859 million; mean of €186 million per year	Lebensministerium (2012)
	2002	€122 million (€69 million from federal government)	Expenditure on preventative measures against torrential flooding, avalanches and erosion	-	-	SCCV (2007)
Belgium	1998-2015	€419 million	Total expenditure for coastal protection and climate adaptation	-	-	Policy Research Corporation (2009)
	1997; 2005	€30 million	Cost of SIGMA Plan, plus €49 million cost of supporting measures			
	Not specified 2008	€18 million per year €1.3 million	Annual cost of coast maintenance Indirect expenditure to protect against coastal flooding and erosion			
Bulgaria	1998 to 2015	€18 million	Maximum investment made for	-	-	Policy Research

Table A4-1: Investment made (or currently being undertaken)						
Member State	Investment year(s)	Investments made	Investment purpose	Estimated annual investments made		Reference
				Years	Investment	
	2007-2013	None specified	protection against coastal flooding and erosion Operational programme covering environment does not mention projects to protect the coast against flooding, erosion or landslides			Corporation (2009)
Croatia			No data found			
Cyprus			Implementation of Master Plan (mainly focused on erosion) Monitoring of the coast Total investment made for flooding and erosion on the coast	1998-2008 1998-2008 1998-2015	€0.45 million per year €0.35 million per year €15.4 million; mean of €0.85 million per year	Policy Research Corporation (2009)
Czech Republic	Not specified Not specified	€98.6 million (average) €1 million (average)	Costs of preventative measures (considered to probably be an underestimate of actual investment needs) Operating and maintenance costs			GHK (2006)
Denmark	1998-2015 2008	€315 million €13.7 million	Total for coast protection (flooding and erosion) Expenditure on protection against coastal flooding and erosion	2002-2007 2009-2015	€16.8 million per year €18.6 million per year, projected	Policy Research Corporation (2009)
Estonia	2002-2015 2008	€2 million €0.1 million	Total for coast protection (flooding and erosion)	2002-2007 2009-2015	€0.2 million per year €0.1 million per year	Policy Research Corporation (2009)
Finland			Unknown, currently being			

Table A4-1: Investment made (or currently being undertaken)						
Member State	Investment year(s)	Investments made	Investment purpose	Estimated annual investments made		Reference
				Years	Investment	
			evaluated regionally			
France	2004-2008	€500 million	Total spent on 42 programme covering almost 25% of France for flood prevention measures	2004-2008	€100 million per year (mean)	National Audit Office (2007)
	2009	€155 million	Expenditure for prevention of floods			Commissariat Général au Développement Durable (2013)
	1998-2015 2008 2008	€207 million €27.3 million €28.6 million	Total expenditure on coastal protection (flooding and erosion) Coastal protection in mainland France (of which €22.7 million was for Languedoc-Roussillon) Expenditure on protection on natural coastal areas by means of land acquisition and habitat restoration works	1998-2015	€11.5 million per year (mean)	Policy Research Corporation (2009)
	2006-2013	€79 million	Total cost of Flood Prevention Action Programmes (PARIs)	2006-2013	€9.9 million per year (mean)	WMO & GWP (2011)
Germany	1998-2015	€2.3 billion	Total expenditure on coastal protection (flooding and erosion)	1998-2015	€128 million	Policy Research Corporation (2009)
	2008	€134.8 million €1.9 billion	As above			
	2001-2015	€282 million	Coastal defence plans (costs of capital measures only) Schleswig-Holstein, total (€250 million to strengthen primary weirs)			
	2007-2025	€15 million per year €520 million	Schleswig-Holstein, maintenance Lower Saxony			

Table A4-1: Investment made (or currently being undertaken)						
Member State	Investment year(s)	Investments made	Investment purpose	Estimated annual investments made		Reference
				Years	Investment	
	2007-2025 Not specified 1990-2012	€205 million €128 million €2 million per year €600 million €2 million per year	Bremen Mecklenburg-Vorpommern, total Mecklenburg-Vorpommern, maintenance Hamburg, total Hamburg, maintenance			
Greece			No data found			
Hungary	Period of expenditure not stated	€6.2 million €13.1 million per year	Vásárhelyi Plan Other flood control			GHK (2006)
Ireland	2002	€7.5 million	3 projects	2002-2013	€16 million per year (mean)	Anon (nd)
	2003	€3.2 million	3 projects			
	2004	-	-			
	2005	€46.1 million	2 projects			
2006	-	-				
2007	-	-				
2008	€14.3 million	2 projects				
2009	€6.9 million	2 projects				
2010	€32.6 million	2 projects				
2011	€25.9 million	4 projects				
2012	€26.9 million	2 projects				
2013	€28.9 million	4 projects				
	2012-2016	€45 million per year	Continued funding for flood risk management and mitigation, capital programme			Department of Public Expenditure and Reform (2011)
	2011	€8.81 million	Administration			Ireland Stat (nd)
	2012	€8.735 million	As above			
	2011	€0.812 million	Purchase of plant and machinery			
	2012	€0.5 million	As above			

Table A4-1: Investment made (or currently being undertaken)						
Member State	Investment year(s)	Investments made	Investment purpose	Estimated annual investments made		Reference
				Years	Investment	
	2011 2012 2011 2012 2011 2012 2011 2012	€0.925 million €1.04 million €30.9 million €44.5 million €15.8 million €17.8 million €57.2 million €70.6 million	Hydrometric and hydrological investigation and monitoring Flood risk management As above Drainage maintenance As above Total Total			
Italy	1998-2015	€4.6 billion	Total expenditure on coastal protection (flooding and erosion)	1998-2015	€260 million per year (mean)	Policy Research Corporation (2009)
	2008	€380.37 million	As above MOSES project in Venice accounts for more than 90% of total spend at an estimated €3.5 billion			
	Up to 2006	€447.36 million	Urgent preventative measures			MELS (2007)
		€150 million €50 million	Allocation of preventative measures at national level against flash floods Cost of maintenance of existing protection			SCCV (2007)
Latvia	2008-2015	€70 million €48 million €22 million	Programmed for prevention and reduction of flood risks, of which For extreme risks (>1:200 or for specific reasons) For medium probability (>=1:100)			Minister for the Environment (2007)
	2008 1998-2015	€0.06 million €1.4 million	Total expenditure on coastal protection (flooding and erosion)	1998-2015	€0.08 million per year (mean)	Policy Research Corporation (2009)
Lithuania	2003	€0.05 million	Programme for Lithuanian Coastal	1998-2015	€0.6 million per	Policy Research

Table A4-1: Investment made (or currently being undertaken)						
Member State	Investment year(s)	Investments made	Investment purpose	Estimated annual investments made		Reference
				Years	Investment	
	2008 2008-2013 1998-2015 Not specified	€1.64 million €5.8 million €10.45 million €3 million per year (LTL10 million)	Strip Management From EU funds for coastal protection Total expenditure on coastal protection (flooding and erosion) Programme for preparation for floods in Klaipeda Region		year (mean)	Corporation (2009) GHK (2006)
Luxembourg			No data found			
Malta	2006-2008 2009-2010 2010-2013 2000-2007 2008 1998-2015	€0.38 million €2.1 million €71 million €3.33 million €0.5 million €91 million	Preparation of national Storm Water Master Plan project CBA and EIA Infrastructural works (€56 million from EU funds) Smaller flood relief projects As above Total (across all expenditure)	1998-2015	€5.1 million per year (mean)	Policy Research Corporation (2009)
Netherlands	2010	€1,070 million €230 million	Funds from national Government for development of water and spatial planning policy including lake, river and coastal management and maintenance and reconstruction of dams and structures, large navigational waterways and inspection Funds from provinces for spatial planning, water management planning on a regional level and maintenance pf provincial navigational waterways, inspection			Rijkswaterstaat (2012)

Table A4-1: Investment made (or currently being undertaken)						
Member State	Investment year(s)	Investments made	Investment purpose	Estimated annual investments made		Reference
				Years	Investment	
		€2,600 million €1,300 million	and permits for dike reconstruction Funds from Water boards for management of 55,000km of waterways, 18,000km of dikes and 360 sewage treatment plants Funds from municipalities for sewer systems and some local waterways			
	To year 2050 2050-2100	€1.2 billion to €1.6 billion per year €0.9 billion to €1.5 billion per year	Implementation of Delta Programme			WMO & GWP (2011)
	Not specified 2008 2002 2008 2001-2015	€63 million per year €172.5 million per year €22 million €70 million €743 million €300 million €1.8 billion	Annual average coastal maintenance expenditure Annual capital expenditure Annual expenditure on sand nourishment National Flood Defence Construction Programme: strengthening coastal weak links Strengthening other coastal primary weirs that are not up to the required standards Inland flood defence protection			Policy Research Corporation (2009)
Poland			Lack of data on investment into flood risk management specifically			GHK (2006)
	2004	€530 million (PLN2.0 billion)	Funding for water management, which includes flood risk measures	1997-2003	€56 million (PLN200 million)	National Audit Office (2007)*

Table A4-1: Investment made (or currently being undertaken)						
Member State	Investment year(s)	Investments made	Investment purpose	Estimated annual investments made		Reference
				Years	Investment	
	2005 1997-2003	€453 million (PLN1.7 billion) €443 million (PLN1.5 billion) (assumed to be in 2000 values – the mid-year)	Includes cost of repairing flood embankments		per year (mean) (assumed to be in 2007 values)	
Portugal	1999-2000 2000-2010 2002-2015 2003-2015 1998-2009 1999-2009 1998-2009 1998-2009 2005-2015 2008 1998-2015	€16.9 million €19.2 million €12 million €1.1 million €5 million €0.02 million €0.6 million €12 million €16.9 million €11.72 million €131 million	Budgets for the nine Coastal Management Plans: Caminha-Espinho Over-Marinha Grande Alcobaca-Mafra Sintra-Sado Cidadela-SJ Da Barra Sado-Sines Sines-Burgau Burgau-Vilamoura Vilamoura-VRSA Total expenditure on coastal protection (flooding and erosion)	1998-2015	€7.3 million per year (mean)	Policy Research Corporation (2009)
	2000-2006	€13.95 million	Investment planned for river management projects	2000-2006	€2.0 million per year (mean)	GHK (2006)
Romania	2004-2013	€730 million €400 million	Total needed to implement comprehensive overall master plan Amount secured from EU and international donors	2004-2013	€73 million per year (mean)	World Bank (2004)
	2008-2010	€21 million	Funds for 108 objectives of watershed management works			Ministry of Environment and Forests (nd)

Table A4-1: Investment made (or currently being undertaken)						
Member State	Investment year(s)	Investments made	Investment purpose	Estimated annual investments made		Reference
				Years	Investment	
Slovakia	2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013	€1.66 million €0.14 million €3.42 million €2.67 million €6.42 million €0.21 million €2.51 million €1.59 million €27.5 million €12.6 million €0.46 million €4.62 million	Flood security measures	2002-2013	€5.3 million	Pers. Comm. (Ministry of Environment for the Slovak Republic)
	1999-2015	€172 million	113 projects for flood protection measures in Slovak Republic	1999-2015	€44 million (mean, based on spend being evenly divided across years of projects)	Anon (nd)
Slovenia	2007-2013	€14 million	Estimated investment based on statistics and percentages of types of natural disasters for floods only (projected)			GHK (2006)
	2007-2013 2008	€1.6 million €3 million	Coastal area management Budgeted for protection against coastal flooding and erosion	1998-2015	€1.2 million per year (mean)	Policy Research Corporation (2009)
	1998-2015	€21 million	Total expenditure on coastal protection (flooding and erosion)			
	2007-2013	€20 million	Secolvje saltpan hotspot against flooding due to sea level rise			

Table A4-1: Investment made (or currently being undertaken)						
Member State	Investment year(s)	Investments made	Investment purpose	Estimated annual investments made		Reference
				Years	Investment	
Spain	1998-2015	€935 million	Total expenditure on coastal protection (flooding and erosion)	1998-2015	€52 million per year (mean)	Policy Research Corporation (2009)
	2008	€62.71 million	Coastal flooding and erosion protection			
Sweden	1980s to 2005	SEK25 million per year (€1.68 million per year)	Annual budget for assisting municipalities with preventative measures against natural disasters	1998-2015	€7.1 million per year (mean)	SCCV (2007)
	2007 to 2009	SEK40 million per year (€2.68 million per year)	Temporary increase to appropriation by Government			
	2008 1998-2015 2006-ongoing	€9.5 million €127 million €0.55 million per year	Total expenditure on coastal protection (flooding and erosion) Investment in Ystad for ad hoc measures			
UK- England	2011-2015	€2.7 billion €175 million	Total for flooding and erosion Expected from private and council funding	1998-2015	€7.1 million per year (mean)	HM Government (2013); House of Commons Environment Food and Rural Affairs Committee (2013)*
		€141 million	Additional funding announced 2012 (capital projects)			
	2012-2013	€328 million	Capital funding			
	2012-2013	€363 million	Revenue funding			
	2010-2011	€117 million	Environment Agency's regional revenue maintenance budget			
	2014-2015	£60.7 million ⁺	Asset management spend			
2012-2013	€85 million	As above				
2013-2014	£146 million ⁺	As above				
2014-2015	£136 million ⁺	As above				
UK- Northern Ireland	2011/12	€0.3 million	Floods Directive implementation	2011-2015	€4.7 million	DARD (2011)*

Table A4-1: Investment made (or currently being undertaken)						
Member State	Investment year(s)	Investments made	Investment purpose	Estimated annual investments made		Reference
				Years	Investment	
	2012/13 2013/14 2014/15 2011/12 2012/13 2013/14 2014/15	€0.5million €0.6 million ⁺ £0.4 million ⁺ €4.7 million €4.6 million €5.9 million £3.4 million ⁺	Flood defence capital works and drainage infrastructure	(capital investment only)	(mean)	
UK- Scotland	2002/03 2003/04 2004/05 2005/06 2006/07 2007/08 2002/03 2003/04 2004/05 2005/06 2006/07 2007/08	€8.1 million €8.1 million €11.5 million €6.9 million €13 million €47 million €17 million €5.8 million €2.0 million - €99 million €131 million	Government grants paid out for flood risk management (50% to 2004 and 80% thereafter). Expenditure made by Local Authorities Total value of flood protection schemes (i.e. total cost of new flood prevention schemes when approved by the Minister and when work started)	2002 to 2008 (based on total value of flood prevention schemes)	€42.5 million (mean)	Scottish Parliament (2010)*
UK- Wales	2009-2010	€36 million	Maintenance			Environment Agency Wales (2010)*
Assumptions and caveats: * exchange rate used for the year of the cost, unless otherwise specified. Reference Eurostat (nd) + exchange rate not known						

Annex 5: List of SME resource efficiency support programmes identified and reviewed

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs																		
Initiative	MS	Level of support		Sub-category														
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support
'Klima- und Energiefonds' (KLIEN)	AT	x										x						
'Umweltförderung im Inland'	AT	x										x						
Ecobusiness	AT		x				x									x	x	
Energieförderkompass [energy-promotion/funding-compass]	AT		x				x											
Exportinitiative Umwelttechnologien	AT	x								x								
Ökobusinessplan Wien	AT	x	x				x							x		x	x	
Ökologische Betriebsberatung [ecological company support]	AT		x													x	x	
Ökomanagement	AT		x				x									x	x	
ÖKOPROFIT	AT		x				x							x		x		
The telephone service from the Umwelt Service Salzburg	AT		x															
Umwelt Service Salzburg	AT		x				x									x	x	

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category																
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S	
Waiver of administration fees	AT	x		x																
Zukunft Innovation [future innovation]	AT		x				x				x							x		
4th Environmental Policy Plan (MINA-4) [Milieubeleidsplan 2011-2015]	BE		x				x												x	
Eco-Efficiëntiescan	BE		x				x											x	x	
Ecotoolkit	BE	x						x	x											
Energy Scan (energy audit)	BE	x					x													
FIRD	BE	x										x								
GOM-Milieucellen	BE	x	x																	
Flemish Energy Agency	BE	x	x				x		x		x							x		
Marshall Plan 2.Green	BE		x	x			x					x	x		x			x		
Material Scan (material audit)	BE	x					x													
Network of 'facilitators'	BE	x	x															x		
SME Portfolio [KMO portfolio]	BE	x										x								
Subsidy Database	BE	x					x													
Sustainable Innovation System (SIS) Toolkit	BE	x						x												

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category																
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S	
SYMBIOSIS	BE	x															x			
TETRA	BE		x				x				x						x			
The Energy Fund	BE	x									x									
The Environment Consultants UWE	BE		x			x	x			x							x		x	
The Green Technologies Business Unit	BE	x					x				x									
Winwinlening [Win win loan]	BE		x	x							x									
Ecotoolkit	BG	x						x	x											
National Strategy for SME's development (2007-2013)	BG	x									x									
Training programme on environmental management	CY	x										x								
Eco-energy	CZ	x									x									
Operational Programme Environment	CZ	x									x									
South Bohemia Regional Programme	CZ		x															x	x	
The Czech Environment Management Centre	CZ	x					x				x		x							
EKO-INFO	CZ	x	x																	

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category															
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S
The Programme of Support for Small and Medium-sized Enterprises	CZ	x										x							
The State Program of Environmental Training and Education	CZ	x											x						
Ressourceneffiziente Technologien Baden-Württemberg – ReTech-BW	DE		x				x					x							
Bavarian Environmental Agreement	DE		x															x	x
Bavarian Environmental Consulting and Audit Programme [Bayerisches Umweltberatungs- und Auditprogramm (BUBAP)]	DE		x				x										x	x	x
Climate Change Partnership	DE	x													x				
Consultancy Assistance Programme	DE		x															x	
Demea, German material efficiency agency (Deutsche Materialeffizienzagentur)	DE	x					x			x									

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category															
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S
Ecofit	DE		x			x	x				x			x			x		
Eco Step	DE	x	x		x	x		x				x	x	x			x		x
Efficiency Agency NRW (EFA)	DE		x			x	x	x	x		x						x	x	
EffNet	DE	x					x	x	x	x			x						
Energy efficiency consultation [Energieberatung]	DE		x			x	x										x	x	
EMAS EASY Network	DE		x									x					x		x
Energy efficiency in industry and commerce [Energieeffizienz in Industrie und Gewerbe]	DE		x				x										x	x	
Energy transition [Energiewende]	DE	x	x				x						x	x				x	
Golnno with two subprograms or modules: go-effizient and go-innovativ (go-effizient is the module focusing on resource efficiency)	DE	x	x				x	x									x	x	
Hessen Modell Projekte	DE		x				x				x	x						x	
Information Portal Resource Efficiency [Informationsportal Ressourceneffizienz]	DE		x				x	x			x								

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category																
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S	
Innovation vouchers	DE	x									x									
Energy-efficiency-program [KfW-Energieeffizienzprogramm]	DE	x									x									
KMU-Innovativ [KMU = SME]	DE	x					x				x									
Material Efficiency in Production	DE		x															x		
NeRes, Network Resource Efficiency [Netzwerk Ressourceneffizienz]	DE	x					x						x	x						
Okoprofit	DE	x	x									x	x	x		x			x	
ProgRes, National Resource Efficiency Programme [Nationales Ressourceneffizienzprogramm]	DE	x					x													
QuB	DE	x																	x	
RKW	DE	x	x				x					x				x				
The Central Association of the German Trade Association (ZdH)	DE	x					x							x					x	
UGA, German EMAS Advisory	DE	x					x						x	x					x	

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category																
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S	
Board [Umwelt Gutachter Ausschuss]																				
UIP, Environmental Innovation Programme [Umweltinnovationsprogramm]	DE	x					x				x	x								
Environment Pact Bavaria [Umweltpakt Bayern]	DE		x				x				x	x			x				x	
Environmental Partnership Brandenburg [Umweltpartnerschaft Brandenburg]	DE		x				x							x					x	
Eco-cert	DE		x				x	x									x		x	
Environmental Seal Brandenburg [Umweltsiegel Brandenburg]	DE		x		x	x			x							x			x	
Companies for the Protection of Resources [Unternehmen für Ressourcenschutz]	DE		x				x				x	x				x	x			
VDI-ZRE	DE	x					x		x				x							
VerMAT	DE		x													x				
ZIM	DE		x											x				x		

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category															
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S
Green Business Growth [Grøn Erhvervsvækst]	DK		x									x	x	x					
Danish Energy Agency	DK	x					x	x											
Danish Growth Capital [Dansk Vækstkapital]	DK	x									x								
Green 21	DK	x					x	x		x									
Green Network	DK		x											x					x
Green Transition Fund [Grøn Omstillingsfond]	DK	x									x								
Key2Green	DK		x				x	x	x										
Market Development Fund [Markedsmodningsfonden]	DK	x									x								
Netmatch	DK	x								x				x					
Start Growth [Startvækst] Regional Business Development Centres (Væksthusene)	DK	x	x										x	x		x			
Strengthening Innovation in Firms [Styrket Innovation i Virksomhederne]	DK	x												x					
Subsidy for eco-efficient technology [Tilskudsordning til	DK	x									x								

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category																
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S	
miljøeffektiv teknologi]																				
The Growth Wheel for Green Business [VækstHjulet]	DK	x					x				x						x			
Ecotoolkit	EE	x						x	x											
EMAS Easy MOVE-IT	EE	x					x		x		x	x	x						x	
KredEx	EE	x									x									
CECO2PYME	ES	x	x							x			x				x			
CEPYME Aragón (Web Ambiental)	ES	x					x			x										
Club EMAS	ES	x											x						x	
Compromiso Zaragoza PYME Ambiental	ES		x				x		x	x										
ECODES (website)	ES	x					x													
EkoScan	ES	x										x	x						x	
Enerline	ES	x	x																	
Gipuzkoa Plan de Energía 2012-2015 (Industrial SMEs)	ES	x	x				x						x							
IHOBE Corporation	ES		x				x	x		x							x	x	x	
Programa Ecoeficiencia en la empresa Vasca (2010-2014)	ES	x	x					x					x				x			

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category																
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A/S)	
Impulsando PYMEs	ES	x					x										x			
Lineambiental.es website	ES	x					x													
PINE Project (Promoting Industrial Energy Efficiency)	ES					x														
Plan de uso sostenible de la energía y prevención del cambio climático de la ciudad de Madrid 2008-2012	ES	x				x														
Portal PYME (Ministerio de Industria, Energía y Turismo (Secretaría General de Industria y De La Pequeña y Mediana Empresa))	ES	x					x													
Programa e+5	ES	x			x														x	
Proyecto Asoclym	ES	x	x						x							x				
Proyecto CHANGE	ES	x	x			x	x						x	x					x	
Proyecto de Sensibilización y Fomento del Ahorra y la Eficiencia Energética	ES	x	x				x		x											
Proyecto Enerpyme (Programa para la optimización del uso de	ES	x						x	x											

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category																
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S	
la energía en la PYME)																				
PYMEverde	ES	x					x		x			x								
SUSTEEN Project	ES	x	x			x		x					x				x			
The Environment Foundation	ES	x					x	x				x		x						
Ecofood/Ecofood-SME	ES	x						x					x							
Proyecto ENECO	ES	x											x	x						
Environmental guarantee	FI	x									x									
Material Efficiency Centre	FI	x					x	x	x											
Sitra' Environment Programme 2005-2007	FI	x												x						
Advice during inspection visits	FI		x			x										x				
1.2.3 Environment	FR	x						x		x									x	
Eco-emballages	FR	x				x	x		x			x								
Eco Step	FR	x	x		x	x		x				x	x	x		x			x	
Enhanced green loan	FR	x									x									
Environment and Energy Guide	FR	x						x												
Environmental Technologies Fund	FR	x									x									
EnVol	FR	x	x				x												x	

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category																
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S	
FOGIME fund	FR	x										x								
Innovation vouchers	FR	x										x								
L'ADEME (en Ile-de-France)	FR	x					x					x								
PBE+ (Performance Bretagne Environnement Plus)	FR		x				x	x					x							
Plan PME	FR		x						x				x							
Ready eco-energy	FR	x																		
ACCES Rhône-Alpes/ISO 14001	FR		x											x				x		
Support Project Environment	FR		x							x								x	x	
Environmental Protection and Energy Efficiency Fund (EPEEF)	HR	x										x								
Egy Mozdulat	HU	x						x												
Green Days	HU	x						x												
Business Process Improvement – GreenPlus assignments	IE	x											x							
Cleaner Greener Production Programme	IE	x											x							
Ecocert	IE	x	x		x	x		x		x								x		
Envirocentre.ie website	IE	X						X												

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category																
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S	
Environmental and Clean Energy Innovation Fund	IE	x									x									
Green Business Initiative	IE	x	x			x		x		x			x					x		
Green Hospitality Programme	IE	x				x		x	x			x	x							
Green Plus	IE	x	x			x					x	x							x	
Green Plus Assignments	IE	x									x									
Green Start	IE	x	x			x	x					x						x	x	
Green Transform	IE	x									x									
GreenTech Support	IE	x									x									
SMILE ('Saving Money through Industrial Linkages and Exchanges')	IE	x	x										x		x	x				
Technical Feasibility Grants	IE	x									x									
SME Programme	IE	x	x			x		x	x		x	x	x					x		
Green Seafood Business	IE	x	x			x	x	x			x		x	x				x		
The Business to Business (B2B) Green Mentors Programme	IE		x										x	x	x					
Eco Step	IT	x	x		x	x		x				x	x	x				x	x	
EIB and the Intesa Sanpaolo Group	IT	x									x									

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category																
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S	
Giada Project	IT		x				x					x	x						x	
Innovhub Milano	IT	x					x						x							
TREND (Tecnologia e innovazione per il Risparmio e l'efficienza ENergetica Diffusa)	IT		x			x														
BSR Stars Programme (Baltic Sea Region)	LT	x	x				x				x					x				
3rd Action Plan for SMEs (government)	LU	x										x		x	x					
High Value Added Investments 3rd call	LV	x									x	x	x		x					
Business Advisor Service	MT	x										x								
Invest in your future	MT	x					x				x				x					
Malta Enterprise	MT	x										x								
123 Subsidie NL	NL		x							x		x						x		
Duurzaam MKB [sustainable SME]	NL	x					x	x	x		x									
Energie Centrum	NL	x	x			x	x		x		x						x	x		
Energy Investment Allowance	NL	x		x																
MIA and Vamil	NL	x		x			x				x									

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

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		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S	
Green Deal	NL	x					x			x	x									
Green Funds Scheme	NL	x		x																
Industrial Environmental Agencies (BMD)	NL		x																x	
Innovatiefonds MKB+ [Innovation funds SME]	NL	x										x								
Knowledge Networks	NL	x												x						
Milieubarometer [environment-barometer]	NL	x	x						x											
SCCM	NL	x	x				x												x	
Stimular	NL		x			x		x	x											
Syntens	NL		x				x		x		x		x				x			
The Random Depreciation of Environmental Investments (VAMIL)	NL	x		x																
Clean Business Programme	PL	x	x				x		x					x						
KSU	PL	x	x										x					x		
SPIN	PL	x	x				x		x				x	x	x			x		
The Implementation Project	PL	x	x					x					x					x	x	

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category																
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S	
ECO-SME+	PT	x							x			x							x	
The National Association for Young Entrepreneurs	PT	x	x				x	x		x								x		
Environment-driven business development	SE		x			x	x													
Forska & Våx (Research & Grow)	SE	x									x									
Hackefors model	SE	x	x											x			x		x	
The Environment Diploma	SE	x			x							x							x	
The Production Leap	SE	x	x				x				x	x						x		
VINN NU	SE	x																		
Ecotoolkit	SI	x						x	x											
Recycling Fund	SK	x										x								
Tax exemptions	SK	x		x																
The Environment Fund	SK	x										x								
The National Agency for Development of Small and Medium Enterprises	SK	x					x						x	x	x			x		
Energy Saving Trust	UK	x					x		x			x								
Bright Green Business	UK	x	x				x			x			x		x				x	

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

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Business Environment Coordinators	UK	x	x			x				x		x		x					x	
Business Support (one includes Small Business Bonus Scheme)	UK		x									x						x		
Carbon Trust	UK	x				x	x		x	x	x									
Energy Entrepreneurs Fund	UK	x							x		x									
Environmental Sustainability Knowledge Transfer Network	UK	x											x	x						
Envirowise	UK	x	x			x	x	x					x							
ENWORKS	UK		x			x	x						x	x						
Green Business Network	UK	x	x				x						x	x						
'Green Tick' EMS	UK	x																	x	
LEP Network (Local Enterprise Partnerships)	UK		x				x	x					x							
London Re-use Network	UK		x				x													
Low Carbon Funding website	UK	x					x					x								
NetRegs	UK	x					x													
NISP	UK	x	x				x		x	x		x	x	x						
Resource Efficiency East	UK		x			x				x			x						x	

Table A5-1: Programmes identified providing resource efficiency assistance to SMEs

Initiative	MS	Level of support		Sub-category																
		National level help-desks and information provision	Hands-on, direct, local/regional level support mechanisms	Tax break	Certification scheme	Audits	Online information repository	Self-help tools and guides	Web-based audit/Self-assessment tools	Remote support	Provision of detailed case studies	Grants	Training	Workshops/events	Networks	Study tours	Face-to-face consulting	Grants and consulting support	Assistance to set up EM(A)S	
The Green Deal	UK	x									x									
WRAP	UK	x					x	x		x	x	x	x	x						
Zero Waste Scotland	UK	x					x	x	x				x	x						
EKOMARK	Various	x																		
Green for Growth Fund (Southeast Europe)	Various	x				x														
NeGOSE (Network for Green Office Standardisation)	Various	x						x	x				x							
The Environmental Compliance Assistance Programme (ECAP)	Various	x					x		x		x			x						
E-Check in Craft SME	5 MS	x				x							x							

Additional resource efficiency support programmes

The programmes listed below have been highlighted by Member States after submission of the Draft Final Report. As agreed between the consultants and DG Environment, these programmes are included here for completeness but it is noted that they have not been studied nor included in any of the analysis presented in the report.

Table A5-2: Additional programmes supporting SMEs to improve resource efficiency		
Member State	Resource efficiency support programme	Details
Belgium	Eco-Dynamic Label	The “Eco dynamic company” label is an official recognition of good environmental management practices of public and private Brussels companies. It rewards their environmental dynamism and their progress in waste management, energy consumption and the rational use of raw materials. It also encourages the introduction of an environmental management system, with a view to the Eco-Management and Audit Scheme (EMAS) or ISO 14001. The label is a 3-stars label, depending on the level of environmental performance. The target groups are large or small, private, public or mixed, branch of a multinational, SMEs, administration or association in the Brussels Capital Region. <u>Results:</u> 177 organisations (employing 40,000 FTE employees) have been awarded the “Entreprise Ecodynamique” label. http://www.bruxellesenvironnement.be/Templates/Professionnels/niveau2.aspx?maintaxid=11771&taxid=11771
	Materialenscan	Carried out in 2013-2014 in 225 SMEs – cost: around 1 million euros
	Ecolizer	-
	SIS toolkit	-
	Symbioseplatform (Flanders sustainable resource matchmaking valorization platform)	Pilot-phase launched in 2012-2014 The SYMBIOSE platform is already a form of cooperation between producers themselves, with the aim of utilising waste (or recycled waste) from one company as a raw material in another
Hungary	“Money Back Through the Window”	The KÖVET Association for Sustainable Economies annually publishes case studies of companies making cost and environmental savings from resource efficiency measures. An annual award ceremony recognises achievements. Provides an online repository, detailed case study examples and grants.
	National Industrial Symbiosis Programme	The National Industrial Symbiosis Programme, completed in 2012, was funded by the EU through its LIFE+ Programme and delivered free to businesses. In 3 years, 1,200 tonnes of waste were diverted from landfill, 1,238 tonnes of raw materials were saved and 26,000m ³ of water saved. Services included provision of detailed case studies, training, workshops/events, networks and study tours.

Annex 6: Direct, hands-on resource efficiency programmes

A. National Industrial Symbiosis Programme, United Kingdom

A.1 Objectives

The National Industrial Symbiosis Programme (NISP) is a free advice and networking programme for businesses of varying size and sector. The programme's primary aim is to encourage sustainable resource management by facilitating the exchange of materials between companies. Typically this involves one company taking a process by-product from another company and using it in its own processes⁶⁵.

A.2 Programme structure and approach

Programme structure

NISP is a project from International Synergies Ltd and SRS and was first piloted in three regions of the UK in 2003. Given its success, the project was extended to the rest of the UK, see Table A1.1.

Region	Date started	Focus
West Midlands	September 2003	One of the most mature NISP regions
East Midlands	April 2005	Works with Christian Salvesen, Lafarge Cements
London	September 2005	Economic diversity, city's 33 boroughs
South West	April 2005	Largest NISP region, wide range of industries
South East	April 2005	Works with ABP, Earthlie, Vitacress Salads, Lafarge
Yorkshire and Humber	September 2005	Works with Anglian Water and ConocoPhillips
North East	April 2005	Job creation and waste from landfill diversion
North West	April 2005	Works with food, drink, & automotive companies
East of England	October 2005	Works across multiple counties
Scotland	April 2003	Works with Scotia Gas and Wiseman Dairies
Wales	April 2006	Launched by International Synergies
Northern Ireland	February 2007	Economic, environmental, and social advantages

Whilst the scheme exists on a national scale, it operates at a regional level, with 12 offices across England, Scotland, Ireland and Wales. Within each regional team the dedicated

⁶⁵ COWI (2011): Economic Analysis of Resource Efficiency Policies – Final Report for DG Environment, accessed at http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/economic_analysis.pdf

⁶⁶ Sell, B. *et al.* (2009): Foundations for Sustainable Local Economic Development Planning – Waste-to-Profit Networks as a Sustainable Local Economic Development Strategy, accessed at http://pled.gatech.edu/pages/PLED_Report/2009/Waste-to-Profit%20%20Final%20SLED%20Paper.pdf

Industrial Symbiosis Practitioners work closely with their members⁶⁷. Activities are agreed with an independent board, which comprises staff from Defra, the Regulator and DTI.

Services provided

The services are only available to members, with the fees dependant on the number of employees within the business. For SMEs, the annual fee is £275 plus VAT for businesses with up to 10 employees and £585 plus VAT for businesses with 11-250 employees. The subscription level determines the number of resources available to the company, see Table A1.2.

Services	Up to 10 employees	11 to 250 employees
Workshop package*	1	2
User account	1	1
Resources**	3	4
*Includes attendance and a bespoke report detailing resource matches identified at the workshop		
**Members can upload up to the allocated number of their resources into the system		

The programme is focused on avoiding waste by encouraging reuse. There are a number of services for members; some are accessed via the website, such as case studies and the on-line business directory, whilst others involve more hands-on support from the Industrial Symbiosis Practitioners and workshop packages.

Duration of support

The duration of support to businesses is variable, depending on their circumstances and to some degree the level of membership, with larger companies able to attend more workshops and upload more resources. Members of a regional network can choose to make a single exchange with another company or several.

Monitoring & evaluation

A.3 Results

Service uptake

Since 2005, the NISP network's membership has increased steadily. In 2008, there were more than 8,000 members⁶⁸, increasing to 13,400 in May 2010⁶⁹. The latest figures show

⁶⁷ Technopolis Group (2008): Eco-innovation – Final Report for Sectoral Innovation Watch, accessed at http://www.technopolis-group.com/resources/downloads/661_report_final.pdf

⁶⁸ Technopolis Group (2008): Eco-innovation – Final Report for Sectoral Innovation Watch, accessed at http://www.technopolis-group.com/resources/downloads/661_report_final.pdf

⁶⁹ COWI (2011): Economic Analysis if Resource Efficiency Policies – Final Report, report for DG Environment, accessed at http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/economic_analysis.pdf

membership has reached more than 15,000 industry members⁷⁰. In 2010, it was estimated that around 95% of members were classified as SMEs⁷¹.

Economic, social and environmental impacts

NISP was extended to all regions of the UK in 2005, the outputs (according to BREW measures) for the first year of national operation are provided in Table A1.3.

BREW measures	Reported outputs	Adjusting for attribution	Adjusting for persistence	Output per £1M invested
Material diverted from landfill (tonnes)	636,852	393,670	1,360,395	388,684
Hazardous waste eliminated (tonnes)	221,625	110,813	289,531	82,723
Virgin materials saved (tonnes)	950,137	598,957	2,129,306	608,373
CO ₂ saved (tonnes)	328,964	279,118	1,198,264	342,418
Water saved (tonnes)	264,475	132,238	330,594	94,455
Additional sales for business (£)	16,510,335	14,164,648	64,958,819	18,559,662
Cost savings to business (£)	36,449,707	31,585,723	145,768,655	41,648,185

Outputs for the first five years of operation, from April 2005 to March 2010, are shown in Table A1.4 below. Estimates of the programme's outcomes have also been provided for persistence for five years under two scenarios.

⁷⁰ International Synergies website: National Industrial Symbiosis Programme (NISP Network), accessed at <http://www.international-synergies.com/projects/national-industrial-symbiosis-programme-nisp>

⁷¹ Laybourn, P. (2010): Environmental Good and Services and Green Business Models (Presentation), accessed at http://ec.europa.eu/enterprise/policies/sustainable-business/sustainable-industry/forums/pastforums/files/6_is_nisp_laybourn_en.pdf

⁷² Agarwal, A. & Strachan, P.: The UK National Industrial Symbiosis Programme – Towards Developing a New and Integrative Methodology to Evaluate Industrial Symbiosis Networks, accessed at <http://www2.rgu.ac.uk/abs/National%20Industrial%20Symbiosis/Presentation.pdf>

Table A1.4: Outputs for NISP activities from April 2005 to March 2010 (externally verified) ⁷³			
Indicator	Actual	Scenario 1*	Scenario 2**
Economic			
Cost savings to business	£156,082,258	£468,246,774	£780,411,290
Additional sales for business	£176,097,919	£528,293,757	£880,489,595
Environmental			
Landfill diversion (Tonnes)	7,022,384	21,067,152	35,111,920
CO ₂ reduction (Tonnes)	6,038,059	18,114,177	30,190,295
Virgin material savings (Tonnes)	9,704,711	29,114,133	48,523,555
Hazardous waste eliminated (Tonnes)	363,626	1,090,878	1,818,130
Water savings (Tonnes)	9,569,738	28,709,214	47,848,690
Social			
Jobs created	3,683	13,309	22,181
Jobs saved	5,087	18,379	30,632
* Scenario 1 – Persistence effect with 20% decay per annum			
** Scenario 2 – Persistence effect with 0% decay per annum			

Accumulative outputs for the programme, from April 2005 to March 2013, have been reported by International Synergies and are shown in Table A1.5.

Table A1.5: Outcomes for NISP from April 2005 to March 2013 ⁷⁴	
Indicator	Actual
Economic	
Cost savings to business	£1,000,000,000
Additional sales for business	£1,000,000,000
Environmental	
Landfill diversion (Tonnes)	47,000,000
CO ₂ reduction (Tonnes)	42,000,000
Virgin material savings (Tonnes)	60,000,000
Hazardous waste eliminated (Tonnes)	1,800,000
Industrial waste (Tonnes)	73,000,000
Social	
Jobs created	10,000
Jobs saved	

In 2013, the Ellen MacArthur Foundation reported that since its launch in 2000, NISP has resulted in cost savings of £1 billion, additional sales revenue of £993 million and the creation of over 10,000 jobs in the UK economy⁷⁵. A report published in September 2013 reported that NISP programme has boosted the UK economy by up to €3 billion⁷⁶.

⁷³ NISP (2009): The Pathway to a Low Carbon sustainable Economy, accessed at http://www2.wrap.org.uk/downloads/Pathway_Report.6b5d34b1.8900.pdf

⁷⁴ International Synergies website: National Industrial Symbiosis Programme (NISP Network), accessed at <http://www.international-synergies.com/projects/national-industrial-symbiosis-programme-nisp>

⁷⁵ Ellen MacArthur Foundation (2013): Towards the Circular Economy – Opportunities for the consumer goods sector (Volume 2), accessed at <http://www.ellenmacarthurfoundation.org/business/reports/ce2013>

⁷⁶ RE-SEETies (2013): Deliverable Report on D.4.2: Step-by-step methodology with initial criteria for assessment (WP4), accessed at http://www.re-seeties.eu/sites/default/files/act4-2_report_final_0.pdf

Despite a drop in funding towards the end of the first five years of operation, the programme generated significant positive impacts and achieved an increasing degree of value for money. For example the cost per tonne of landfill diversion was £0.58 in year 1 compared to £0.15 in year 5⁷⁷.

An Economic Impact Assessment for 2005-10⁷⁸ calculated the Total Economic Value Added to be in the region of €2.058m to €3.430m, giving an investment multiplier of 53.2 to 88.6 and generating €207m to €346m to Treasury in direct receipts. The benefit cost ratio (BCR) was in the range of 32:1 to 53:1, to put this into context, a BCR of 3:1 was considered good by a previous UK Government and 8:1 is deemed excellent by Regional Development Agencies.

More specific returns on investment are provided in Table A1.6 below.

Benefit realised	NISP Input Required
€2 new income generated for industry	3 cents
€2 saved by UK industry	3 cents
1 tonne of virgin material saved	57 cents
1 tonne of water saved	48 cents
1 tonne of CO ₂ reduced	87 cents
1 tonne of waste diverted from landfill	87 cents
1 tonne of hazardous waste eliminated	13 cents

A.4 Costs

Expenditure

Unfortunately, no information has been identified concerning the annual expenditure of NISP.

Sources of funding

NISP is largely funded by Defra (see Table A1.7), the Scottish Government, Welsh Assembly Government, Invest Northern Ireland and regional development agencies. In 2010, NISP was subsumed into the WRAP programme, along with other organisations concerned with resource efficiency.

⁷⁷ NISP (2009): The Pathway to a Low Carbon sustainable Economy, accessed at http://www2.wrap.org.uk/downloads/Pathway_Report.6b5d34b1.8900.pdf

⁷⁸ Laybourn, P. (2010): Environmental Good and Services and Green Business Models (Presentation), accessed at http://ec.europa.eu/enterprise/policies/sustainable-business/sustainable-industry/forums/pastforums/files/6_is_nsip_laybourn_en.pdf

⁷⁹ Laybourn, P. (2010): Environmental Good and Services and Green Business Models (Presentation), accessed at http://ec.europa.eu/enterprise/policies/sustainable-business/sustainable-industry/forums/pastforums/files/6_is_nsip_laybourn_en.pdf

Table A1.7: Funding received from Defra from 2005/06 to 2009/10 (figures rounded to nearest million)⁸⁰

Year	Funding from Defra (£ million)
2005/06	3
2006/07	6
2007/08	10
2008/09	5
2009/10	5

Funding from Defra has also been confirmed as £18.2 million from 2005/06 to 2007/08 by a report produced by the National Audit Office in 2010⁸¹. In 2005, NISP was awarded £27 million in funding from Defra to cover a period of three years to implement the programme in all nine regions in England⁸².

NISP received £300,000 in 2008/09 and 2009/10 from the Sustainable Action Fund 2008-11⁸³.

A.5 Best practice examples

The NISP programme has been recognised as best practice on many levels, including accreditation by the European Commission as an Exemplar of Eco-Innovation through its Environmental Technologies Action Plan (ETAP, 2007) and has won Best Carbon Reduction Project at edie.net Environmental Excellence Awards 2010⁸⁴.

Whilst NISP is a national programme, it gains benefits from also operating at a regional level. Within each regional office, there are Industrial Symbiosis Practitioners, who are on hand to assess the circumstances of businesses and facilitate exchanges.

From 2010 onwards, NISP has operated under the Waste and Resources Action Programme (WRAP), along with other resource efficiency programmes, including Envirowise. Acting as a one-stop-shop, WRAP can ensure businesses receive the most from the support programmes available to them.

Case studies and best practice examples can be accessed through the NISP network and members only websites. The sharing of information is also possible in the regional workshops and networking events.

⁸⁰ They Work for You website: Departmental Public Expenditure – Energy and Climate Change, accessed at <http://www.theyworkforyou.com/wrans/?id=2009-03-10b.257667.h>

⁸¹ National Audit Office (2010): Reducing the impact of business waste through the Business Resource Efficiency and Waste Programme, accessed at <http://www.nao.org.uk/wp-content/uploads/2010/03/0910216.pdf>

⁸² International Synergies website: National Industrial Symbiosis Programme (ISP Network), accessed at <http://www.international-synergies.com/projects/national-industrial-symbiosis-programme-nisp>

⁸³ Scottish Government website: Sustainable Action Fund 2008-11 expenditure, accessed at <http://www.scotland.gov.uk/Resource/Doc/933/0114224.pdf>

⁸⁴ International Synergies website: National Industrial Symbiosis Programme (NISP Network), accessed at <http://www.international-synergies.com/projects/national-industrial-symbiosis-programme-nisp>

Where the exchange of materials is ongoing, businesses are likely to gain lasting benefits through avoided disposal and/or raw material costs.

Annual membership to the network allows businesses to receive long-term support. The membership itself is a small cost that is likely to be outweighed by the financial and environmental benefits of exchanges.

A.6 Potential gGains

No information identified.

B. Envirowise, United Kingdom

B.1 Objectives

Set up in 1994, the Envirowise programme aimed to increase resource efficiency in UK businesses with the result of reducing their environmental impact and producing cost savings.

In April 2010, several government organisations focusing on resource efficiency were subsumed into the Waste and Resources Action Programme (WRAP) to provide a one-stop-shop⁸⁵. These included Envirowise, the National Industrial Symbiosis Programme (NISP), Action for Sustainability and the Business Resource Efficiency and Waste (BREW) programme.

Within this section, elements of WRAP will also be discussed as it now carries out Envirowise's activities.

B.2 Programme structure and approach

Programme structure

Envirowise

Envirowise was a government funded programme and run by Serco TTI and AEA Technology. The programme is now operated under WRAP, see below.

WRAP

Launched in 2000, WRAP's initial purpose was to facilitate recycling in the UK and create markets for recyclates. WRAP works with many organisations including individuals, SMEs,

⁸⁵ Food Manufacture website: Job losses at Envirowise as resource efficiency agencies brought under WRAP umbrella, accessed at <http://www.foodmanufacture.co.uk/Business-News/Job-losses-at-Envirowise-as-resource-efficiency-agencies-brought-under-WRAP-umbrella>

local authorities and the construction sector. The Board is comprised of a Chairman, two executive directors, eight independent non-executive directors and one appointee by Defra. The Scottish and Welsh Governments may also choose to appoint a member of the Board. The Board is responsible for:

- Determining the strategy
- Approving the medium-term business plan and budgets
- Monitoring performance and risks
- Examining the health and safety issues⁸⁶.

The Executive Committee is comprised of the Chief Executive Officer and the senior executive team. It is responsible to the Board for day-to-day operations.

Services provided

Envirowise

Envirowise provided free, confidential, practical advice to business of all sizes on resource efficiency, specifically waste and environmental issues. One of the main means of providing this advice was the Environment and Energy Helpline. The helpline was free to use and businesses could receive up to 2 hours of specialist advice and, if necessary, be referred to other sources of information or publications⁸⁷.

Under the programme, experts were also available to complete on-site audits. During the visits the consultants gathered baseline data and analysed the processes and procedures. This information was used to produce a report and customised action plan. Businesses received a follow-up visit some time afterwards to monitor progress and address any queries.

There are more than 700 resource efficiency reference publications, including Best Practice Guides, Environmental Performance Guides (benchmarking) and case studies⁸⁸. A wealth of information was also available via the website and through workshops and events, where businesses had the chance to 'ask the expert'.

These services are now delivered through WRAP.

Duration of support

The type and length of support varied depending on the needs of the company. It could range from a single visit to the website, to a 2 hour phone call, to an audit and subsequent follow-up visit.

⁸⁶ WRAP website: Company structure and governance, accessed at <http://www.wrap.org.uk/content/governance-1>

⁸⁷ Haigh, K. (Envirowise): Reduce Waste, Increase Profit! An Introduction to Envirowise (presentation), accessed at http://www.brentwood.gov.uk/pdf/pdf_1286.pdf

⁸⁸ Reduce the Use website: Envirowise, accessed at <http://www.reducehouse.co.uk/envirowise>

Monitoring & evaluation

B.3 Results

Service uptake

Whilst it has not been possible to identify the number of businesses participating in the Envirowise programme, some outcomes for 2006 have been identified:

- 550,000 unique website visits
- More than 85,000 publications were distributed
- Specific advice was given to over 5,500 callers via the helpline⁸⁹.

Economic, social and environmental impacts

Envirowise

In 2006, businesses saved £297 million, 84,000 tonnes of raw materials, 17 million m³ of water and 550,000 tonnes of solid waste⁹⁰.

Due to the subsuming of Envirowise and WRAP in 2010, it has not been possible to identify any recent figures regarding the outcomes of the programme. Table B1.1 shows the outcomes for Envirowise's core activities for 2006/07 (note these have no persistence attributed). The 'Value for money' calculations are based on a budget of £12.6 million excluding VAT.

Metric	Result	Metrics delivered per £ spent
Increased sales	Not reported	-
Cost savings	£122m	£9.68
Virgin raw material savings	62,700t	0.00498t
Greenhouse gas savings	85,500t/CO ₂ equivalent	0.00679t/CO ₂ equivalent
Water savings	11,500,000m ³	0.913m ³
Waste diverted from landfill	466,000t	0.0370t
Hazardous waste savings	986t	0.0000782t

Outcomes for the Resource and Efficiency Clubs have been reported separately, Table B1.2, note these include attribution. The 'Value for money' calculations are based on a budget of £1.65 million excluding VAT.

⁸⁹ Envirowise (2007): Memorandum by Envirowise, accessed at <http://www.parliament.uk/documents/lords-committees/science-technology/st1envirowise.pdf>

⁹⁰ Envirowise (2007): Memorandum by Envirowise, accessed at <http://www.parliament.uk/documents/lords-committees/science-technology/st1envirowise.pdf>

⁹¹ Defra (2009): Business Resource Efficiency and Waste (BREW) Programme – Disaggregated Metrics Results for 2006/07, accessed at www.archive.defra.gov.uk/environment/business/support/documents/0607-disaggregated-metrics-report.pdf

Table B1.2: Outcomes from Envirowise’s Resource Efficiency Clubs in 2006/07⁹²

Metric	Result	Metrics delivered per £ spent
Increased sales	Not reported	-
Cost savings	£6.59m	£3.99
Virgin raw material savings	6,340t	0.00384t
Greenhouse gas savings	8,360t/CO ₂ equivalent	0.00507t/CO ₂ equivalent
Water savings	435,000m ³	0.264m ³
Waste diverted from landfill	37,800t	0.0229t
Hazardous waste savings	409t	0.000248t

In a presentation given by Kate Haigh it is reported that, since its launch, Envirowise helped businesses to save over £1.3 billion, equating to £10 saved for every £1 spent on the programme⁹³. The total period over which this outcome was realised is unclear.

WRAP

The annual impacts from WRAP activities in the 2008-2011 business plan period are shown in Table B1.3⁹⁴. The overall savings include activities which were not originally included in the target.

Table B1.3: Impacts resulting from WRAP activities with partners in the 2008-11 business plan period⁹⁵

Indicator	Target	Like-for like impact against target	%	Overall impact
Waste diverted from landfill (tpa)	8 million	11.3 million	141	12.6 million
CO ₂ e emissions avoided (tpa)	5 million	5.5 million	110	6.6 million
Economic benefits (pa)	£1.1 billion	£2 billion	182	£2.2 billion
<i>Costs savings (pa)</i>	<i>£818 million</i>	<i>£1.8 billion</i>	<i>220</i>	<i>£1,9 billion</i>
<i>Sales growth (pa)</i>	<i>£282 million</i>	<i>£268 million</i>	<i>95</i>	<i>£376 million</i>
Water conserved (m3pa)	n/a	n/a	n/a	5.7 million

WRAP Cymru worked with the recycling and reprocessing sector to help SMEs divert commercial and industrial waste from landfill, saving £10.3 million.

⁹² Defra (2009): Business Resource Efficiency and Waste (BREW) Programme – Disaggregated Metrics Results for 2006/07, accessed at www.archive.defra.gov.uk/environment/business/support/documents/0607-disaggregated-metrics-report.pdf

⁹³ Haigh, K. (Envirowise): Reduce Waste, Increase Profit! An Introduction to Envirowise (presentation), accessed at http://www.brentwood.gov.uk/pdf/pdf_1286.pdf

⁹⁴ WRAP (2012): Towards Resource Efficiency – WRAP Business Plan 2008-11 A Report on Impact, accessed at <http://www.wrap.org.uk/sites/files/wrap/WRAP%20Business%20Plan%20Review.pdf>

⁹⁵ WRAP (2011): Methods used to calculate WRAP’s impacts 2008-11, accessed at [http://www.wrap.org.uk/sites/files/wrap/Methods used to calculate WRAP s impacts 2008-2011.pdf](http://www.wrap.org.uk/sites/files/wrap/Methods%20used%20to%20calculate%20WRAP%20s%20impacts%202008-2011.pdf)

The WRAP business plan for the period 2011-15 has set the following targets, which serve as a useful guide for the future outcomes of the programme:

- 7 million tonnes less CO₂ (equivalent) emitted per year
- 3 million tonnes less biodegradable waste going to landfill per year
- £1.9 billion saved by consumers, businesses and the public sector per year
- £130 million growth in the resource management sector per year
- 3 million tonnes less primary resources used per year
- 2 million tonnes less waste produced per year⁹⁶.

Since 2010, WRAP has assumed the activities of Envirowise; the following case studies provide examples of hands-on activities by WRAP in SMEs to promote resource efficiency.

The Authentic Food Company⁹⁷

The Authentic Food Company manufactures an extensive range of premium, frozen, international ready meals and snacks for major supermarkets, food wholesalers and the hospitality sector. The company is family-owned and employs 249 people with a turnover of £40 million in 2012/13.

Following a visit from a WRAP advisor to the Manchester facility, the following opportunities were identified:

- Changing from high pressure sodium lighting to LED lighting could reduce energy costs by £800 per year
- Diverting food waste from landfill to anaerobic digestion could save £8,400 per year
- Compacting cardboard and renegotiating the contract, could generate £11,000 per year, more if the practice is extended to all sites
- When vehicles need replacing, opt for biodiesel to enable waste oil from the factory to be used, creating a saving of £4,000 for every 10,000 litres of fuel purchased.

Laleham Healthcare⁹⁸

Laleham Healthcare specialises in product development and contract manufacture of toiletries and pharmaceuticals.

Following a free Rippleffect site visit by WRAP potential savings were identified amounting to 10,000m³ and £28,500 per year. Actions included development of standard procedures for cleaning processed equipment, the use of mains water instead of de-ionised water where possible and a review of the frequency and water used for boiler blowdown.

⁹⁶ WRAP website: Business Plan 2011-15, accessed at <http://www.wrap.org.uk/content/business-plan-2011-15-0>

⁹⁷ WRAP website: Resource efficiency case study: The authentic Food company, accessed at <http://www.wrap.org.uk/content/authentic-food-company>

⁹⁸ WRAP website: Water efficiency case study: Laleham Healthcare, accessed at <http://www.wrap.org.uk/content/water-efficiency-case-study-laleham-healthcare>

B.4 Costs

Expenditure

Defra funding for the Envirowise and WRAP programmes from 2005/06 to 2009/10 is shown in Table B1.4. The budget from Defra for WRAP's administration and programme costs in 2012/13 was 28.8 million, although this has reportedly been cut to £25.74 million for 2013/14⁹⁹. WRAP expect the budget for 2014/15 to be approximately £18 million¹⁰⁰.

Year	Funding from Defra (£ million)	
	WRAP	Envirowise
1997/08	-	7
1998/99	-	7
1999/00	-	6
2000/01	-	7
2001/02	9	4
2002/03	21	6
2003/04	24	6
2004/05	56	5
2005/06	72	12
2006/07	66	16 ¹⁰²
2007/08	62	22
2008/09	43	9
2009/10	43	9

Sources of funding

Envirowise received funding from DTI and Defra.

WRAP is funded by Defra (England), Welsh Assembly Government, Scottish Government and Northern Ireland Assembly.

B.5 Best practice examples

When operational, Envirowise succeeded in improving the resource efficiency of SMEs, and since 2010 WRAP has continued these successes. With the subsuming of several programmes into WRAP, it effectively provides a one-stop-shop facility to businesses for information and advice on resource efficiency, specifically sustainable waste management.

⁹⁹ Resource website: WRAP budget cut by 11 per cent, accessed at http://www.resource.uk.com/article/Latest/WRAP_budget_cut_11_cent-2582#.UrL-oOJ_Mcs

¹⁰⁰ WRAP website: WRAP response to Defra budget settlement, accessed at <http://www.wrap.org.uk/content/wrap-response-defra-budget-settlement>

¹⁰¹ They Work for You website: Departmental Public Expenditure – Energy and Climate Change, accessed at <http://www.theyworkforyou.com/wrans/?id=2009-03-10b.257667.h>

¹⁰² £14.132m of BREW funding for administration and programme operations and £1.941m from the Resource Efficiency Club scheme

This combining of programmes under one body should foster improved efficiency in terms of support service delivery, avoid duplication and highlight service gaps.

Many of the services available to SMEs are bespoke and customised to their needs, for example, during on-site audits, consultants will analyse processes and produce an action plan based on this information along with baseline data from the company's facility. The helpline allows businesses to get answers to questions which are specific and relevant to them.

Achievements of audits and other activities within individual businesses are promoted through case studies; these can be found on the WRAP website.

The services available to SMEs are available free of charge and, as far as can be discerned, a particular business can use as many of these services as they wish. For those requiring more support and advice, this long-term support is fundamental to realise successes in terms of resource efficiency.

B.6 Potential gains

No information identified.

C. Bright Green Business, United Kingdom (Scotland)

C.1 Objectives

The Bright Green Business initiative has operated in Scotland for over 20 years and runs several programmes which seek to improve the resource efficiency of SMEs. Those of relevance to this project are:

Student and graduate placements

There are three types of placement, Environmental Placement Programme (EPP), Step Classic and Graduate Step. Projects under the former include carbon footprinting, energy, waste and water, ISO 14001, GTBS, new product development and marketing green credentials¹⁰³.

Environmental Management Systems

This programme supports the implementation of the Green Ticks Environmental Management System (EMS) through simplified procedures and support towards the annual maintenance and improvement of the EMS.

¹⁰³ Bright Green Business website: Student & Graduate Placements – How it works, accessed at <http://www.brightgreenbusiness.org.uk/services/student-graduate-placements/>

Environmental services

Under this programme, SMEs are given hands-on support to improve their environmental performance. Services include the provision of bespoke action plans, preparation of legal compliance registers or provision of an ad-hoc environmental manager. On-site visits from experts also provide additional support in undertaking system maintenance duties, such as internal auditing.

C.2 Programme structure and approach

Programme structure

The Bright Green Business was formed in April 2013, following the combining of two former subsidiary companies, Green Business Partnership and Bright Business Partnership. The scheme was originally established in 1998 and known as the Business Environment Partnership and Essential HR. It is one of three trading organisations of The Business Partnership Ltd, along with Bright Green Hydrogen and the Mid & East Lothian Chamber of Commerce¹⁰⁴.

The initiative is partnered and sponsored by the Scottish Environment Protection Agency, Step, Business Gateway and the Scottish Government.

Services provided

Within the programmes identified above there are a number of free services and activities targeting resource efficiency in businesses, these include:

- Resource efficiency advice
- On site resource efficiency audits
- Assistance with EMS certification
- Carbon management/environmental training
- Bright Green Business Network scheme and events¹⁰⁵.

It is unclear how much these services cost and/or whether they are part funded by the Bright Green Business initiative.

Duration of support

The length of support businesses receive is dependent on the services they wish to utilise. Support may well continue for several years if a business participates in the EPP each year.

¹⁰⁴ Bright Green Hydrogen website: History, accessed at <http://brightgreenhydrogen.org.uk/history/>

¹⁰⁵ Bright Green Business Network website: Home, accessed at <http://brightgreenbusinessnetwork.org.uk/>

Monitoring & evaluation

C.3 Results

Information regarding the outcomes of all the programmes under the Bright Green Partnership is not readily available. The EPP programme is assessed below.

Service uptake

The EPP has run for over 12 years and there have been more than 700 placements to date into over 500 businesses. Projects have identified over £10M worth of cost savings, diverted more than 80,000 tonnes of waste from landfill, created more than 80 green jobs and reduced CO₂ emissions by 33,000 tonnes¹⁰⁶.

During 2008, there were 58 placements in 50 companies, with the following achievements:

- 1,956 tonnes of waste diverted from landfill
- 2,540 tonnes of CO₂ saved
- 2,846m³ water/effluent saved
- £827,899 cost savings¹⁰⁷.

It has not been possible to identify information regarding the service uptake for the Green Tick EMS and Environmental Services programmes.

Economic, social and environmental impacts

The following case studies provide more detail concerning the outcomes of the EPP programme.

Grant Westfield¹⁰⁸

Based in Edinburgh, Grant Westfield is an interior building design company, specialising in cubicle systems for toilets, washrooms and changing rooms. In 2012, the company took on a student through the EP, which resulted in the implementation of an EMS and the creation of a permanent role for the student. Specific measures include solar panels on roof, planning application to install a biomass boiler and implementation of the Green Ticks EMS.

¹⁰⁶ Bright Green Placements website: EPP, accessed at <http://employers.brightgreenplacements.org.uk/epp/>

¹⁰⁷ Schweitzer-Thompson, B. (Business Environment Partnership) (2008): Environmental Placement Programme (presentation), accessed at <http://www.docstoc.com/docs/125270822/Environmental-Placement-Programme>

¹⁰⁸ Bright Green Business: Environmental Awareness in Edinburgh Businesses (presentation), accessed at http://www.edinburgh.gov.uk/download/meetings/id/39866/item_5_1-presentation_by_bright_green_business.

TIO Ltd¹⁰⁹

TIO Ltd is a root crop specialist, processing carrots, parsnips and swede. They employ around 70 people and have a turnover of more than £10 million per year. They took on a student through the scheme in 2011 and 2012, with the intention of reducing their carbon footprint and reducing waste. The placement generated the following results:

- Reduced energy bill by more than 20%
- Anticipate increasing recycling rate from 9% in 2011 to 65% in 2012;
- During the 2010 placement, savings of £34,000 pa were identified; many of the measure were low cost, e.g. replacing paper towels with a hand dryer and a new lighting plan.
- The 2011 placement focuses on the company's waste management. After finding an outlet for waste plastic, the amount to landfill fell from 91% to 35%.

C.4 Costs

Expenditure

No information identified

Sources of funding

The EPP is part funded by the Scottish Government and has support from a range of organisations including the SERES Groups, Energy Saving Trust, Carbon Trust, Zero Waste Scotland, Scottish Business in the Community, Scottish Enterprise as well as The Royal Society of Edinburgh, Edinburgh Council, Dundee Renewables, SEPA and VIBES.

C.5 Best practice examples

There are several programmes operating under the Bright Green Business initiative, three of which deal with resource efficiency, this 'one-stop-shop' provides obvious benefits to businesses.

The placement programme provides a unique opportunity for businesses and students, with each benefiting in different ways. The scheme has proved successful, with many of the participating businesses hosting more than one placement.

The initiative takes an holistic approach to resource efficiency and also operates programmes which focus on other business topics, such as recruitment and HR.

The programme is partnered and sponsored by several organisations including the Scottish Environment Protection Agency. Whilst it is not clear how they are involved with the day-to-day operation of the programmes, it no doubt provides credibility and word of mouth.

¹⁰⁹ Bright Green Placements website: TIO – Environmental Placement Programme, accessed at <http://employers.brightgreenplacements.org.uk/case-studies/tio-environmental-placement-programme/>

C.6 Potential gains

No information identified.

D. Business to Business (B2B) Green Mentors Programme, Ireland

D.1 Objectives

The Business to Business (B2B) Green Mentors Programme ran for 18 months from January 2005 to June 2006. It was funded by the Irish Environmental Protection Agency (EPA) and managed by the Limerick/Clare/Kerry Regional Waste Management Office (RWMO)¹¹⁰.

The programme encouraged companies who had good waste management practices, typically larger companies, to become green mentors and provide advice and guidance to smaller companies who do not have the expertise and resources to develop sustainable waste management practices¹¹¹.

D.2 Programme structure and approach

Programme structure

The project was run by the Limerick/Clare/Kerry RWMO on behalf of the Local Authorities in the region. Within the RWMO there were five members of staff, three of which had some involvement in the project. The project was co-ordinated by the Regional Waste Minimisation Officer. The services of an external consultant were used to provide on-site assistance to participating SMEs. The technical consultant provided approximately 25 days of support and helped to deliver training events, visits and support for individual SMEs.

Services provided

SMEs were given the opportunity to visit mentor companies to observe sustainable waste management practices first hand. This was followed up with visits to the individual SMEs by the technical consultant and the provision of advice and ongoing support for the duration of the project.

The services were free of charge to participating companies.

Duration of support

The project lasted for 18 months, during this time SMEs were provided with support through events and face-to-face consulting.

¹¹⁰ EPA Environmental Protection Agency website: Business to Business (B2B) Green Mentors, accessed at <http://www.epa.ie/newsandevents/news/previous/2005/name.47935,en.html#.Uo81JOLjWYY>

¹¹¹ Pers. Comm., Dec 2013

D.3 Results

Service uptake

During the 18 months, a total of 60 SMEs participated¹¹².

Economic impacts

It was not possible to quantify the overall outcomes for the project or all of the participating companies due to the lack of a robust baseline. Additionally, many of the companies had plans for ongoing or further improvements which could not be quantified at the end of the project's official timeframe. However, the project team have produced case studies for some of the participating companies, as shown in Table D1-1. The outcomes vary but are mostly centred on the savings associated with reduced disposal costs.

Company	Action	Result
A, Ennis, Co. Clare	<ul style="list-style-type: none"> Investment in a Power Factor Controller system in order to reduce electricity consumption. 	<ul style="list-style-type: none"> Reduced electricity usage and resultant cost savings of 5%.
C, Medical distribution	<ul style="list-style-type: none"> Awareness training for all staff. Reuse of incoming packaging, optimisation of packaging (no voids). Waste segregation programme, including paper, cardboard, plastic & tin, wet waste and WEEE. 	<ul style="list-style-type: none"> 50% reduction in disposal costs.
D, Manufacturer of corrugated packaging	<ul style="list-style-type: none"> Reduce trim on packaging from 40mm to 25mm Raise awareness among staff. Supplier takes back scrap pallets at no cost. Measurement process in place to reduce waste Use of residue at barrel end (longer pump bought). 	<ul style="list-style-type: none"> Reduced trim saves €2,000 each month. Use of longer pump saves €100 per month.
F, Precision Engineering	<ul style="list-style-type: none"> Achieve ISO 14001 certification. Full segregation of waste to increase recycling. 	<ul style="list-style-type: none"> Skip (landfill waste) pick-ups reduced by 50%. 40% of waste diverted from landfill. Annual savings of at least €5,000.
G, Wood Products	<ul style="list-style-type: none"> Waste reduction and full segregation for recycling. Install equipment for production of wood pellets. 	<ul style="list-style-type: none"> Anticipated savings of €1,000 on timber removal. Income from pellets – 16 tonnes @ €2,000.

Although the project's official timeframe was 18 months, in reality the support extended beyond this point. The mentoring continues in an unofficial capacity; best practice companies are invited to present case studies at regional events organised by the Regional

¹¹² Pers. Comm. Dec 2013

¹¹³ Business to Business Green Mentor Programme: Case Study Examples of companies who benefitted from the B2B Green Mentor Programme (Jan 2005 – June 2006)

Waste Management Office¹¹⁴. These case studies are also included in the regular business newsletters.

In some instances, mentoring companies have maintained contact with SMEs, particularly those in their supply chain, for example members of the Supply Network Shannon.

The Regional Waste Management Office is also launching another project, 'Encouraging Corporate Social Responsibility among SMEs', which will be funded by the Environmental Protection Agency (EPA)'s national Green Enterprise Programme and which is set to replace the CGPP.

Supply Network Shannon

Supply Network Shannon (SNS) is an industry-led initiative which aims to represent, promote, develop and connect companies in the Shannon region of Ireland. The network operates in thirteen sectors and provides the following benefits to businesses:

- Strong, visible identity for the supply network which is synonymous with high-quality goods and services, whilst also strengthening international competitiveness of the region
- Network gives the facility for companies to exchange information for the mutual benefit of the sector
- Activities such as visits, training courses, seminars and workshops
- Allows member companies to utilise all available resources in their marketing efforts
- Performance data from participants can help to develop the region
- Cooperative activities in the sector through strategic partnerships¹¹⁵.

In 2013, the SNS was successful in gaining funding from Phase 6 of the EPA's Cleaner Greener Production Programme and the EPA's National Waste Prevention Programme for the 'Supply Network Shannon - Promoting Resource Efficiency in the Supply chain' project.

Recent events held by SNS include the Manufacturing Exhibition in May 2013; run in association with SMILE Resource Exchange. This was a free event (exhibitors paid a fee) for SMEs and sub-contractors in the Munster region of Ireland. The event provided access to various industries in the region and seminars on the subjects of Process Improvement and Resource Efficiency¹¹⁶. At the event, the SMILE Resource Efficiency programme also held a facilitated networking event.

¹¹⁴ Pers. Comm. Jan 2014

¹¹⁵ Demacon (2009): Saldanha Development Zone Pre-Feasibility Analysis – Final Report, p. 162, accessed at http://www.sbm.gov.za/pages/IDZ_LED/IDZ/Pre-Feasibility%20Analysis%20Final%20Report_Chapter%207.pdf

¹¹⁶ Supply Network Shannon (2013): SNS Manufacturing Exhibition, accessed at http://www.limceb.ie/wp-content/uploads/2013/05/Sns-Manufacturing-Exhibition_SMILE-Facilitated-Networking_29May2013.pdf

In September 2013, SNS held a free workshop which provided guidance to businesses on how to achieve improvements and potential cost savings in areas including energy efficiency, resources and waste prevention¹¹⁷.

D.4 Costs

Expenditure

The costs of the project which ran from January 2005 to June 2006 were €109,855¹¹⁸.

Sources of funding

The EPA provided 35% of the funding as Grant aid provided by the Department of Environment, Heritage and Local Government, through the Environmental RTDI Sub-measure of the Productive Sector Operational Programme of the National Development Plan¹¹⁹. The remainder (65%) was funded by the Regional Waste Management Office which, in turn, is funded by local authorities in the region.

D.5 Best practice examples

Local contacts were established between larger mentor companies and smaller companies in the immediate neighbourhood and throughout the region. This made for beneficial networking among the different businesses, as well as facilitating local transfer of information.

Independent consultants were used during the audits to individual SMEs, which ensured impartial advice and expertise.

D.6 Potential gains

SMEs could especially benefit along the supply chain, i.e. with larger clients taking a specific interest in providing advice and guidance on resource efficiencies among their smaller supplier companies. One example of a sub-supply network in the region comprises 40 members which could benefit from such a supply-chain mentoring programme.

¹¹⁷ Facebook website: SNS Workshop – Promoting Resource Efficiency in the Supply Chain, accessed at <https://www.facebook.com/events/171354133049374/>

¹¹⁸ Pers. Comm. Dec 2013

¹¹⁹ Pers. Comm. Dec 2013

E. Green Business Initiative, Ireland

E.1 Objectives

Launched in 2008, the Green Business Initiative is a collection of inter-linked projects which aim to help businesses reduce their environmental impacts by improving their resource efficiency¹²⁰. It takes an holistic approach, targeting the consumption of energy, water and raw materials.

E.2 Programme structure and approach

Programme structure

The programme is led by the Environmental Protection Agency with support from the Department of the Environment, Heritage and Local Government¹²¹.

Green Business has partnered with several other resource efficiency initiatives across Ireland, including Green Hospitality Programme, Local Authority Prevention Network and SMILE Resource Exchange¹²².

Services provided

SMEs can request a free Resource Efficiency Assessments (REA), which is carried out by a Green Business Advisor. Audits are followed up by a customised report which contains recommendations and resource efficiency opportunities, including no or low cost measures. These reports are confidential and not shared with third parties. Green Business provides a follow up visit after 6 months to provide further assistance.

Other services include workshops and events held throughout the year which members can attend free of charge.

A number of tools can be accessed via the website, including the Waste Audit Tool and the Waster Audit and Value Estimator. The website also hosts useful case studies (see below), tips and more general information.

All services are free of charge to SMEs.

Duration of support

Support to SMEs is on-going, with follow up visits after 6 months.

¹²⁰ EPA website: Green Business Initiative, accessed at www.epa.ie/waste/nwpp/gbi/#.Urf39rR_Mcs

¹²¹ European Commission website: Green Business Initiative Ireland, accessed at http://ec.europa.eu/environment/sme/cases/greenbusiness_en.htm

¹²² Green Business website: Partners, accessed at <http://greenbusiness.ie/about-us/stakeholders/>

E.3 Results

Service uptake

James Hogan, the Programme Manager of the Green Business Initiative gave a presentation at the Green Business Winter Seminar 2013 and reported that on-site REA have been completed in 300 facilities to date¹²³. The 2012 Annual Report produced by the EPA states that there are more than 700 active members¹²⁴.

Economic impacts

The Environmental Protection Agency estimates savings to businesses in the region of €1.35 million in 2010¹²⁵ and €4 million in 2011¹²⁶.

It is estimated that, to date, the REA have identified €18 million of savings, equating to an average of €60,000 per company (71% energy, 15% Materials, 7% Waste and 7% water), with €20,000 deemed as no or low costs measures with payback in less than 1 year (36% materials, 30% energy, 21% waste and 13% water)¹²⁷.

The case studies in Table E1-1 provide more specific outcomes from participating businesses.

Name	Details	Financial benefits	Environmental benefits
Atlas Box and Crating Co. Ire Ltd ¹²⁸	Number of measures put in place between 2010 and 2012 following a Resource Efficiency Assessment.	Cost savings: €12,368/annum Investment: €1,800	CO ₂ reduced: 27 tonnes pa Water reduced: 267m ³ pa
Pig Processor ¹²⁹	Reduced average flow of cleaning hoses from 26 litres/min to 20 litres/min.	Cost savings: €42,000/annum Investment: €0 Payback: Immediate	CO ₂ reduced: 90 tonnes pa Water reduced: 7,000m ³ pa
Dunamais Arts Centre	Upgrades to lighting, including replacement of halogen spotlights with	Costs saving: €3,400 Investment: €500	

¹²³ Green Business (2013): Presentation - Green Business – Resource Efficiency Seminars – winter 2013, accessed at <http://greenbusiness.ie/uncategorized/green-business-winter-seminar-a-great-success/>

¹²⁴ EPA (2013): National Waste Prevention Programme – Annual Report 2012, accessed at http://www.epa.ie/pubs/reports/waste/prevention/NWPP%202012_web.pdf

¹²⁵ EPA (2011): Resource Efficiency in the Green Economy – Ireland Experience, accessed at <http://www.bangor.ac.uk/business/documents/GIFTLaunchJonathanDerham.pdf>

¹²⁶ EPA (2013): Resource Efficiency – The Smarter Way of Doing Things (Presentation), accessed at <http://greenbusiness.ie/wp-content/uploads/2013/11/EPA-Keiron-Philips.pdf>

¹²⁷ Green Business (2013): Presentation - Green Business – Resource Efficiency Seminars – winter 2013, accessed at <http://greenbusiness.ie/uncategorized/green-business-winter-seminar-a-great-success/>

¹²⁸ EPA: Case study – Atlas Box and Crating Co. Ire Ltd. Save €12,300 Per Annum Through Better Efficiency, accessed at <http://greenbusiness.ie/wp-content/uploads/2013/09/AtlasF0041.pdf>

¹²⁹ EPA: Case study – Pig Processor Could Reduce Cleaning Costs by €42,000 by Reducing Water Flows from Hoses, accessed at <http://greenbusiness.ie/wp-content/uploads/2013/09/Pig-Processor-Case-study-F001.pdf>

Table E1-2: Green Business Initiative participant case studies

Name	Details	Financial benefits	Environmental benefits
Theatre ¹³⁰	LED units, removal of excess lighting and switching off unused lights.	Payback: approx. 2 months	
Office block ¹³¹	Oil boiler (70% efficient) was replaced with a gas boiler (92% efficient). Also savings linked to the lower unit price for gas compared to oil (gas 50% cheaper). Fuel costs estimated to be 68% less.	Investment: €25,300 Potential annual fuel Saving: €25,800 Payback: <1 year	
Food processing plant ¹³²	Replaced T8 florescent lights with T5 florescent lights, leading to a 40% reduction in energy use.	Investment: €9,000 Energy savings: €15,000 Payback: 7 months	

E.4 Costs

Expenditure

In 2012, the Green Business Initiative received €0.34 million of National Waste Prevention Programme investment and was estimated to produce actual and potential savings of around €3 million, giving a return on investment of 9:1¹³³.

Sources of funding

The programme is funded by the Environmental Protection Agency under the National Waste Prevention Programme.

E.5 Best practice examples

The initiative provides a range of services, all of which lead to an holistic approach towards resource efficiency.

There are several best practice methods which the on-site Resource Efficiency Audits provide, these include:

- A bespoke service in the form of a customised report based on their baseline data and processes
- Independent evaluation of processes etc. by Green Business Advisors

¹³⁰ EPA: Case Study – Lighting Upgrade at Dunamais Arts Centre, accessed at <http://greenbusiness.ie/wp-content/uploads/2013/03/Dunamais-1-case-study.pdf>

¹³¹ Green Business (2013): Presentation - Green Business – Resource Efficiency Seminars – winter 2013, accessed at <http://greenbusiness.ie/uncategorized/green-business-winter-seminar-a-great-success/>

¹³² Green Business (2013): Presentation - Green Business – Resource Efficiency Seminars – winter 2013, accessed at <http://greenbusiness.ie/uncategorized/green-business-winter-seminar-a-great-success/>

¹³³ EPA (2013): National Waste Prevention Programme – Annual Report 2012, accessed at http://www.epa.ie/pubs/reports/waste/prevention/NWPP%202012_web.pdf

- Long term support through follow up visits.

F. Green Business Network, United Kingdom (NW England)

F.1 Objectives

Green Business Network has been running for 15 years and provides environmental advice and support to local businesses in Kirklees and Calderdale¹³⁴.

F.2 Programme structure and approach

Programme structure

The Green Business Network was originally set up as a partnership between Kirklees and Calderdale Councils and the Rural Development Commission to deliver environmental audits to businesses and was one of the major aspects of the Agenda 21 work within each Council¹³⁵.

The staff of the Green Business Network work within the councils alongside council workers. This arrangement provides more continuity between teams and improves communications. Both Kirklees Council and Calderdale Council provide information about and links to the Green Business Network on their websites.

Services provided

The network provides businesses with impartial and confidential advice and hands-on support to improve their resource efficiency. Their services include:

- Environmental audits
- Environmental toolkits
- Environmental Management Systems
- Carbon footprinting service
- Environmental databases
- Events and news¹³⁶.

All the services are available free of charge.

¹³⁴ Green Business Network website: About the Green Business Network, accessed at <http://greenbusinessnetwork.org.uk/about/about-the-green-business-network>

¹³⁵ Calderdale Council (2011): Report of the Director, Economy and Environment – Green Business Network, accessed at http://www.calderdale.gov.uk/nweb/COUNCIL.minutes_pkg.view_doc?p_Type=AR&p_ID=11837.

¹³⁶ Green Business Network website: Business Advice, accessed at <http://www.greenbusinessnetwork.org.uk/business>

Duration of support

It is unclear how long support is available, although this is likely to vary depending on the needs of the business.

F.3 Results

Service uptake

Between 1995 and 2005, GBN has provided advice and assistance to over 1,500 businesses, with over 200 securing financial support to implement projects¹³⁷.

Economic, social and environmental impacts

Whilst it has not been possible to identify any historic achievements, the expected outcomes for businesses in Calderdale only for 2011-2014 are shown below and act as a useful guide:

- Direct support to 100 businesses
- 1,200 Calderdale businesses attending Green Business Network events
- 120 Energy and Resource use Audits completed
- 36 press releases about projects and achievements in Calderdale
- 15 businesses achieve an Environmental Management System
- 30 events held or attended
- 3 Green Business Best Practice Award Events delivered
- 3 new social enterprises developed in Calderdale
- An Energy and Resource Efficiency Knowledge Transfer Hub
- A full profile of Calderdale businesses working in green technologies¹³⁸.

It is expected that these actions will result in various environmental, social and financial benefits for businesses:

- 5,000 tonnes of CO₂ saved per year from baseline
- €122,700 saved through identified measures
- 120 people attending training schemes
- 2 new jobs directly funded by the proposal
- 4 new jobs through social enterprise development
- 30 existing businesses expanding into the green industries resulting in increased income
- 15 new jobs created¹³⁹.

¹³⁷ Greyland website: Environment, accessed at <http://www.greyland.co.uk/#/environment>

¹³⁸ Calderdale Council (2011): Calderdale performance reward grant – Business case template, accessed at <http://www.calderdaleforward.org.uk/archive/documents/business%20cases/105%20-%20CMBC%20E&E%20Green%20Business%20Network.doc>.

¹³⁹ Calderdale Council (2011): Calderdale performance reward grant – Business case template, accessed at <http://www.calderdaleforward.org.uk/archive/documents/business%20cases/105%20-%20CMBC%20E&E%20Green%20Business%20Network.doc>.

F.4 Costs

Expenditure

When the Green Business Network was first established, it had an annual budget of approximately €50,000, with the remit of providing advice to 10 SMEs¹⁴⁰.

There is little available information concerning the expenditure of the GBN. Table F1-1, summarises costs which were presented in a Calderdale Performance Reward Grant form.

Details	Capital	Revenue
Project Officer		€138,297
Small grants scheme	€69,149	
Office – rent/rates/heat/light/cleaning		€25,931
Support Officer costs		€107,180
Telephones/stationary/copying/postage	€5,186	
Publicity/printing/events		€17,287
GBN Support/Supervision		€41,489

Sources of funding

The Green Business Network is funded by Kirklees and Calderdale Councils. From 1995 to 2005, over €10.7 million of funding has been secured from various sources, including landfill tax and matched private funds¹⁴².

A completed Calderdale Performance Reward Grant form completed by Calderdale Council in February 2011, requested approximately €415,000 of funding to support the Green Business Network in Calderdale¹⁴³.

No details have been found concerning the amount of funding provided by Kirklees Council, however the Calderdale Performance Reward Grant form reports that Kirklees provided around €118,100 for back office support and a Kirklees based environmental advisor.

F.5 Best practice examples

Originally set up in partnership and integrated with local authorities, the Green Business Network benefits from their direct support. Businesses can also benefit from the link between the providers of several services. The use of local delivery partners over regional

¹⁴⁰ Greyland website: Environment, accessed at <http://www.greyland.co.uk/#!environment>

¹⁴¹ Calderdale Council (2011): Calderdale performance reward grant – Business case template, accessed at <http://www.calderdaleforward.org.uk/archive/documents/business%20cases/105%20-%20CMBC%20E&E%20Green%20Business%20Network.doc>.

¹⁴² Greyland website: Environment, accessed at <http://www.greyland.co.uk/#!environment>

¹⁴³ Calderdale Council (2011): Calderdale performance reward grant – Business case template, accessed at <http://www.calderdaleforward.org.uk/archive/documents/business%20cases/105%20-%20CMBC%20E&E%20Green%20Business%20Network.doc>.

or indeed national partners, means that the unique needs of local businesses are more widely understood and, as a result the services, are more effective.

A holistic approach to resource efficiency provides an efficient solution for local businesses that do not need to engage with several programmes in order to reduce their environmental impacts and costs.

The environmental audits provide a bespoke service to SMEs, through identification of key issues affecting the business and the provision of a prioritised action plan.

G. GreenStart and GreenPlus, Ireland

G.1 Objectives

GreenStart is intended to raise awareness of environmental regulations whilst also highlighting the potential environmental and financial benefits for a company as a result of improved environmental practices¹⁴⁴.

GreenPlus is intended to build on the GreenStart programme, and enables business to further increase their resource efficiency and, in doing so, improve their competitiveness, reputation and access to Green Public Procurement and private supply chain tenders¹⁴⁵.

G.2 Programme structure and approach

Programme structure

The programmes were devised by Enterprise Ireland, the government body responsible for the development and growth of Irish enterprises in world markets and are part of their Green Offer service.

External consultants are used for site visits, expert advice registered consultancies include KD Environmental and Environmental Efficiency.

Services provided

GreenStart

There are a range of services under the GreenStart programme, all of which are available at no cost to the business. These include:

- Assistance with preparation of an Environmental Policy Statement

¹⁴⁴ Enterprise Ireland website: Build a Green and Sustainable Business, accessed at <http://www.enterpriseireland.com/en/Productivity/Build-a-green-sustainable-Business/>

¹⁴⁵ EnviroCente.ie website: Green Offer, accessed at <http://www.envirocentre.ie/Content.aspx?ID=5099D296-2C06-4262-A498-82608CBCFE99&PID=FA27B05B-3661-42EC-A0BC-942D579781A7>

- A site visit and site audit
- Advice on regulatory compliance issues and how to resolve them
- Advice on environmental issues developing in the market place including Green Public Procurement, supply chain issues and reputation benefits
- Assistance with preparation of eco-maps to deal with site issues
- Assistance with access to SEAI Energy map and Green Business water and waste audit tools to improve resource efficiency¹⁴⁶.

GreenPlus

The programme supports improvement assignments up to €70,000, which typically include implementation of ISO 14001 or a similar standard, reduction of environmental impacts and Technical Feasibility Studies. Measures can include the development of Carbon Management Strategy, Carbon footprinting and attainment of Eco-label or Environmental Product Declaration¹⁴⁷.

The focus of the scheme is resource efficiency; there is no indication of any specialisation and environmental compliance. The third dimension is improved competitiveness on the world market as a result of the former outputs.

Duration of support

Depending on the requirements of the business the length of support can vary. It may range from a single interaction whereby a company seeks advice about environmental compliance and requires no further assistance. Conversely, a business embarking on the journey to improve its environmental performance may seek advice on several occasions and require assistance to develop an Environmental Policy Statement.

G.3 Results

No information identified.

G.4 Costs

No information identified.

¹⁴⁶ Innovation Ireland/Enterprise Ireland (2011): Environmental Challenges and Opportunities for the Construction Sector in Ireland, accessed at <http://www.envirocentre.ie/includes/images/Environmental%20Challenges%20and%20Opportunities%20for%20the%20Construction%20Sector%20in%20Ireland.pdf>

¹⁴⁷ Innovation Ireland/Enterprise Ireland (2011): Environmental Challenges and Opportunities for the Construction Sector in Ireland, accessed at <http://www.envirocentre.ie/includes/images/Environmental%20Challenges%20and%20Opportunities%20for%20the%20Construction%20Sector%20in%20Ireland.pdf>

G.5 Best practice examples

Whilst it has not been possible to identify any outcomes or inputs into the GreenStart and GreenPlus programmes, it is possible to highlight elements of their services which can be described as best practice.

The GreenStart and GreenPlus programmes take an holistic approach to improving resource efficiency by seeking to reduce the overall environmental impact of businesses. The GreenStart programme also covers environmental regulation and compliance, tackling these topics simultaneously is likely to lead to greater successes.

Enterprise Ireland provides a number of services covering various topics, serving as a one-stop-shop for businesses. This approach will probably avoid duplication and confusion for businesses.

The environmental audits are completed by external consultancies, which provide a degree of credibility and expert level advice. The same experts are available to answer specific queries SMEs may have in relation to environmental compliance and resource efficiency.

H. PBE+ (Performance Bretagne Environnement Plus), France

H1. Objectives

PBE+ (Performance Bretagne Environnement Plus) aims to increase the awareness of environmental impacts and promote the Environmental Management System. The programme is based on SMEs initiating actions and taking responsibility for their environmental impacts.

H.2 Programme structure and approach

Programme structure

The PBE+ programme was developed by the Brittany Regional Council and local authorities and runs in collaboration between the regional council, local authorities, Unions, ADEME, the Chambers of Commerce and Electricité de France (EDF).

PBE+ is supported by State, the Region and local Patronal Association. Managed by the Companies Union of Bretagne, with one coordinator (part-time), 4 advisers deployed in the 4 departments and 1 assistant¹⁴⁸.

¹⁴⁸ European Commission: ATLANT-KIS Transnational Cooperation Project – Atlantic Area – Best practices Guide, accessed at http://www.kis4smes.com/userfiles/file/gp_guide.pdf

Services provided

The services of this programme are specifically for SMEs in the Brittany region of France and are aimed at managerial and executive staff.

There are many services that target the various aspects of resource efficiency; those which are of relevance to this project are listed below:

- Training of an Environmental correspondent
- Self-diagnosis of company's environmental performance carried out by the Environmental Correspondent with the support of a PBE+ Councillor
- Energy visit to assess current usage and make suggestions for improvements in the short to long-term
- Pre-diagnosis Eco-design
- Regional thematic days to inform business of changes to legislation or developments in technology
- Half-day training course for businesses to improve their techniques to reduce energy consumption and bills
- Departmental club meeting in each of the counties in Brittany
- EMS compliance audits
- PBE+ Consultants disseminate key texts relating to regulatory information updates
- Annual publication of "Environmental and Industrial Risks"¹⁴⁹.

A key feature of the programme is the training of an 'Environmental correspondent' who, with the support of a PBE+ Councillor, completes an audit of the business. The individuals can keep their knowledge up-to-date by attending clubs, thematic days and exchanges within the network.

SMEs are provided with advice in carrying out environmental assessments, which includes a free two day training course¹⁵⁰. It also establishes networks and facilitates the exchange of knowledge and experience among SMEs to encourage action on environmental performance¹⁵¹.

All of the services are available free of charge to SMEs.

Duration of support

After the initial training of an Environmental Correspondent in a company, the programme provides continued support to SMEs through workshops and thematic days.

¹⁴⁹ Performance Bretagne website: Actions., accessed at <http://www.performance-bretagne.net/index.php/actions-environnement.html>

¹⁵⁰ European Commission website: Performance Bretagne Environnement Plus (PBE+), accessed at http://ec.europa.eu/environment/sme/cases/cases07_en.htm

¹⁵¹ European Commission, Case 7: PBE+, France, accessed at http://ec.europa.eu/environment/sme/pdf/pbe_en.pdf

H.3 Results

Service uptake

Performance Bretagne reports that since 1994, the following has been achieved by the PBE+ programme:

- Close to 1,700 companies have benefited
- Trained 2,500 Environment Correspondents
- Completed 900 self-diagnoses
- More than 10,000 people attended the Regional Thematic Days¹⁵².

In order to improve the programme, feedback questionnaires are distributed at training, self-diagnostic audits, local clubs and thematic days. At the time of writing a case study on PBE+, the European Commission reported that the results of these questionnaires showed that 90% of participants were satisfied¹⁵³.

In 2012, PBE+ carried out a regional awareness day for Breton companies and 8 workshops under the Covenant Electric awareness programme and completed 51 energy visits; subsequently 75% of companies contacted their energy supplier to adjust their subscription¹⁵⁴.

H.4 Costs

Expenditure

In 2010, the budget for the PBE+ programme was €493,117, split as follows: 35% EFRD, 22.17% Regional Council, 22.17% State, 0.65% private¹⁵⁵. Financing of the programme post 2013 is not currently assured.

Sources of funding

The regional council provides 50% of the subsidies and the central government (DRIRE & DRAF) contributes the other 50%. A small part of the funding comes from other organisations.

¹⁵² Performance Bretagne website: Presentation, accessed at <http://www.performance-bretagne.net/index.php/presentation-environnement.html>

¹⁵³ European Commission, Case 7: PBE+, France, accessed at http://ec.europa.eu/environment/sme/pdf/pbe_en.pdf

¹⁵⁴ Meeting minutes from 9th Breton Energy Conference (22nd March 2013), accessed at http://www.plan-eco-energie-bretagne.fr/jcms/c_8335/13-03-22-compte-rendu-9e-conference-vd-annexe

¹⁵⁵ European Commission: ATLANT-KIS Transnational Cooperation Project – Atlantic Area – Best practices Guide, accessed at http://www.kis4smes.com/userfiles/file/gp_guide.pdf

H.5 Best practice examples

The PBE+ programme appears unique in that it encourages businesses to take responsibility for reducing their environmental impact. Self-diagnosis and regular knowledge transfers are fundamental aspects of this approach. Providing guidance, rather than prescriptive measures, allows companies to build up their internal capacity and results in a lasting impact.

The provision of clubs and thematic days gives long-term support to companies and ensures they are up-to-date on any relevant legislation or technology. Regular notifications and publications are also important for the latter.

The programmes benefit from the support of several agencies, including Chamber of Commerce and Industry, Regional council of Brittany and the Departmental Patron Unions.

J. Plan PME, France

J.1 Objectives

‘Plan PME’ (SME Plan) in the Rhône-Alpes region of France aims to strengthen the skills of SMEs in the areas of strategy, information systems, human resources, innovation, export trade and environmental management¹⁵⁶.

J.2 Programme structure and approach

Programme structure

There are a range of support programmes under the initiative focusing on strategy, finance, information systems and the environment among others. Individual programmes are delivered at a regional level by local actors, e.g. CRIT, Chambers of Commerce and Industry and development agencies.

Services provided

There are 19 support programmes under the initiative; those under the environmental component include: ACCES Rhone-Alpes ISO 14001, ACCES Rhône-Alpes Accompagnement de projet Environnement and ACCES Efficacité énergétique – Visites énergie¹⁵⁷.

¹⁵⁶ Semaphores website: I. Presentation of the action, accessed at <http://www.semaphores.fr/observatoire-regions/regions/rhone-alpes/plan-pme-puissante-offre.html>

¹⁵⁷ Rhone-Alpes website: SMES Plan, accessed at http://www.rhonealpes.fr/TPL_CODE/TPL_AIDE/PAR_TPL_IDENTIFIANT/400/PAG_TITLE/Plan+PME/18-les-aides-de-la-region-rhone-alpes.htm

ACCES Rhone-Alpes ISO 14001

This programme seeks to assist with the implementation of ISO 14001, encompassing several aspects of resource efficiency. There are three stages, the first being an initial site visit to determine the current environmental performance of the business. This is followed up by individual support to allow businesses to develop and successfully implement an Environmental Management System (EMS). Finally, the EMS is evaluated through an on-site audit.

Support is provided for up to 16 months, through individual consultation (13 days) and collective time (6 days), see Table J1-1.

Individual consultation	Collective time
1.5 days for an initial assessment with the company director/manager	2 x half-day seminars opening and closing action
9 days of support to build an environmental management system	3 days of mandatory training by a training consultant
2 day visit to evaluate the company's situation vis-à-vis the requirements of ISO 14001	4 x half-day returns international companies to share and capitalize on the experience spread throughout the process
0.5 days for synthesizing the environmental management system with the company director/manager	

The programme is estimated to cost €14,875 (excluding taxes), however 67% is funded by the Rhône-Alpes Region and the EU ERDF, resulting in the company paying €4,909 (excluding taxes)¹⁵⁹.

ACCES Rhône-Alpes Accompagnement de projet Environnement

This programme provides support to projects which either reduce the environmental footprint of the business or expand the business by developing an eco-product, service or process. Under this remit, projects vary considerably from one another in terms of subject and targeted resources.

The support involves a review of the project proposal by experts from the Chamber of Commerce and Industry or Chamber of Trades and Crafts, followed by personalised consulting tailored to the project¹⁶⁰. Projects will be supported for a maximum of 18 months to ensure their success.

¹⁵⁸ CCI – Lyon website: Environnement: Obtenir la certification ISO 14001, accessed at <http://www.lyon.cci.fr/site/cms/35674/Environnement--Obtenir-la-certification-ISO-14001>

¹⁵⁹ CCI Drome website: Obtenir la certification ISO 14001, accessed at <http://www.drome.cci.fr/sinformer-sur/mon-entreprise-au-quotidien/industrie/plan-pme/iso-14001/>

¹⁶⁰ CCI Drome website: Accompagnement de projet Environnement, accessed at <http://www.drome.cci.fr/sinformer-sur/mon-entreprise-au-quotidien/industrie/plan-pme/accompagnement-de-projet-environnement/>

The programme is estimated to cost €2,100 excluding taxes, however, the costs are covered in full by Rhône-Alpes Region (67%) and consular chamber (CCIT or CMA) (33%)¹⁶¹.

Duration of support

Plan PME is currently running from 2011-2015, allowing SMEs to plan their development and participate in programmes across the range of topics.

Support from the ACCES Rhone-Alpes ISO 14001 programme lasts for 16 months. Support from the ACCES Rhône-Alpes Accompagnement de projet Environnement lasts up to 18 months, although this can vary depending on the type and size of the project.

J.3 Results

Service uptake

More than 1,500 companies from Rhône-Alpes have benefited from Plan PME, as of July 2013¹⁶². Specifically, the initiative has developed the environmental management skills of 15,000 SMEs, mainly in the industry and service sectors.

J.4 Costs

Expenditure

The annual budget from 2011 to 2015 is €15 million (65% financed by the Rhône-Alpes Region). It is estimated that, on average, €10,000 of funding is required per business; therefore, there is sufficient funding to support 1,500 companies¹⁶³.

Sources of funding

Plan PME is largely funded by the Rhône-Alpes Region and the European Regional Development Fund. Depending on the programme, SMEs may be required to contribute, however, the fees are mostly covered.

J.5 Best practice examples

Both of the programmes assessed here provide a bespoke service to SMEs by incorporating and considering their individual situation and needs. The fact that the experts from the

¹⁶¹ CCI Drome website: Accompagnement de projet Environnement, accessed at <http://www.drome.cci.fr/sinformer-sur/mon-entreprise-au-quotidien/industrie/plan-pme/accompagnement-de-projet-environnement/>

¹⁶² Lyon Mag.com: Jacques Attali in Lyon on Monday to start the day dedicated to the “SME Plan Rhône-Alpes, accessed at <http://www.lyonmag.com/article/55244/jacques-attali-a-lyon-lundi-pour-lancer-la-journee-dediee-au-plan-pme-rhone-alpes>

¹⁶³ Semaphores website: I. Presentation of the action, accessed at <http://www.semaphores.fr/observatoire-regions/regions/rhone-alpes/plan-pme-puissante-offre.html>

scheme act as facilitators, rather than advocating specific actions, ensures the business takes full responsibility for the change and there is a lasting impact.

The support which businesses receive is long-term in order to ensure success both in terms of implementing an EMS or specific project. The facility which allows Environmental correspondents to attend thematic days and workshops means that they are able to remain up to date on legislation and technology and have the chance to share best practice among their peers. Workshops and similar events also provide a useful means of collective support.

Whilst it does not appear that the scheme operates alongside other programmes, the Plan PME runs many programmes which cover various topics of relevance and importance to SMEs. This one-stop-shop for businesses should help to reduce confusion on their parts and avoid duplication.

K. CECO2PYME, Spain

K.1 Objectives

This programme provides information, training, tools and advice on the calculation of CO₂ emissions from businesses, particularly SMEs. SMEs can use this tool as a way to improve their competitiveness as the actions to lower CO₂ emissions are often linked to a reduction in costs (e.g. energy costs) which allows the development of other business opportunities. The objective of the programme is to improve the capacity of SMEs in Extremadura to increase their competitiveness and protect the environment which will promote the economic development of Extremadura.¹⁶⁴ The project aims to promote action to reduce greenhouse gases in sectors that are not obliged to under current legislation.¹⁶⁵

K.2 Programme structure and approach

Programme structure

The CECO2PYME project (the calculation of CO₂ emissions as a competitiveness tools for SMEs) was developed by the Fundación Empresa & Clima as part of the 'Green Employment Programme' (Programa Empleaverde) of the Biodiversity Foundation (Fundación Biodiversidad). It is a free service that is co-financed by the European Social Fund.

¹⁶⁴ Ecoticias (2013): **Abordan el cálculo de emisiones de CO2 como herrmienta para pymes extremeñas**, available from <http://www.ecoticias.com/co2/85566/2013/11/11/noticia-medio-ambiente-Abordan-calculo-emisionesCO2-herramienta-pymes-extremenenas>

¹⁶⁵ Fundación Empresa & Clima (2014): **El Cálculo de Emisiones de CO2 como herramienta de competitividad para la Pequeña y Mediana Empresa – Inicio**, available from http://www.empresaclima.org/index.php?option=com_content&task=blogcategory&id=741&Itemid=867

Services provided

The project will: develop a CO₂ emissions calculator for SMEs; create a guide to calculate CO₂ emissions and good practices for reducing CO₂ emissions in SMEs; provide 26 information sessions in different areas and personalised, face-to-face advice for SMEs and micro SMEs, personalised remote support for SMEs and micro SMEs and activities to publicise the programme.¹⁶⁶

The project will:

- Contribute to the development of tools and materials adapted to the reality of SMEs and MicroSMEs to enable them to take stock of their CO₂ emissions and implement measures to reduce them
- Train and help companies address the problems and challenges posed by climate change
- Sensitise SMEs to the opportunities offered by a low carbon economy for economic development that includes social improvements, such as employment generation and simultaneously provide environmental protection
- Provide resources and tools or joint action on economic and environmental aspects of the company to improve competitiveness and increase capacity to generate employment and avoid environmental degradation
- Contribute to compliance with the reduction commitments required by the Spanish State, pushing for reductions in emissions in those sectors not covered by EU legislation (which in Extremadura are particularly relevant as they account for 90.8% of total emissions).

Duration of support

Awareness raising sessions for the project began in November 2013 in various towns in the Spanish region of Extremadura.

Monitoring & evaluation

It is unknown what form monitoring and evaluation of participating companies will take.

K.3 Results

Service uptake

The project began in July 2013 and will run until July 2014. The project is relatively new, therefore there does not appear to be data indicating the level of uptake. The project aimed to include a total of 2,310 companies.

¹⁶⁶ Fundación Empresa & Clima (2014): **El Cálculo de Emisiones de CO₂ como herramienta de competitividad para la Pequeña y Mediana Empresa – Actividades**, available from http://www.empresaclima.org/index.php?option=com_content&task=blogcategory&id=742&Itemid=868

One of the aims of the project was to ensure that 38% of the participants of the project will be located in rural areas, under-populated areas, protected areas and biosphere reserves. Three percent (3%) of participants will come from economic sectors that are linked to the environment.

Economic impacts

No impacts have been identified.

Social impacts

No impacts have been identified.

Environmental impacts

No impacts have been identified.

K.4 Costs

Expenditure

The expenditure associated with the project has not been identified.

Sources of funding

The project has been developed by the Fundación Empresa & Clima and is part of the 'Green Employment Programme' by the Biodiversity Foundation. The project also involves the Chambers of Commerce of Badajoz and Cáceres. Funding is received from the European Social Fund and the 'Green Employment Programme'.

K.5 Best practice examples

No examples of best practice have been identified.

L. IHOBE, Spain

L.1 Objectives

IHOBE is a public agency which is a part of the Department of the Environment and Territorial Policy of the Basque Government. The Eco-Efficiency Programme of Basque Companies (2010-2014) aims to make companies more sustainable, innovative and efficient which, in turn, will make the companies more competitive on the market. The

objectives of the Eco-Efficiency Programme in Basque Companies have been included three pillars of action, one of which is the 'SMEs in Action' (PYMEs en Acción).¹⁶⁷

The main objective of the 'SMEs in Action' programme is to mobilise SMEs and micro-SMEs in the Basque Country and encourage them to implement plans for reducing CO₂ emissions and reducing consumption of material resources. With the help of co-operating bodies and consultants, SMEs are encouraged to save resources, reduce waste and lower emissions of CO₂ by introducing tools specifically adapted to their type of company. The SMEs are able to define their own objectives in order to respond to their needs.

L.2 Programme structure and approach

Programme structure

IHOBE is a public agency which is part of the Basque Government. Within the 'SMEs in Action' programme, the services provided directly by IHOBE are complemented by those of external consultants which are approved by and (at least partially) funded by IHOBE.

Services provided

As part of the Eco-Efficiency Programme, companies have access to many services including:

- Environmental Information Tools
- Training (workshops and expert courses) and direct support (for focusing environmental training needs at companies, via an expert consultant who provides firms with an environmental training plan)
- Tools for supporting business and technology decision-making (including 4 hours free of charge with an expert consultant on legislative and market-related environmental issues) and also access to Ihobe's Environmental Observatory and forums on challenges and opportunities for business
- Tools for Environmental Action, 'Eco-efficient action' is a method specifically designed to be applied by SMEs. It establishes a plan of action focussed on the implementation of simple measures for saving resources and reducing CO₂ emissions. It aims to provide measurable financial and environmental results in the short term, technical assistance from experts approved by Ihobe and 50% of consultancy costs funded by Ihobe
- Tools to support the application of environmental guides and methodologies
- Tools to support recognition.

In the 'SMEs in Action' programme, companies have direct access to an expert and are able to take part in environmental training free of charge. The programme offers companies four hours of free consulting from experts.

¹⁶⁷ Ihobe (nd): **Eco-Efficiency Programme**, available from <http://www.ihobe.net/Paginas/Ficha.aspx?IdMenu=93702a9a-474d-4d25-b4c5-c0dee1fe3283>

Duration of support

The ‘SMEs in Action’ pillar of the Eco-efficiency Program of Basque Companies (2010-2014) is relatively short-term and is estimated to take four months. Noticeable differences have been experienced after a short time period.

Monitoring & evaluation

Companies which wish to take advantage of the services offered by the Eco-Efficiency Programme are required to sign an accession document in which they undertake to:

- carry out at least one environmental improvement action from the list included in the programme for the year
- report the results of the environmental action taken by the company each year;
- disclose or share their experiences with other organisations in the Basque Country.

L.3 Results

Service uptake

The Eco-Efficiency Programme for Basque Companies (2010-2014) has set the following targets for 2014:

Table L1-1: 2014 Targets for the eco-efficiency programme for Basque companies (2010-2014)	
Indicator	Target for 2014
Number of companies participating	1,000
Number of companies involved in eco-design	100
Number of companies with EMAS registration	100
Number of companies implementing cleaner technologies	150
Reduction in GHGs	100,000 tonnes
Amount of waste valorised	100,000 tonnes
Reduction in raw material consumption	200,000 tonnes

Source: Ihobe (2010)¹⁶⁸

In February 2012, it was estimated that some 410 companies had signed up to the Eco-Efficiency Programme for Basque Countries. The ‘SMEs in Action’ programme has significant interest, with almost half of participating companies involved in this pillar of action.¹⁶⁹

¹⁶⁸ Ihobe (2010): **Eco-Efficiency Programme for Basque Companies 2010-2014**, available from <http://www.ihobe.net/Publicaciones/Ficha.aspx?IdMenu=750e07f4-11a4-40da-840c-0590b91bc032&Cod=db229b12-39a8-44f0-a766-c0597be8d62f&Tipo>

¹⁶⁹ Ecoticias (2012): **Más de 400 empresas vascas mejoran su competitividad con acciones ecoeficientes**, available from <http://www.ecoticias.com/sostenibilidad/61672/empresas-vascas-mejoran-competitividad-acciones-ecoeeficientes>

Economic impacts

Cost savings were made by companies as a result of action taken. A number of examples are provided in Table L1-2 below.

Social impacts

No social impacts identified.

Environmental impacts

Examples of the environmental impacts made as a result of recommendations made are provided in Table L1-2 below.

Company	Sector	Action	Environmental results	Investment	Annual savings
Mugape	Surface Coatings	To reduce consumption of tetracholoroethylene	Reduction of 16.34 tonnes of tetrachloroethylene	€0	€14,028.98
Bostlan SA	Aluminium smelters	Reduce the production of dangerous waste	Reduction of 18.54 tonnes	€53,960	€27,443.62
TQ21 Comercial	Chemical industry	Reduce the generation of container waste	Reduction of 7.25 tonnes of dangerous waste from packaging	€3,360	€2,760.69
Packaging Igamo	Storage Solutions	Reduce the consumption of electricity	Reduction of 128.167 kWh less energy	€6,512	€9,089
Kime	Production of commercial equipment	Reduce the consumption of electricity	Reduction of 223,974 kWh less energy	€95,270	€20,805
IkanKronitek	Treatment and covering metals	Reduce consumption of refrigeration water	5,052m ³ less water consumed	€400	€4,849

Source: Ihobe (2011)¹⁷⁰

¹⁷⁰ Ihobe (2011): **Contagiando illusion por la innovación, por el desarrollo sostenible, y por la excelencia**, presentation available from <http://www.slideshare.net/Ihobe/pymes-y-mercados-verdes-programa-ecoeficiencia-ihobe-presentacin-en-copypma>

L.4 Costs

Expenditure

The maximum cost of the service is €2,800 with the possibility of funding for 50% of the consulting costs by Ihobe for those who have signed up to the Eco-Efficiency Programme. Ihobe is a publically owned company and is funded by the Basque Government (Department of Environment). According to the Ihobe website, they have an operating budget of €12.5 million of which all but 6% is funded by the Basque Government.¹⁷¹

Sources of funding

The programme is funded by Ihobe for those companies that have signed up to participate in the programme. SMEs can receive four hours free consulting service. For any other technical consulting advice, it is estimated that the maximum cost of the service to SMEs would be in the region of €2,800, with the possibility of funding for 50% of the consulting costs by Ihobe for those who have signed up to the Eco-Efficiency Programme. Additionally, companies are expected to self-fund the changes recommended.

L.5 Best practice examples

Not identified.

L.6 Potential gains

In October 2013, it was estimated that there were some 610 companies signed up to the Eco-Efficiency Programme. If, as in February 2012, approximately half of those participating were involved in the SMEs in Action programme, it is clear that there is room for further growth of the project and inclusion of additional SMEs.

M. Proyecto Asoclym, Spain

M.1 Objectives

The Asoclym project aimed to improve the profitability and environmental impact of companies in Ceuta. The project aims to show SMEs in the area that sustainability and the fight against climate change can be turned into a business opportunity.¹⁷²

¹⁷¹ Ihobe (nd): **2012 financial information,** available from <http://www.ihobe.net/Paginas/Ficha.aspx?IdMenu=0b52593e-f09f-4719-9a9e-d2689b60b5bb>

¹⁷² Procesa (nd): **Proyecto Asoclym,** available from http://www.procesa.es/index.php?option=com_content&view=category&layout=blog&id=78&Itemid=175

M.2 Programme structure and approach

Programme structure

The Asoclym project is provided by Procesa (the Society for Development of the Autonomous City of Ceuta).

Services provided

The project provides online training courses with a duration of between 50 and 100 hours. The courses cover:

- basic principles of environmental management in SMEs
- the sustainable business – eco-efficiency, renewable energy and opportunities for SMEs
- corporate image, benefits for the company and the development of campaigns;
- design and implementation of energy efficiency plans
- integrated environmental management systems for SMEs.

In addition, the project offers workshops, online documents and a network of SMEs interested in tackling climate change. The project also offers personalised advice and support to the SMEs to incorporate energy saving measures.¹⁷³

Duration of support

The project offers the possibility of long-term support through the network of companies and also the online training courses. Regarding personalised advice and support, it would appear this is a shorter term relationship, with support given at the stage of implementation of the energy saving measures.

M.3 Results

Service uptake

The project will run from February 2012 to January 2013. The project aimed to have some 50 SMEs and 300 people taking part, however, in September 2012, it was noted that 26 SMEs were participating (Ceuta TV, 2012)¹⁷⁴.

Economic impacts

One of the aims of the project was to provide economic savings to SMEs whilst also making them more eco-efficient. The 'Guide to the Eco-Transformation of your SME' provided a number of quantified examples.

¹⁷³ Procesa (nd): **Proyecto Asoclym. Asesoramiento**, available from http://www.procesa.es/index.php?option=com_content&view=article&id=376:asesoramiento&catid=78:proyecto-asoclym-&Itemid=175

¹⁷⁴ Ceuta TV (2012): **Asoclym celebra este lunes sus jornadas sobre cambio climático**, video available from YouTube at <http://www.youtube.com/watch?v=IPHA15rAZIk>

Table M0-1: Examples of economic savings from energy efficiency measures in the Asoclym Project

Type of light bulb	Number of bulbs for 20,000 hours of use	Cost per light bulb	Cost	Cost of electricity	Total cost	Total saving (20,000 hours)
Traditional	20	€0.60	€12	€106	€118	0
Low energy	2	€9	€18	€24	€42	€76

Source: Procesa (nd)¹⁷⁵

Table M0-2: Examples of economic savings from lighting control systems in the Asoclym Project

Control system	Description	Unit cost	Saving
Programmable timer	Timer connected to switches	€45-€90	15%
Timer	Turn of the lights during a determined period	€30	15%
Photoresistor/photocell	Lights come on depending on the level of light	€48-€60	20%
Movement sensors	Lights turn off and on based on the presence of people in the area	€60	20%
Electronic ballast	Stabilises the emission of light	€30-€60	25%-30%

Source: Procesa (nd)¹⁷⁵

Social impacts

No impacts have been identified.

Environmental impacts

The project aimed to reduce the CO₂ emissions of SMEs. One example of a company which took part in the Asoclym project was Ceuta TV. They took the following measures¹⁷⁶:

- changing lights
- using low consuming electrical equipment
- reusing paper
- turning off equipment when it is not in use
- air conditioning on when it is really necessary, at 25°C
- using public transport.

The company noted that eco-efficient actions were also economical for the company, such as using less resources and extending the useful life of items by reusing them (e.g. paper). As a result, the benefits of Ceuta TV taking these measures include a reduction in the emission of CO₂ to the atmosphere by 1,000kg. In addition, Ceuta TV saw a financial improvement by reducing their reliance on petrol, which signifies a notable improvement in their commercial deficit.

¹⁷⁵ Procesa (nd): **Guia Econversiona Tu PYME**, available from <http://www.procesa.es/attachments/article/377/GUIA%20ECONVERSIONA%20TU%20PYME.pdf>

¹⁷⁶ Video of Ceuta TV participation in the Asoclym Project available from YouTube at <http://www.youtube.com/watch?v=7j4psPOHSK0>

M.4 Costs

Expenditure

The Asoclym project had a budget of €125,000. The service is provided free of charge to companies

Sources of funding

The project was co-financed by Procesa and the European Social Fund through the 'Green Employment Programme' (Programa Empleaverde) of the Biodiversity Foundation (Fundación Biodiversidad). Eighty percent (80%) of funding came from the Biodiversity Foundation and the remaining 20% from the City of Ceuta.

M.5 Best practice examples

None identified.

M.6 Potential gains

None identified.

N. SUSTEEN (Spain)

N.1 Objectives

The SUSTEEN project (Sustainable SMEs by means of enterprise Europe network) falls under Principle 9 of the 'Small Business Act' for Europe, which aims to allow SMEs to convert environmental challenges into opportunities.

The project aims at delivering individualised environmental services to SMEs in particular regions belonging to the following priority sectors:

- production and processing of metals
- food industry
- manufacturing of electronic/electric equipment
- waste management
- chemical industry.

The project aims to help SMEs in the above sectors to become more environmentally friendly by:

- increasing awareness of their activity's environmental impacts
- encouraging the adoption of more environmentally-friendly attitudes
- supporting the introduction of environmental value-added services.

N.2 Programme structure and approach

Programme structure

The programme consists of a number of partners, located in the following regions of the EU:

- Provence-Alpes-Côtes d'Azur (France)
- Liguria (Italy)
- Piedmont Region (Italy)
- Transylvania Region (Romania)
- Basque Country (Spain)
- Gothenburg region (Sweden).

Partners consisted largely of local Chambers of Commerce, as well as government and non-governmental bodies. These regional partners established cooperation agreements with regional Environmental Services Providers who provide interested SMEs with free consultancy on environmental issues and free of charge environmental audits. The Environmental Services Providers consisted of consultancies, public research bodies, research clusters, among others.

Services provided

The project provides awareness raising services to promote environmentally friendly behaviour in SMEs and also to raise awareness of the funding opportunities available to them. The core part of the SUSTEEN project is the provision of customised environmental services to SMEs. The SUSTEEN project takes an approach based on the following steps:

- initial information gathering (through a questionnaire)
- workshops and seminars
- environmental/energy audits and visits on the spot (to selected SMEs)
- recommendations.

SMEs contact the local SUSTEEN partner to organise a meeting or telephone call. They can do this either by completing the online questionnaire (which will assess the SMEs level of compliance and commitment to sustainable management and identify opportunities for improvement) or by contacting their local partner directly. SMEs can also request an appointment with an environmental expert to discuss environmental issues and funding opportunities.

Through cooperation agreements with selected regional environmental service providers, partners will be able to provide, free of charge, to SMEs:

- consultancy on environmental and energy efficiency issues
- environmental and energy audits
- definition and proposal of new value-added environmental services.

Duration of support

The project will run for two years, 2012 and 2013. It would appear that the project offers one-off support for selected SMEs.

Monitoring & evaluation

The level of monitoring and evaluation is unknown. It would appear that the project made recommendations but had not yet followed up to see if actions had been taken by SMEs based on the recommendations made.

N.3 Results

From the data available, it does not appear that final results have been published by the project. The book on 'success stories and good practices' highlight the recommendations made by the project to SMEs to become more environmentally friendly.

Service uptake

As part of the initial collection of background information, 280 questionnaires were completed by SMEs in the selected regions. It is unknown how many SMEs in total were selected for dedicated environmental/energy audits. However, in the Basque Country, 80 SMEs were selected for environmental and energy efficiency counselling.¹⁷⁷

Economic impacts

The potential economic impacts from the projects intervention in a number of SMEs are provided in the Table below.

Table N0-1: Examples of potential economic results from the SUSTEEN Programme			
Company	Sector	Recommendation	Potential results
FRAP Italy	Mechanics	Implementation of a closed cooling system for the reuse of cooling water	Saving of approximately €7,500 per year (cost of water treatment for the company)
Insalus Spain	Bottled water	2% reduction in packaging and 2% reduction in internal generation of packaging waste	Annual savings of over €20,000
Halso Fisk Sweden	Food	Introduce new waste plan	Annual saving of €15,000

Source: Susteen (2012-2013)¹⁷⁸

Social impacts

No social impacts have been identified.

¹⁷⁷ Parque Tecnológico (2012): 80 SMEs will receive environmental and energy efficiency counselling through a European programme, available from <http://www.pt-alava.es/?p=652&lang=en>

¹⁷⁸ Susteen (2012-2013): **Booklet of success stories and good practices 2012-2013**, available from <http://www.susteen.eu/index.php/download/66-success-stories>

Environmental impacts

There are no data concerning the overall environmental impact of the project. However, the potential results of a number of interventions are presented in the Table below.

Table N0-2: Examples of potential environmental results from the SUSTEEN Programme			
Company	Sector	Recommendation	Potential results
ESI Italy	Natural supplements	Replacement of window frames	Annual energy savings in the region of 25,000 kW
Mundi RISO Italy	Agro-food	Replace electric motors with high efficiency motors	Energy consumption reduced by up to 10%

Source: Susteen (2012-2013)¹⁷⁸

N.4 Costs

Expenditure

The service is offered free of charge to qualifying SMEs.

Sources of funding

The project is co-funded by the European Commission within the Enterprise Europe Network (EEN) initiative.

N.5 Best practice examples

The SUSTEEN project has published a book of ‘success stories and good practices’. At the core of the project was the ability to provide personalised direct intervention to SMEs by local partners and local environmental services providers.

N.6 Potential gains

The small geographic nature, and limited range of sectors included in the project suggest that, if the project is successful it could be rolled out in other areas. This would allow the inclusion of a larger number of SMEs to participate in the scheme and benefit from the services offered.

O. Giada Project, Italy

O.1 Objectives

The GIADA project (integrated environmental management in the tannery district of Chiampo Valley) was aimed at the tanning industry of the Chiampo Valley which consisted

of approximately 800 companies which manufactured bovine and calf leathers and were also involved in the furnishing, shoe and clothing industries.

The project aimed to improve the environmental impact of the tannery district of the Chiampo Valley. The project aimed to:

- reduce air, water and soil pollution as a consequence of technological and innovations being implemented by local businesses
- improve environmental protection in the territory, through the Agency set up
- citizens' participation in defining environmental policies
- contribute to economic growth and life quality improvement.

To achieve these goals, the project aimed to implement an environmental management approach bringing together all interested parties, foster the continuous improvement of industrial production and contribute to environmentally friendly policies integrated into the whole industrial production cycle.

O.2 Programme structure and approach

Programme structure

The GIADA Project was run by 16 municipalities in the Chiampo Valley area of Italy. Partners of the project included the Veneto Environment Agency (ARPAV), the Veneto Region, and industry and SME associations: the Industrialists Association of the Vicenza Province, the Artisans Association of Vicenza, SME Association of Vicenza Province, the National Confederation for the Craft Sector, and the Small and Medium-Enterprise Association for the Province of Vicenza, the Veneto Region (EC, nd).¹⁷⁹

Services provided

The project provided training and communication activities for entrepreneurs in the tanning sectors, public administration employees and students, and the implementation of a website aimed at providing information and contacting stakeholders.

The project oversaw the creation of the Giada Agency – a District Office for the Environment. The Giada Agency acted as a single interlocutor for companies and citizens in the field of environmental protection. For SMEs, the Giada Agency provided a number of services including help in carrying out the preparatory actions aimed at the adoption of an EMS by SMEs. SMEs also received additional help and documentation if they were willing to achieve an ISO or EMAS certification. Also:

- for SMEs willing to implement an Environmental Management System, the Agency provided the district environmental review and other useful information on environmental issues

¹⁷⁹ EC (nd): Case 17: Giada Project, Italy, available from http://ec.europa.eu/environment/sme/pdf/giada_en.pdf

- the Agency also provided help in the application of some environmental legal requirements e.g. the Solvents Directive.

Duration of support

The Giada Project was originally in place from 2001 to 2004 and the Giada Agency was initially set to run from 2004 to 2009, however, the agency continued to function after this time and was funded by local authorities.

O.3 Results

Service uptake

The project targeted those companies involved in the tanning industry in the Chiampo Valley. An estimated 800 companies are involved in this sector and more than 90% (i.e. 700-750) were SMEs.

Economic impacts

No economic impacts have been identified.

Social impacts

No social impacts have been identified.

Environmental impacts

Solvent Consumption

A study in 2004 revealed that the quantity of solvents used has been reduced by 45% (18,000 tonnes in 1996 to 9,500 in 2004). The factor of emissions was reduced by one third.

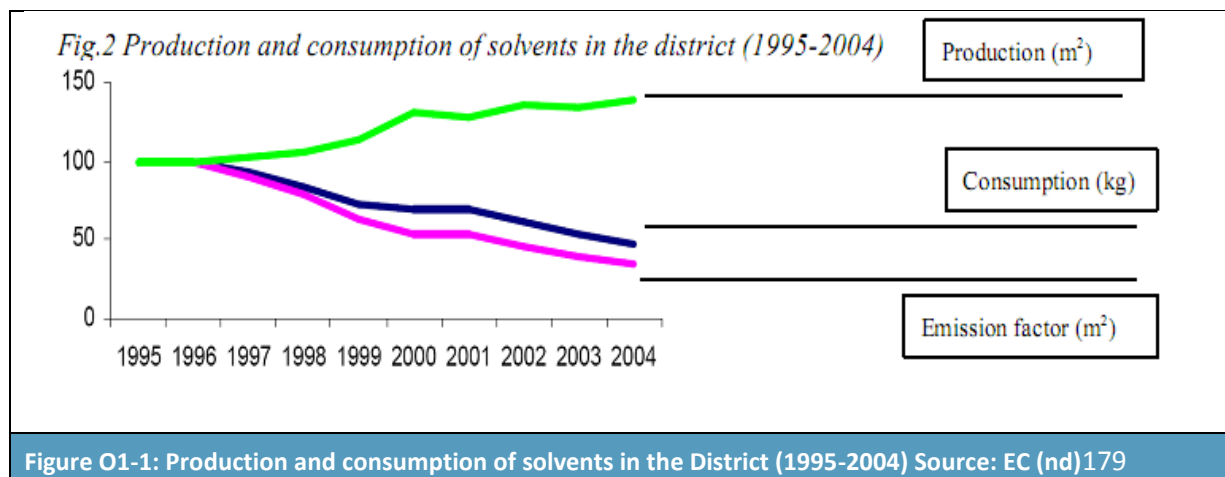


Table O1-2: Reduction in solvents consumption			
Year	Solvents consumption (kg)	Emission factor (g/m ²)	Leather production (m ²)
1996	18,473,000	148	124,516,000
1997	17,128,000	134	128,145,000
1998	15,295,000	115	132,856,000
1999	13,489,000	94	142,870,000
2000	12,852,000	78	165,221,000
2001	12,758,000	79	160,766,000
2002	11,487,000	67	170,983,000
2003	9,751,000	58	167,902,000
2004	8,795,000	50	174,391,000

Source: EC (nd)

Wastewater

In addition, the quality of treated waste water has improved. Between 2000 and 2002, it was noted that the level of chlorides has been decreasing, bacteric load has diminished and the quality of the Acquetta River has improved.

O.4 Costs

Expenditure

The project had an initial budget of €1,505,000 of which €1,280,000 was funded by the LIFE programme (2001-2004). The actual cost however was slightly lower at €1,323,000.

Sources of funding

The project was funded by the LIFE project. Additional funding was provided by the Province of Vicenza (51%) and the participating municipalities (to varying degrees).

The initial funding of the initiative was provided by the LIFE project, which covered the high costs for the implementation phase. However, the project continued when the funding from the LIFE project ceased, with on-going costs funded by local authorities with no external funding.

O.5 Best practice examples

The development of the initiative exceeded expectations. In particular, the collaboration of a number of municipalities was a success and they created a solid agreement. The municipalities shared most of the ambitions and objectives of the project and collaborated in a constructive manner, showing a high level of involvement.

O.6 Potential gains

The project has continued beyond its original time frame, using funding from local authorities rather than external sources. A similar project has also been rolled out in other areas of Italy.

P. Eco-Efficiency Scan, Belgium

P.1 Objectives

The Eco-Efficiency Scan programme was created in 2006. The aim of the programme was to identify the opportunities to improve the eco-efficiency of businesses. It also aimed to encourage SMEs to invest in eco-efficient policies in order to combine environmental profit with economic advantage. It analysed, for example, if more materials could be recycled, and if energy and water consumption and volume of waste could be reduced. The analysis was conducted by an experienced consultant (and was financed by OVAM (Public Waste Agency of Flanders)).

P.2 Programme structure and approach

Programme structure

The eco-efficiency scan programme allowed SMEs to identify their main environmental impacts and to improve their level of eco-efficiency. The programme was provided by OVAM and was available in Dutch to businesses with less than 250 employees. The scan is provided to SMEs in the Flanders region, free of charge (funded by OVAM). It should be mentioned that the scan is not a compliance audit, which means that the company will not be tested on their environmental compliance.

Services provided

In the first stage of the eco-efficiency scan (essentially an audit), information is collected on a total of 35 eco-efficiency points covering the so-called 'modules':

- the process (prevention of waste, use of energy and transport etc.)
- the products
- markets (distribution chain, green marketing etc.)
- value (optimising the sorting of waste)
- management (monitoring, internal communications etc.).

The five modules consist of several sub-sections and, because of this, it is possible to assess those sections that are relevant for the specific company rather than conducting the whole scan.

The scan can be broadly divided into the seven following steps:

- Preparation screen/check
- Conduct the screen/check
- Development of the results and of the concept report
- Preparation discussion concept report
- Discussion concept report
- Final report
- After care/evaluation

The business is then visited by a consultant who spends 3 hours discussing with management and 1 hour conducting a site visit. Following this, the consultant prepares a report for the business which covers all of the 35 points. For each of the 35 aspects, the report considers the relevance of the aspect for the particular business (e.g. the cost of energy in relation to the total business costs) and the likelihood of improvement (based on the experience of the consultant).

Duration of support

The eco-efficiency scan/audit itself took 2 days, however, the time taken to put in place the recommended measures varied. The companies that took part in the scan were contacted after six months and another audit was conducted after twelve months.

Monitoring & evaluation

Following the initial audit and submission of the report, SMEs were contacted after six months to monitor developments and to ensure that practices were sustained. A further audit was conducted after 12 months.

P.4 Results

Service uptake

Over three (2006-2010) years, 1,000 Flemish SMEs used this programme. The programme appears to have been a success with 92% of participating companies taking action following the scan. During the first year of the scan alone, 330 companies participated.

In a review of the programme¹⁸⁰ after one year, the participating companies were asked three questions and results are presented in the table below.

Table P1-5: Review of the eco-efficiency programme (after year one)		
Question	Answer	Percentage of responses
1. What is your general impression of the eco-efficiency-scan?	Somewhat valuable	13%
	Valuable	61%
	Very valuable	26%
2. What did you think of the services of the consultant?	Sufficient	3%
	Good	43%

¹⁸⁰ OVAM (2008): Evaluatie van het Eco-efficiëntiescan programma. 1ste jaar. [evaluation of the eco-efficiency scan programme. 1st year].

Table P1-5: Review of the eco-efficiency programme (after year one)		
Question	Answer	Percentage of responses
	Very good/ excellent	54%
3. Did opportunities arise from the scan that you want to continue?	No	4%
	Maybe	13%
	Yes	83%
Source: OVAM (2008) ¹⁸⁰		

Economic impacts

One example of the success of the Eco-Efficiency scan programme is that of the company BDMO, which manufactures packaging solutions. Following the scan, the company liaised with employees on ways to cut energy use. By reducing lights in the offices by a quarter (mainly by removing those close to windows) the company has saved more than €2,000 per year, with peak power usage reduced from 290kW to 265kW. In addition, BDMO also introduced a waste awareness campaign within the company in which awareness was raised amongst employees and the number of waste collection rounds was reduced from twice weekly to once every two weeks (reducing the transport of waste by 75%). The volume of waste has reduced and the waste produced is now sorted, with some (e.g. cans) sold for recycling. It is estimated that BDMO save €52,300 per year by sorting waste and in the changing of waste collection practices for the company.

Social impacts

No social impacts identified.

Environmental impacts

The action taken by participating companies resulted in, on average, energy reduction of 8% and a 4% reduction of water consumption. The amount of waste produced by the participating companies remained the same in spite of production revenue increasing.¹⁸¹

P.4 Costs

Expenditure

The Eco-Efficiency Programme had a budget of €2.6million. It is estimated that the average investment cost to implement the recommendations of the Eco-Efficiency scan is in the region of €62,780.¹⁸²

¹⁸¹ MVO Vlaanderen (nd): **De OVAM gaat online et de eco-effiëntiescan**, available from <http://www.mvovlaanderen.be/kenniscentrum/link/de-ovam-gaat-online-met-eco-efficientiescan/s/hr-bureaus/t/energie/>

¹⁸² HLN.be (2009): **Kmo's kunnen eco-effiëntie verboden via internet**, available from <http://www.hln.be/hln/nl/2657/ECotips/article/detail/1035567/2009/11/30/Kmo-s-kunnen-eco-effiëntie-verbeteren-via-internet.dhtml>

Sources of funding

The programme was funded by OVAM – the service was offered completely free of charge to SMEs. However, investment in the possible eco-efficiency measures was funded by the SMEs.¹⁸³

P.5 Best practice examples

It was considered crucial to follow up on the participating companies after the initial audit. This was done after six and twelve months to ensure that changes had been made and importantly were being sustained.

P.6 Potential gains

According to CORDIS, there are some 592,000 companies in Flanders¹⁸⁴, of which 99% are estimated to be SMEs¹⁸⁵. Consequently, it can be deduced that the Eco-Efficiency scan programme has further potential for growth.

In 2011, OVAM also introduced the MAMBO system – an online calculator to estimate the costs associated with waste for businesses. MAMBO aims to increase the understanding of businesses of the cost of waste to their company and, ultimately, to encourage the costs associated with waste.

Q. Premio Grants

Q.1 Objectives

In October 2012, the Walloon Government launched the ‘Premio Grants’ programme. This is a support mechanism for consultancy and eco-management, enabling SMEs to have recourse to skills in different areas. The grant specifically covers non-technological innovation based on eco-management and aims to encourage SMEs to make use of specialist consultants in this field in order to integrate economic, social and environmental criteria into the internal processes of the company.

¹⁸³ Select Committee on Science and Technology (2008): **Appendix 6: Visit to Belgium**, available from <http://www.publications.parliament.uk/pa/ld200708/ldselect/ldscitech/163/16317.htm>

¹⁸⁴ CORDIS (2012): **Regional Research & Innovation Service – Flanders**, available from http://cordis.europa.eu/flanders/intro_en.html

¹⁸⁵ Eurofound (2013): **Restructuring in SMEs: Belgium**, available from www.eurofound.europa.eu/pubdocs/2012/4718/en/1/EF124718EN.pdf

Q.2 Programme structure and approach

Programme structure

The grants are provided by the Walloon Government.

Services provided

The grant will cover the cost of consultancy fees for SMEs to achieve a number of objectives including:

- the management of energy consumption, waste management, consumption of water
- lighting usage and use of IT
- the optimisation of travel and transport of goods and people
- a tool to track invoices relating to waste management and quantity control;
- staff mobility surveys
- the implementation of new working structures e.g. tele-commuting and video conferencing.

Duration of support

The grants provide one-off support for SMEs to achieve a specific goal. The duration of the support will last no longer than 12 months.

Monitoring & evaluation

It is unknown how the grants have been monitored or evaluated.

Q.3 Results

Service uptake

It is unknown how many SMEs have made use of the grants.

Economic impacts

No economic impacts have been identified.

Social impacts

No social impacts have been identified.

Environmental impacts

No environmental impacts have been identified.

Q.4 Costs

Expenditure

The Walloon Government will provide 75% of the cost of consultancy fees for consultants carrying out services in the field of non-technological innovation. The consultant must be certified in Wallonia and the SME must be resident in Wallonia.

The grant will subsidise 75% of the cost of the consultant, capped at €620 per day (excluding VAT) and reaching a maximum of €20,800 per application.

Sources of funding

The grants are provided by the Walloon Government.

Q.5 Best practice examples

No best practice examples have been identified.

R. Union Wallonne des Entreprises - Environmental Consultants, Belgium

R.1 Objectives

The 'Cellule des Conseillers en Environnement' (CCE) (team of environmental advisors), which is part of the Union Wallonne des Entreprises (Walloon Business Union), informs businesses in Walloon of the environmental regulations and helps them to integrate the environment into their daily business. The programme was established initially in 1994 and has since been renewed annually.

R.2 Programme structure and approach

Programme structure

The team of environmental advisors of the Union of Walloon enterprises offer SMEs free services which aim to assist in the overall improvement of the environmental performance of the company. In particular, the team of advisors describes its objectives as¹⁸⁶:

- informing Walloon enterprises on environmental regulation and the need for pollution prevention
- raising the level of awareness of Walloon enterprises with respect to environmental management and assist them in this field.

¹⁸⁶ Case 15: Team of Environmental Advisors, Belgium available from http://ec.europa.eu/environment/sme/cases/cases15_en.htm

Services provided

The group provide 'eco-diagnostics' services which are free of charge and confidential. They have significant knowledge and provide tools that are completely adapted to the individual company. More specifically, the eco-diagnostic service provided to SMEs includes:

- conducting an initial assessment of the environmental situation and performance of the SME through a standardised audit method
- the provision of a recommendation report.

Additionally, they are also able to provide:

- personalised help with environmental permits
- practical tools
- information sessions
- a helpdesk – mail or telephone.

Duration of support

The project offers on-going support in the form of assistance in recognising opportunities and the development of recommendations for improvements.

The environmental audits take the form of two half days spent on site by a UWE environmental advisor who then draws up a report. In total, the team spend a maximum of five working days providing advice to a company.

Monitoring & evaluation

It is unknown what form of monitoring and evaluation is undertaken by CCE or the Union of Walloon Enterprises.

R.3 Results

Service uptake

The service appears to be relatively well used with more than 800 audits undertaken since 1994. Additionally, the services offered by CCE in the form of a helpdesk etc. are also used significantly by companies.

Since 1994, more than 800 environmental audits have been carried out, mainly in SMEs, resulting in 16,000 recommendations (an average of 20 per company). It is estimated that around 60% of the recommendations are adopted.

- The number of general 'eco-audits' has decreased as the initial target group has diminished
- Common tools to inform about legislation:
 - Internet sites (2) with an average of 4,000 visits per month

- Help desk answered 556 questions in 2005
- Monthly e-newsletter to 2,000 subscribers
- 20 seminars run in 2005 and attended by 1,129 people
- 59 companies have made investments, averaging €210,000 each
- EMS have been implemented in 32 companies
- 100 companies have obtained an environmental permit

Economic impacts

No economic impacts have been identified.

Social impacts

No social impacts have been identified.

Environmental impacts

No environmental impacts have been identified.

R.4 Costs

Expenditure

In 2006, the project had a budget of €500,000 per year.

Sources of funding

The activities of the team are funded by the Walloon Regional Government.

SMEs have to contribute a small fee for the eco-diagnostics service; €200 to ensure their commitment and ownership to the initiative. It is estimated that this is only 10% of the overall value of the service provided.

R.5 Best practice examples

The environmental auditing conducted by the CCE has been recognised by the European Commission as one of the best examples of support programmes for SMEs with regard to the environment.

According to the case study on the programme, UWE has identified the main strengths of the environmental advisory team as:

- direct contact with target companies
- management of the programme by a federation which represents the companies
- input from officers at the environment department of the Walloon Government.

Additionally, the Walloon Region claims that the main strengths of the programme are:

- the UWE acts as an interface between companies and public administration
- SMEs have confidence in UWE
- the development of waste prevention plans.

R.6 Potential gains

The CCE is an on-going project, meaning there is always the potential for SMEs to benefit from its offerings. Additionally, as the CCE becomes more knowledgeable and as its objectives change, SMEs can return to the service for additional help and support.

S. Programme 1: Ökomanagement Niederösterreich [Eco management Lower Austria] (AT)

S.1 Objectives

The purpose of the Eco management programme in Austria can be described as direct hands-on support to improve the respective company's production efficiency. In order to become more sustainable, an advisor will be assigned to the company who will conduct onsite visits and give concrete advice.

S.2 Programme structure and approach

Programme structure

The Eco management programme constitutes advisory, face-to-face support from an assigned advisor who will offer support to the respective company for a maximum of ten consultation days. This is subsidised with 50%. It has been described that "in cooperation with advisors, possible measures are being planned, implemented in a pre-defined time-frame, and controlled as part of the check-up advice."

Services provided

Ten sessions of advice, which are subsidised by 50%, are provided by a specifically assigned advisor. Additionally, check-ups are carried out with the implementation of all new measures and the initiative offers some follow-up support.

Duration of support

This will be limited to ten sessions initially, with an assessment of the implemented measures and consultation for additional measures to be carried out over a further one to two days. This is the pre-requisite for the Eco management NÖ [NÖ stands for Lower Austria] award, but is subsidised by 100%. It should be noted that the company can apply for a check-up assessment without having had to participate in the consulting service of ten sessions.

S.3 Results

Service uptake

It is difficult to estimate uptake as the Eco management program has already been in operation for some time and it not only supports SMEs in becoming more efficient, but also cities and towns. Additionally, each participant can apply multiple times for the support.

Economic impacts

The economic impacts are dependent on the project. Some examples include:

- 1.) The city of Neulench took part in the consultation advice and, with the development of a district heating system, could save around 2000 tonnes of CO₂ equalling 800.000 litres of oil for heating.
- 2.) The town of Schwarzenau built a new energy efficient cabin building for their sports facilities and, with this change, saves approximately 2.800 kg of pellets for the heating and, with the installation of a rainwater cistern, saves approximately 4500 m³ of water.
- 3.) To give an example of a company, Vöslauer Mineralwasser AG [a manufacturer of mineral water] has implemented several efficiency measures. One example is the increased delivery of their products by train, from 25 to 28%, which has seen a reduction in CO₂ emissions of an estimated 60 tonnes per year.

Further to this, the company increased its usage of recycled materials for their PET bottles from 24% to 45% (between 2009 and 2012), in effect, reducing its carbon emissions by approximately 102g of CO₂ per bottle.

The optimisation of equipment used in the washing and filling process led to a reduction in water usage of 2%, equating to approximately 2,7l per bottle.

Social impacts

The social impacts are difficult to estimate as they are dependent on the project.

Environmental impacts

The environmental impacts are difficult to estimate as they are dependent on the project.

S.4 Costs

Expenditure

The level of expenditure is dependent on the project.

Sources of funding

The provincial Government of Lower Austria provides the funding for the subsidy of the consultation sessions.

T. Programme EffNet Rheinland-Pfalz [Rhineland-Palatinate] DE

T.1 Objectives

The Efficiency Network programme (EffNet) began implementation in 2006 and is aimed at all companies based in the federal state of Rhineland-Palatinate. It is described as a “central, multidisciplinary and non-commercial information and advisory platform as well as a link between the various individual initiatives in the state of Rhineland-Palatinate to comprehensive information, advice and guidance on the subjects of resource efficiency, energy and the environment.”

T.2 Programme structure and approach

Programme structure

The EffNet programme is described as a central, interdisciplinary and non-commercial information and consultation platform, targeted at all companies in Rhineland-Palatinate, but focusing mostly on SMEs. It provides companies with a platform to search for information on particular topics, as well as providing a resource for consultancy-related contact details.

It has been noted that in the framework of the EffNet, projects on product integrated environmental protection (PIUS) and resource consumption (raw materials and utilities), are being implemented in SMEs.

Services provided

Companies are able to search for a specific advisor who is not directly provided by the EffNet. However, within a specific topic of interest, a company can find the appropriate advisor from the local, or relevant region via 4 drop-down lists.

Under the labelling “EffCheck [Efficiency Check] – PIUS Analysis in Rhineland-Palatinate” around 30 companies per year – in particular SMEs – are given the option to have their manufacturing assessed by an advisor with a view to facilitating cost savings. In September 2013, it was announced that the EffCheck (which includes the PIUS-check) had been conducted at the ‘Chemotechnischen Abpack-Service GmbH (CAS)’.

In relation to EffCheck, a percentage of the costs incurred by SMEs are covered by the federal state, including up to 70% of the consultation fees, to a maximum sum of €4.800. Larger companies can also participate, but this would be without the financial aid of the federal state.

Duration of support

The duration of support is dependent on the project.

T.3 Results

Service uptake

As of April 2013, 69 businesses in Rhineland-Palatinate had successfully completed an EffCheck and are expected to save up to €3 million per year¹⁸⁷.

It is anticipated that 30 EffChecks will be carried out in companies each year¹⁸⁸.

Economic impacts

So far, EffCheck projects have been completed in 80 companies. Results achieved as of October 2013 are shown in Table T1-1.

Cost savings per year (€)	Annual CO ₂ savings (tonnes)	One-time investment (€)	Amortisation (years)
5,869,507	20,810	17,114,171	2.9

In a Presentation given in April 2011, the results of 34 completed EffChecks were presented, Table 1-2.

¹⁸⁷ Hochschule Trier website: Projekt “EffCheck – PIUS-Analysen in Rheinland-Pfalz”, accessed at [http://www.hochschule-trier.de/index.php?id=411&no_cache=1&L=1&tx_ttnews\[pointer\]=9&tx_ttnews\[tt_news\]=8338&tx_ttnews\[backPid\]=4783&cHash=d57fdd64dfac29a51ee1f7aa2442abb3](http://www.hochschule-trier.de/index.php?id=411&no_cache=1&L=1&tx_ttnews[pointer]=9&tx_ttnews[tt_news]=8338&tx_ttnews[backPid]=4783&cHash=d57fdd64dfac29a51ee1f7aa2442abb3)

¹⁸⁸ Press Relation website: Leuchtturmprojekte stehen für Energieeffizienz im Unternehmen, accessed at http://www.pressrelations.de/NEW/standard/result_main.cfm?pfach=1&n_firmanr=106595&sektor=pm&detail=1&r=378301&sid=&aktion=jour_pm&quelle=0

¹⁸⁹ EffNet website: Ergebnisse der EffChecks, accessed at <http://www.effnet.rlp.de/Projekte/EffNet-Projekte/EffCheck-PIUS-Analysen-in-Rheinland-Pfalz/EffCheck-Ergebnisse/>

Table T1-2: Potential savings from EffChecks completed from launch of programme (2006) to April 2011¹⁹⁰

Savings	Per farm	Total
Annual costs savings (€)	42,000	1,430,000
Annual CO2 savings (tonnes)	240	8,200
Investment required (€)	188,000	6,400,000
Amortisation (years)	4.5	4.5

Social impacts

The social impacts are difficult to estimate as they are dependent on the project.

Environmental impacts

One example of a wine yard that took part in the EffCheck is shown in table T1-3.¹⁹¹

Table T1-3: Savings potential, calculated during the EffCheck, for the wine yard 'Schweickardt'

Measure	Investment in €	Cost savings in €/a	Amortisation
Reconstruction of cold room	13.750	1.400	7 years
Modification of electric lighting	910	250	3,9 years
Modification of circulation pump	360	120	3 years
Installation of PV-system	15.000	1.625	10 years

The reconstruction of the cold room does not only save on costs, but also 6,5 tonnes of CO₂ annually.

T.4 Costs

Expenditure

The costs for the EffCheck alone are listed in table T1-4 below.

Table T1-4: Expenditure on the EffCheck of the federal state and amount of companies for the year 2007 until 2011¹⁹²

Year	2007	2008	2009	2010	2011 (until and incl. Oct. 2011)
Share of the costs that has been covered by the federal state (net)	€9000	€35.665	€40.180	€53.827	€44.700
Number of EffChecks	2	8	9	12	10

¹⁹⁰ Landesamt Für Umwelt, Wasserwirtschaft und Gewerbeaufsicht (2011): Der EffCheck – PIUS-Analysen in Rheinland-Pfalz (presentation), accessed at

http://www.stoffstrom.org/fileadmin/userdaten/dokumente/Veranstaltungen/PIUS/PIUS11/2_PIUS_Bertsch_EffCheck_Laptop.pdf

¹⁹¹ EffNet (2012): Weingut Schweickardt, Produktionsintegrierter Umweltschutz im Weingut, information downloaded from <http://www.effnet.rlp.de/Projekte/binarywriterservlet?imgUid=d280e843-57e7-a313-5d27-1a50defa5a20&uBasVariant=11111111-1111-1111-1111-111111111111>

¹⁹² Landtag Rheinland-Pfalz (2011): Kleine Anfrage [small enquiry], information downloaded from <http://www.landtag.rlp.de/landtag/drucksachen/605-16.pdf>

Sources of funding

The EffCheck is funded by the state budget (Chapter 08 16, title 526 08) of the Federal State of Rhineland-Palatinate.¹⁹³

U. Programme Umweltpakt Bayern [Environmental Pact Bavaria] DE

U.1 Objectives

The Environmental Pact Bavaria was a voluntary agreement between the state and the economy, concerned with the goal of sustainable growth. It was concluded in 1995.

U.12 Programme structure and approach

Programme structure

The voluntary agreement centred on the key topics of:

- Climate and energy
- Energy-efficient building and renovation
- Energy-efficiency in production processes
- Alternative drive/power train technologies and electro-mobility
- Environmental technology
- Integrated product policy (IPP) and resource-efficiency
- Management systems

Services provided

The agreement dictates that participants of the Environment Pact will deliver one or multiple environmental protection measures that range from the introduction or the extension of an environmental management system or energy management system. The programme webpage provides information, guidance and employee tips, which can be downloaded as posters. Via the website of the Ministry responsible for the Umweltpakt, the interested company can acquire help to become certified for the Eco Management and Audit Scheme. This means that the company that has been successfully certified can not only receive assistance with the facilitation of the administrative process, but actual fee reductions also.

This could amount to a 30% fee reduction for emission control licensing, 50% reduction of water use charges and a 50% reduction of waste disposal fees.

¹⁹³ Ibid.

Another service offered as part of the Umweltpakt is the 'Bavarian Environmental consulting and audit program' (BUBAP) [Bayerischen Umweltberatungs- und Auditprogramm (BUBAP)]. The consultation is conducted by an external advisor who will focus on the following key areas:

- Inventory of operational environmental impacts, the environmental organization as well as the environmental requirements applicable to the operation
- Vulnerability analysis and suggestions for the continuous improvement of environmental protection, especially for those measures that go beyond the legal requirements and help companies to implement integrated environmental protection
- Cost estimate for the proposed measures and demonstration of funding, if necessary, taking account of public funding.

Per consulting day (8 hours), an amount of 600 € could be subsidised. A total of up to 3 days are eligible. If at a lower daily fee, the subsidy per consulting day would be 50% but must not exceed a total of 900 €.

Also, the participants of the Umweltpakt Bayern can be found via the Umweltpakt Bayern app, which can be downloaded from the website of the Bavarian Ministry for Environmental and Consumer Protection [Bayrisches Staatsministerium für Umwelt und Verbraucherschutz].

Duration of support

Although the Environment Pact was concluded in 1995, it has been renewed 3 times since then and is still ongoing.

U.3 Results

Service uptake

In a mid-term review of 2013, it is said that as of April of the same year, 3,851 enterprises with 630,513 employees were members of the pact. Most global companies, such as the Allianz, Audi, BMW, Siemens or the Wacker Chemie, are part of the agreement, but most participants are SMEs or craft enterprises.

By 2013, 120 projects (44%) had been successfully implemented, and 150 projects (55%) were still ongoing. In the case of 4 projects (1%) the implementation was not possible.

Economic impacts

The economic impact depends on the project, but an example taken from the mid-term report of 2013¹⁹⁴ is outlined below.

The company, Huber SE from Berching, developed a solution [the ThermWin®-process] in order to increase energy and resource efficiency by using the warmth from waste water (confirmation No. 207). This means that, in the year 2010, the company started to operate the first commercial-scale plant in Bavaria to use the heat from wastewater. This plant could cover 65% of the heat-demand of 102 households, resulting in a potential annual CO₂ reduction of approximately 70 tonnes. The company won the Energy Price Award 2012 for the development of the process.

Social impacts

The social impacts are dependent on the project.

Environmental impacts

The environmental impacts are dependent on the project, but an example is provided in the case of the company Huber SE, which managed to save approximately 70 tonnes of CO₂ annually as a result of their effort to utilise the heat of waste water.

U.4 Costs

Expenditure

Expenditure information is not available on the general website of the Umweltpakt or in the mid-term report. It is likely to depend on the respective project and whether the company applied for subsidies on the cost of implementing an EMAS or the consulting and audit (BUBAP) programme.

Sources of funding

The fee reduction as a result of the successful implementation of an EMAS is financed by the Bavarian State Government [Bayerischen Staatsregierung].

The Bayerisches Umweltberatungs und Auditprogramm (BUBAP) is also financed by the Bavarian [Federal] State.

¹⁹⁴ Bayerisches Staatsministerium für Umwelt und Verbraucherschutz (): Umweltpakt Bayern 2010 – 2015, Halzeitbilanz 2013 [Environment Pact Bavaria 2010 – 2015, Halftime balance], information downloaded from http://www.bestellen.bayern.de/application/stmug_app000009?SID=1931415517&ACTIONxSESSxSHOWPIC%28BILDxKEY:stmug_umwelt_00010,BILDxCLASS:Artikel,BILDxTYPE:PDF%29

U.5 Best practice examples

The participants of the Umweltpakt Bayern met on a regular basis at so-called 'work forums', in which future development and goals will be discussed. The goal of the forum has been described as the assessment, formulation and implementation of propositions to the topics of Integrated Product Policy (IPP) and resource efficiency. In a forum meeting of 14.7.2011, the participants agreed to double the material and resource efficiency (of 1994 levels) by 2020.

In order to strengthen the regionalisation, it has been agreed that, in the administrative districts, 'regional working groups Umweltpakt Bayern' composed of representatives of the district councils and regional trade associations, would be established.

V. Programme Energiecentrum (NL)

V.1 Objectives

The Energiecentrum programme was established by the Royal Metal Union as the follow-up initiative from the Energiecentrum MKB, in order to utilise the existing information on how to save energy, reduce CO₂ emissions and operational costs. This provides online tools, such as a compressed air check, in order to detect leakages of the compressed air devices.

V.2 Programme structure and approach

Programme structure

On the website of the Energiecentrum programme, the interested company can find information on several aspects of energy saving, as well as energy generation (e.g. converting a waste product into bio-energy). The energy savings tips that are provided focus on certain types of energy usage, such as electric lighting, cooling and ventilation, heating and compressed air.

Services provided

Information and direct savings advice are provided, along with certain topics explained in the previous section. In relation to energy generation, the web resource provides information on bio energy, wind energy, solar energy and water power. Interested companies can also view project examples and acquire information on subsidies.

However, companies interested in Energy saving can contact the Energiecentrum programme for a site visit in order to identify any potential savings. It is unclear if the attending 'advisors' are provided directly by the Energiecentrum programme, however it states that, through the vast network of the Energiecentrum, the right advisor will be found, depending on the issue and the specific sector of that company. Any visit would then be followed by recommendations and information on subsidies (if applicable).

Duration of support

The duration of support can vary between companies depending on their needs and the project.

V.3 Results

Service uptake

In 2009, more than 200,000 SMES entrepreneurs received services from the Energie Centrum MKB, resulting in energy savings of €25 million¹⁹⁵.

Economic impacts

Case study

A pharmacy in Amsterdam installed an automatic door instead of having an open store front following an audit and experienced a 42% reduction for their gas bill¹⁹⁶.

Social impacts

The social impacts are dependent on the project.

Environmental impacts

The environmental impacts are dependent on the project.

V.4 Costs

Expenditure

The level of expenditure is unclear as the programme was established by the trade organisation, the Royal Metal Union.

W. Programme MIA (milieu-investeringsaftrek) and Vamil (willekeurige afschrijving milieu-investeringen) NL

W.1 Objectives

The purpose of MIA (environment investment rebate) and Vamil (arbitrary depreciation of environmental investments) is to encourage companies, and SMEs in particular, to

¹⁹⁵ Energie Centrum website: Energiecentrum MKB helpt zoeken naar het 'nieuwe peertje', accessed at <http://www.energiecentrum.nl/bespaar-en-verdien-groot-succes/energiecentrum-mkb-helpt-zoeken-naar-het-a-nieuwe-peertje/>

¹⁹⁶ Energie Centrum website: Klanten waarderen gesloten winkelpui DA Drogist, accessed at <http://www.energiecentrum.nl/Klanten-waarderen-gesloten-winkelpui/>

implement sustainable or environmentally friendly technology or production methods. The goal of these two different schemes has been described as investing in environmentally friendly products or company resources with a fiscal advantage; bringing innovative environmentally-friendly products onto the market more quickly.

W.2 Programme structure and approach

Programme structure

Through the MIA, 36% of the investment costs for an environmentally friendly investment can be deducted from the fiscal profit on regular depreciation. Via Vamil, the party can decide when to write off these investment costs.

Services provided

Primary information and help on how to apply, and to find out if a company is eligible for MIA or Vamil can be found via the website of the National Office for Entrepreneurial Netherlands [Rijksdienst voor Ondernemend Nederland]. An “Environment List” is maintained and published which includes approximately 370 investments for which companies can apply in relation to the MIA or the Vamil or the MIA and Vamil. These investments (referred to within the Environment List as “Company Resources”) are less damaging to the environment and often go further than legal obligations.

Duration of support

Depending on the project, support is on-going, with the new environmental list for 2014 having been published in December 2013.

W.3 Results

Service uptake

The programme’s annual report for 2012 indicates how often companies applied for MIA or Vamil, and it states that the applications increased by 75% from 2011 to 2012.

For MIA, the number of enquiries in 2011 were 8,708, rising to 15,159 in 2012.

For Vamil the number of enquiries in 2011 were 8,950, rising to 15,709 in 2012.¹⁹⁷

Economic impacts

The economic impacts are dependent on the particular investment/technology.

¹⁹⁷ Agentschap NL (2013): MIA en Vamil: jaarverslag 2012 Milieu-investeringsaftrek/Willekeurige afschrijving milieu-investeringen [MIA and Vamil: annual report 2012 Environment Investment Rebate/Arbitrary depreciation of environmental investments], information downloaded from <http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2013/12/03/mia-en-vamil-jaarverslag-2012.html>

Social impacts

The social impacts are dependent on the particular investment/technology.

Environmental impacts

One particularly good example of an environmental impact of MIA and/or Vamil can be seen in the investment made by the company 'Peters Shipyards'. The company developed and built a tanker that is driven by an electric engine which runs on LNG (Liquefied Natural Gas). Use of these ships reduces CO₂ emissions by 25% and nitrogen oxide by 80%.

W.4 Costs

Expenditure

In the annual report, the average investment per application is calculated for both tax schemes individually.

MIA: € 124,000 in 2011 and € 119,000 in 2012.

Vamil: € 118,000 in 2011 and € 108,000 in 2012.

Sources of funding

For 2013, the sum of €101 million was listed as available for MIA and €24 million for Vamil.

W.5 Potential gains

The latest Environmental List of December 2013 has been published in the Government gazette for 2014, listing all environmental investments covered by MIA and/or Vamil. While recycling was previously limited to a certain amount of products or processes, all recycling initiatives are covered in the list. The Environment List 2014 is arranged differently, compared to the previous years. This reclassification has been explained with the reasoning that it allows better alignment with the developments in (environmental) policy and environmental technology. The Environment List 2014 is divided into environmental themes.

X. Programme Syntens Innovatiecentrum (NL)

X.1 Objectives

The Syntens Innovation centre [Syntens Innovatiecentrum] is an online based network that provides advice or contacts for Dutch companies wanting to "renew themselves sustainably". Syntens will change its structure from 2014 onwards, working with twelve regional trade chambers. When searching online for Syntens in January 2014, one is referred to the Chamber of Commerce [Kamer van Koophandel] website, which is said to

contain the information that had been displayed on the old Syntens website. However, this website structure is significantly different, but does contain information on start-up and innovation, which can be found quickly.

X.2 Programme structure and approach

Programme structure

On the old website, the interested company could search by sector, as well as by the expertise of the regional advisors. The website appears extremely accessible as, not only are telephone numbers displayed on the main page, but webinars and an online chat function is available as well. Also, the company interested in innovation can choose directly from web-based instruments, such as the innovation ‘quick scan’ or obtain advice on how the company could utilise social media.

The programme is structured in a three steps approach of which the company can select from one step, to all three of them. The first step describes Syntens as a sparring partner which asks questions and brings in new insights. The second step is the so-called “match-making” from which Syntens will help the company to find the right partner, whether it is a consultancy (such as TNO), university or other companies which are specialised in the knowledge or technology the company seeks. The last is the coaching step, in which the company can choose directly from a list of 230 advisors. This step also includes an aspect of aftercare in which the coach will visit the company further and discuss any progress made.

It should also be mentioned that the interested company can choose one of the advisors not only by expertise, such as ‘innovation advice’ or ‘business plans’, but also by their respective region. Also, Synten’s reach is international via the Enterprise Europe Network and it is said that they collaborate with 40 countries, 600 organisations and 3000 professionals.

Services provided

The emphasis is on networking and gaining knowledge which can be seen in all three steps.

Duration of support

Duration depends on the kind of support the company seeks, for example, if they are only interested in the inspiration session or specific advice from a coach.

X.3 Results

Economic impacts

It is said in the programme’s annual report that 72% of the SMEs that received advice from Syntens have implemented a new project.

Social impacts

13% of companies saw an increase in work opportunities (jobs) as a result of Syntens and 20% saw an increase in sales. Also, 78% of the companies advised by Syntens declared that they had formed a connection to other partners (institutes or companies) as a result. 93% of companies advised by Syntens reported an increased ability to innovate, 23% reported the realisation of concrete measures and 68% had reported the generation of a new idea as a result of Syntens input.

Environmental impacts

The environmental impacts are dependent on the specific project.

Y. ELEEN

Y.1 Objectives

This project aimed to support SMEs implementing methods and tools to reduce their impact on the environment, and increase their profitability. Main support services were in ecodesign, energy efficiency and environmental management systems (EMS), with focus on EUP, REACH, WEEE and RoHS legislations. The target group consisted of product manufacturing SMEs in four economic key sectors:

- Production and processing of metals
- Textiles
- Manufacturing of electronic/electric and components
- Surface treatment.

Y.2 Programme structure and approach

Programme structure

Participating countries included Sweden, Turkey, Italy, Spain and Slovakia. The project was coordinated from Sweden. Participating partners were research centres:

- Swerea IVF (IVF)
- METU Technopolis (METUTECH) – Turkey (Ankara)
- BIC Bratislava (BIC) – Slovakia (Bratislava)
- Network of Technological Centres in the Region of Valencia (REDIT) – Spain (Valencia)
- Consorzio Pisa Ricerche (CPR) – Italy (Pisa).

There was involvement from environmental service providers (ESPs) in helping SMEs with the assessment of environmental impacts and tailoring advice to minimise these. The ESPs supported SMEs in ecodesign, energy efficiency and environmental management systems

(EMS) with focus on EUP, REACH, WEEE and RoHS legislations. Cooperation agreements were signed with ESPs in each region.

Services provided

Each partner prepared and used their own ELEEN brochures to reach local ESPs and SMEs. SMEs were directly encouraged to receive support from the ELEEN project but were also invited to workshops where the opportunities were presented to them. Those interested SMEs were then forwarded to the selected ESPs which would regularly visit the company with EEN in order to deliver individualised second level service, such as a simplified Life Cycle Assessment (LCAs) or other environmental analysis.

To raise awareness about environmental legislation, the project partners organised 30 workshops together with ESPs, attracting over 875 participating SMEs.

Duration of support

The duration of support lasted from March 2010 to March 2012.

Monitoring & evaluation

After the service was delivered to the SMEs by the ESPs, the project partners carried out a satisfaction survey. This was carried out via a telephone call or email to ask the companies about their perceptions of the support given by the ESPs, for example, if they or their business had benefited as a result. The target was that 80%, or 250 of the 300 assisted SMEs would be satisfied and would have benefited with the second level support given in the ELEEN project. After conducting this beneficial survey among the assisted companies, 250 SMEs expressed their satisfaction with the support received, therefore the target was reached.

Y.3 Results

Service uptake

In total, the project has assisted 309 SMEs in Sweden, Turkey, Slovakia, Spain and Italy through the provision of individualised environmental services from March 2010 to March 2012.

Economic impacts

Although further information has been sought on the economic benefits, as well as the environmental benefits to companies from adopting environmental sound practices, this information was not found and the website of the project is no longer available. Country searches have also been conducted with limited success.

Social impacts

The evaluation survey concluded that approximately 80% of the SMEs receiving environmental support stated that they have benefited from the services provided by the ESPs, but no information is available on its social impacts.

Environmental impacts

No information available.

Y.4 Costs

Expenditure

There were seven projects funded through a 5.75 million EU contribution. No further information has been provided.

Sources of funding

The project was funded within the framework of the CIP-EIP Call for Proposals ENT/CIP/09/B/NO2S00 Specific Action “Services for SMEs in the field of environment through the Enterprise Europe Network” of the European Commission. There were seven projects funded through a 5.75 million EU contribution and involving 55 different EEN partners.

Y.5 Best practice examples

One of the main benefits of this project is the character of the services, i.e. bespoke services to companies.

One of the work packages consisted of promoting success stories of SMEs that have benefited from the services and presenting them in workshops and at the Enterprise Europe Network Annual Conferences and SG Environment meetings. In total there were 25 published success stories, but these could not be accessed as the website is no longer active.

Y.6 Potential gains

The project developed an internal management web tool allowing continued performance monitoring through the tool’s Result Table, where all activities are registered and listed. The library contains common documents, such as reports, deliverable reports, minutes from project meetings, etc. that could be extended to other SMEs, but the access to the website is currently unavailable.

Z. GREEN

Z.1 Objectives

The project supported the Enterprise Europe Network in providing 1st level environmental services to SMEs from the food industry and the manufacturing of building materials sectors. GREEN proposed a network of local systems to coordinate Environmental Service Providers (ESPs) in order to give SMEs access to free and low cost environmental services, thanks also to the support of local administrations, SMEs associations and relevant value chain stakeholders. Delivery tools included local cooperation agreements.

Z.2 Programme structure and approach

Programme structure

The project partnership was made of Chambers of Commerce and Industry (of local, regional and national levels) and covers 10 countries: 5 EU countries (involving 3 new Member States) and 5 non-EU countries as follows: Italy, Romania, Greece, Bulgaria, Slovenia, Montenegro, Croatia, Macedonia, Serbia and Turkey. The coordinator (UCV) was based in Italy.

Services provided

The main outputs were:

- two reports on existing environmental measures in support of SMEs in the food industry and the manufacturing of building materials sectors
- a database of environmental service providers (ESPs)
- the creation of a methodology to provide environmental services at local level which included the development of a strategy to establish partnerships with relevant Environmental Service Providers and the development of a methodology for providing environmental service, selecting and creating tailor-made services, monitoring and evaluating customers' satisfaction
- signing of 61 Local Cooperation Agreements with ESPs, Public Administrations and Trade Associations
- training sessions for Enterprise Europe Network (EEN) staff and project partners
- meetings or workshops to foster cooperation between ESPs and EEN.

Duration of support

From April 2010 to April 2012.

Monitoring & evaluation

Satisfaction questionnaires for workshops were filled in by participants during or just after the conclusion of the events, both in paper and electronic format. Individualised services, with special regard to the intention of using the methodologies and the expected benefits,

were evaluated through an online system included in the GREEN website that could be accessed by partner and selected ESPs only.

97.83% of respondents were 'satisfied' and 'very satisfied' with the technical competence of personnel, 95.79% considered 'satisfactory' and 'very satisfactory' the working diligence, punctuality of delivery and answers to requests and 93.81% were 'satisfied' and 'very satisfied' with the conformity of the service to Network partners and ESPs.

Z.3 Results

Service uptake

The main indicators for the project for the 2 year running period are given in the next table.

Table Z-1: Main indicators for the project		
Indicators for GREEN	2010-11	2011-2012
Number of Enterprise Europe Network staff receiving first level service training	197	160
Number of local consultants who transferred environmental practices (adoption of EMAS certificates, air emissions reduction, safety requirements, etc.)	71	148
Number of transferred good practices (construction efficiency, plastic treatment, waste management, green labelling and green washing, etc.)	19	33
Number of SMEs participating in workshops and other events	630	1369
Number of local ESPs with which cooperation agreements were signed for providing 2nd level services	61	91
Number of SMEs receiving environment-related 2nd level services (training, individual services, legal consulting, implementation of standards and company visits to give suggestions/advice regarding their environmental performance)	11	452
SMEs and organisations receiving information regarding environmental issues (legislation, standards) and GREEN project through partners' media (Partners' magazines, websites, leaflets, meetings and consulting)	20,000	95,000
Number of SMEs, ESPs, other organisations and specialised public reached through external media	80,000	34,000

Economic impacts

The project reported average savings per company for a number of indicators as follows:

- 8.54% reduction in the amount of water/raw materials/electricity used compared to previous situation
- 9.66% reduction is cost of water/raw materials/electricity used compared to previous situation
- A reduction in fees and fines of 9.6%.

Social impacts

The project reported the following:

- A reduction of 12.88% in the number of neighbourhood complaints (e.g. noise, traffic, air quality)
- 59.76% of companies perceived a high and very high improvement of the company's image compared to previous situation.

Environmental impacts

There are examples of savings and environmental benefits from the support offered (see below), but there are no aggregate project figures available for the whole of the project in terms of environmental impacts. The project reported average savings per company, in terms of:

- A reduction of the amount of waste generated of 9.35% compared to previous situation
- 8.25% increase in the amount of waste reused within the company
- 22.18% increase in the amount of waste sold as resource to other companies.

Z.4 Costs

Expenditure

No information provided.

Sources of funding

The project is funded within the framework of the CIP-EIP Call for Proposals ENT/CIP/09/B/N02S00 Specific Action “Services for SMEs in the field of environment through the Enterprise Europe Network” of the European Commission.

Z.5 Best practice examples

The project offers bespoke services to companies and uses local delivery partners. Examples of best practice are given below.

Bulgarian Chamber of Commerce and Industry
The Bulgarian Chamber of Commerce and Industry (BCCI) signed local cooperation agreements with four environmental services providers and got a letter of support from Sofia municipality. Three of the ESPs provided environmental services to 11 SMEs engaged in the construction sector. The environmental services consisted mainly of performing an energy audit for the SMEs involved and analysing their energy saving potential and possibilities for reuse of resources. A number of recommendations were given, such as how to

minimize and/or reuse industrial waste, how to be more energy efficient and what measures to implement in order to minimize expenses.

As a consequence of the action undertaken, a number of improvements were achieved, such as:

- 30 % improvement of the generated waste compared to the situation before the consultation;
- Increase of the amount of the reused waste within the company (one of the interviewed companies has declared 60% improvement, another company has declared 100% improvement compared to the previous situation)
- The companies declared that they have decreased the amounts of water, raw materials and electricity used
- All companies have declared improvement in the perception of the company's image
- All companies have declared high percentage of involvement of the human resources in the process.

Company in the food industry in Macedonia

The company has 11 employees and has more than 15 years of experience in the bakery industry. It consumes around 90 metric tons of raw materials per year in order to produce pastry products (80%) and bread (20%) to sell in its own pastry shop. Major raw materials used are flour, water, fat/oil, sugar, invert syrup, milk, yeast and other necessary additives like improvers and preservatives.

The company was interested in the benefits and preconditions of implementation of an environmental management system (EMS). An initial brief survey of the company indicated a high level of awareness and practices for energy efficiency and efficient use of raw materials. Certain measures for dealing with the organic waste were in place as well. At the same time, it revealed that very little was done when it comes to waste management in general. The areas of waste generation and types of waste were not characterized nor were preventive or treatment measures in place.

The company received specialized one-week training in EMS for gaining an in-depth understanding of the system and increase the awareness of the staff before starting the process of implementing the system. An ESP from the GREEN data base was selected by the company as a service provider for the implementation of ISO14001.

The results showed a reduction of water use and cost savings of 2.6% after the intervention and reduced noise exposure to average of 80db or 5% improvement. In addition, the company found a suitable solution for biological treatment of the wastewater. Generally, the company reported savings in operating costs and identification of potential sources for additional profit (e.g. sales of organic waste).

Z.6 Potential gains

SMEs can access the repository of ESP available at: http://www.green-eu.net/environmental_service_providers

In addition, ESPs can also register in the database. The Local Cooperation Agreement (LCA) is not legally binding, but is a letter of intent with the purpose of bringing the ESPs closer to SMEs within the food industry and the manufacturing of building materials sectors.

AA. GECKOS

AA1. Objectives

The aim of the project is to facilitate the uptake by SMEs of methods and tools, simultaneously reducing their impact on the environment at EU level and turning environmental challenges into economic opportunities. Aside to first level services like local websites or workshops to promote the most relevant knowledge, the core of the project is the delivery of individualised environmental services to SMEs in three priority sectors:

- Production and processing of metals
- Surface treatment
- Waste management.

AA2. Programme structure and approach

Programme structure

Although, originally, there were six partners from the following regions: Basse-Normandie (FR), the region of Hessen (DE), Pardubice (CZ), Madrid (ES), Luleå (SE) and Slovakia (SK), one of the partners, the region of Hessen (DE) decided to withdraw from 2010 April, after the 2 first months of the project.

Participating partners are:

- Regional Development Agency of the Pardubice, Czech Republic (Pardubice)
- National Agency for Development of Small and Medium Enterprises, Slovakia (Bratislava)
- Asociacion De Empresarios De Comercio E Industria Del Metal De Madrid, Spain (Madrid)
- AB Centek vid Luleå tekniska Universitet, Sweden (Luleå).

Services provided

Besides providing local websites or workshops to promote the most relevant know-how, the core of the GECKOS project consisted of the delivery of individualised environmental services to SMEs to achieve the implementation of good practices.

Duration of support

From March 2010 to February 2012.

Monitoring & evaluation

No quantitative survey has been carried out on the degree of satisfaction by the target group.

AA3. Results

Service uptake

At the end of the project (2012, February the 29th), all steps of the project have been achieved, as planned:

- 5 preparatory studies (1 per partner) are available
- 20 cooperation agreements signed with ESPs for providing 2nd level services
- 91 Enterprise Europe Network staff receiving first level service training at regional or national levels
- 31 workshops with 477 participating SMEs
- 87 SMEs received second level services
- New environmental practices were transferred to 22 SMEs.

Economic impacts

The project economic impacts for companies are summarised by the following indicators. These were based on survey results to evaluate the degree of perceived usefulness expressed after exchange of good practices to the 22 SMEs. The table indicates the percentage of cases of transferred good practices concerned by each indicator below. Companies also reported gains from selling metal waste as raw materials (5% of companies).

Table AA-1: Indicators for economic impacts		
Indicators	% of cases concerned	Examples of gathered data from some SMEs:
Amount of water/raw materials/electricity used	79%	Examples of gathered data from some SMEs: <ul style="list-style-type: none"> • 30% less water consumption • Reduce the quantity of water by 5 • Reduce up to 50% the consumption of electricity • Energy savings up to 30% after thermal insulation • Eliminate the need of water in the cooling system (savings of 186 litres of water per day)
Cost of water/raw materials/electricity used	95%	Examples of gathered data from some SMEs: <ul style="list-style-type: none"> • Reduce up to 30% the water cost • Reduce up to 16% the cost of electricity (savings of 13 247€ per year) • Reduce up to 16% the cost of gas (savings of 2 713€ per year) • Reduce up to 14% the cost of electricity (savings of 1 030€ per year) • Reduce up to 10% the cost of electricity (savings of 9 581€ per year) • Reduce up to 11% the cost of gas (savings of 2 104€ per year)
Environmental fees and fines	58%	Example of gathered data from some SMEs: <ul style="list-style-type: none"> • Reduce up to 30% the cost of purification taxes

Social impacts

The project's social impacts are reported in the following table.

Table AA-2: Indicators for social impacts		
Indicators	% of cases concerned	Examples of gathered data from some SMEs:
Number of neighbourhood complaints (e.g. noise, traffic, air quality)	16%	Example of gathered data from a SME: Reduction of air emissions to improve the quality of air
Perceived improvement of the company's image 5	3%	Examples of gathered data from some SMEs: Consequent improvement of company image Clients want to cooperate with a green partner The air quality is much better inside the factory and now is a more pleasant place to work

Environmental impacts

There are examples of savings and environmental benefits from the support offered, see below.

Table AA-3: Indicators for environmental impacts		
Indicators	% of cases concerned	Examples of gathered data from some SMEs:
Reduction of the amount of waste generated	42%	Examples of gathered data from some SMEs: <ul style="list-style-type: none">• 7% - long-term impact estimated by a company• 20%
Amount of waste reused within the company	21%	Examples of gathered data from some SMEs: <ul style="list-style-type: none">• 5% long-term impact estimated by a company• From 10% to 15%• Reused of cardboard (not measured)• Reused of waste of paint (not measured)

AA4. Costs

No information provided.

Sources of funding

The project is funded within the framework of the CIP-EIP Call for Proposals ENT/CIP/09/B/N02S00 Specific Action "Services for SMEs in the field of environment through the Enterprise Europe Network" of the European Commission. No further information has been provided.

AA5. Best practice examples

The project offers bespoke services to companies and uses local delivery partners but no specific examples of best practices have been provided.

AA6. Potential gains

Not known.

AB. ESMI

AB1. Objectives

The ESMI project implemented a study on the environmental impact from the metalworking sector and perceived needs for environmental management.

AB2. Programme structure and approach

Programme structure

The partners included chambers of commerce and companies in eight countries. The leading partner was Agro Business Park A/S, based in Denmark (Tjele).

Other partners included:

- Chamber Of Commerce And Industry Vratsa, Bulgaria (Vratsa)
- EISC Ltd. - European Information Service Centre Limited, UK (Southampton)
- ICS Internationalisierungszentrum Steiermark GmbH, Austria (Graz)
- ITD Hungary Non-Profit Public Benefit Private Limited Company, Hungary (Budapest)
- Länstekniskt Centrum Jönköping, Sweden (Jönköping)
- Mariborska Razvojna Agencija, Slovenia (Maribor)
- Steinbeis-Europa-Zentrum der Steinbeis Innovation GmbH – SEZ, Germany (Stuttgart)
- Estonian Chamber of Commerce and Industry, Estonia (Tallinn)
- Unioncamere Veneto, Italy (Venezia).

Services provided

The project identified and contacted potential metalworking industry stakeholders and built a list of ESPs in the public and private sector, in a variety of fields and disciplines including ISO 14001, EMAS, Energy Saving Specialists and Life Cycle Analysts.

Duration of support

The duration of support lasted from 2010 to 2012.

Monitoring & evaluation

A survey was carried out in all regions by a variety of means: telephone, paper and online questionnaires.

AB3. Results

Service uptake

No information available.

Economic impacts

The project economic impacts for companies are summarised by the indicators in the following table:

Table AB-1: Indicators for economic impacts		
Indicators	% of cases concerned	Examples of gathered data from some SMEs:
Amount of water/raw materials/electricity used	Numbers collected in different manner and therefore difficult to compare	<ul style="list-style-type: none">• Austria: Specialist for boiler production reported a total of 23,5% reduction in gas consumption, a reduction of 30% in energy consumption• Estonia: Company 1 –Savings of 365-400Kw/h per month electricity used.• Slovenia: Both advised SMEs succeed to reduce raw materials, water and electricity. First SME for 5% and the second SME for 15%.• Bulgaria: 36% reduction• Sweden: 44% reduction in electricity used• Italy 8,54% reduction• Hungary: Reducing gas used for heating by 5% and water usage by 20% compared to base year 2011
Cost of water/raw materials/electricity used	95%	<ul style="list-style-type: none">• Germany: In RHV's case the costs for material used is 270.000 Euros/year for powder coating material, and other metal parts. The costs of gas and oil is at 90.000 Euros/year. A new technical solution has been suggested and energy costs up to 30.000 Euros/year are expected to be saved• Bulgaria: Electricity cost will be reduced by 48%• Sweden: € 210.000 per year savings in electricity• Italy: 9.66% savings in costs (but not specified)
Amount of waste sold as resource to other companies		<ul style="list-style-type: none">• Slovenia: One SME succeed to increase of waste sold as a resource to other companies by 20% and other SME succeed to increase by 10%.• Bulgaria: The company is selling 15% of waste materials to other companies who could use it as a resource.
Environmental fees and fines	58%	<ul style="list-style-type: none">• Bulgaria: A SME using energy saving machinery has reduced their environmental tax by 20%.• Italy: A company reducing fees by 9.6%• Denmark: A company estimated a reduction in costs

Table AB-1: Indicators for economic impacts		
Indicators	% of cases concerned	Examples of gathered data from some SMEs:
		relating to environmental measurement and evaluation of approximately € 7.000-14.000 per year, with an increased turnover of ca. € 140.000 per year due to compliance.

Social Impacts

The project reported some social impacts. These are summarised in the next table (NB: some figures reported have been omitted from the table due to difficulties in interpretation).

Table AB-2: Indicators for social impacts		
Indicators	% of cases concerned	Examples of gathered data from some SMEs:
Number of neighbourhood complaints (e.g. noise, traffic, air quality)		<ul style="list-style-type: none"> • Slovenia: One SME reported approximately 5% decrease of neighbourhood complaints
Perceived improvement of the company's image		<ul style="list-style-type: none"> • Denmark: Company expected to have a 50% increase in turnover as they can now demonstrate the necessary management and environmental certification. Another company claimed that the ESMI project had safeguarded an annual turnover of € 7 million and 75 jobs. • United Kingdom: A company reported new clients as a result of ISO14001 registration following ESMI project • Slovenia: Both of SMEs reported 20% improvement of the company's image • Germany: The SMEs are expecting some improvement of their image once the systems have been implemented. RHV perceives and expects to perceive more improvement in its image since the company has made a film of its results during ESMI with the SEZ.

Environmental Impacts

There are examples of savings and environmental benefits from the support offered, see below.

Table AB-3: Indicators for environmental impacts		
Indicators	% of cases concerned	Examples of gathered data from some SMEs:
Reduction of the amount of waste generated	42%	<ul style="list-style-type: none"> • Denmark: A company reduced the following waste streams:

Table AB-3: Indicators for environmental impacts

Indicators	% of cases concerned	Examples of gathered data from some SMEs:
		<ul style="list-style-type: none"> ○ Wood: 6890 kg flammable waste reduction ○ Paper and cardboard: 7560 kg corrugated cardboard, 5550 kg paper. In total 13110 kg reduction ○ Chemicals: 5 kg reduction • Austria <ul style="list-style-type: none"> ○ Hazardous waste – reduction of 15% of emulsions ○ Waste – reduction of 20% through reinforcement of separate waste collection ○ Waste – reinforcement of separate waste collection, new inventory management system reduces waste, optimisation of material usage, reduction of 10% • Slovenia: Both ESPs (2) which provided Individual consultancy to SMEs that showed a 10% reduction of the amount of waste generated. • Germany: A company has high material costs in adhesive coatings and coating powder material. The analysis showed the potential of a waste reduction by up to 50% • Bulgaria: 35% reduction in waste • Sweden: 44% average reduction in CO2 • Italy: 9,35% average reduction in waste • Hungary: 6 companies reduced communal waste materials by 30 % compared to base year 2011.
Amount of waste reused within the company	21%	<ul style="list-style-type: none"> • Slovenia: A company reported 10% increase in the amount of waste reused within the company. A second company reported a 15% increase • Bulgaria: A company reported over 2/3 of the generated waste could be reused by the company • Italy: A company reported increase of 8,25% of waste reuse • Hungary 100% recycling of ceramic shell materials and an increase of recycling by 30% compared to base year 2011

AB4. Costs

No information provided.

Sources of funding

The project is funded within the framework of the CIP-EIP Call for Proposals ENT/CIP/09/B/N02S00 Specific Action “Services for SMEs in the field of environment through the Enterprise Europe Network” of the European Commission.

AB5. Best practice examples

The project offers bespoke services to companies and uses local delivery partners.

AB6. Potential gains

Not known.

AC. EnviSMART

AC1. Objectives

EnviSMART focused on three sectors (chemicals, production/processing of metals and surface treatment), since all three sectors are characterised by an often negative impact on almost every environmental aspect. The overall goal is both to contribute to the reduction of SMEs' environmental impact through the provision of environmental services and to the profitable growth of their business in the targeted sectors.

AC2. Programme Sstructure and approach

Programme structure

There were 8 partners from 6 different countries:

- ZENIT GmbH, Germany (Mülheim an der Ruhr)
- Malta Enterprise, Malta (San Gwann)
- CCIAA Milano- Innovhub, Italy (Milano)
- Næstved-area Development Co. Ltd., Denmark (Tjele)
- Regionalne poradenske a informacne centrum Presov, Slovakia (Prešov)
- Foundation for Research & Technology – Hellas / Help-Forward Network, Greece (Athens)
- Ceramics and Refractories Technological Development Company S.A., Greece (Chalkida)
- Stiftung für Technologie, Innovation und Forschung Thüringen, Germany (Erfurt).

Services provided

Workshops (including aspects such as ISO certification) and personalised advice to companies from ESP.

Duration of support

From 2010 to 2012.

Monitoring & evaluation

Not known.

AC3. Results

Service uptake

Not known.

Economic impacts

Not known.

Social impacts

Not known.

Environmental impacts

Not known.

AC4. Costs

No information provided.

The project is funded within the framework of the CIP-EIP Call for Proposals ENT/CIP/09/B/N02S00 Specific Action “Services for SMEs in the field of environment through the Enterprise Europe Network” of the European Commission.

Sources of funding

No information provided.

AC5. Best practice examples

The project offers bespoke services to companies and uses local delivery partners. Examples are given in the next box.

Best practice examples
<p>ZENIT in North Rhine Westphalia, Germany</p> <p>An Environmental Service Provider, which is a long-standing client of ZENIT, is an expert in the field of recycling of plastics, metals and chemicals. The idea of using this company's knowledge to create a guideline on recycling of more difficult compounds came as a result of the preliminary study on the sector's environmental challenges. Together with the ESP, a company was found in machine manufacturing. The alloyed scrap produced was too much to just throw it away, whilst recycling and reusing it however had been too costly so far. The ESP was therefore hired to create a guideline on how to recycle the alloyed scrap metal in order to resolve the issue facing the client company.</p>

North-Denmark EU Office

A Danish company participated in the four workshops about ISO certification held under the auspices of the EnviSMART project.

During these workshops, the company was instructed on how to go about building an integrated management system, which can be certified according to ISO 14001, OHSAS 18001 and ISO 9001. The company learned techniques that can help to ensure that there are continual improvements in products, processes and workflows.

Participation in the project also meant that the company obtained a better focus on efficient use of resources less due to better management via guidelines and competency management, more recycling, better waste separation, a focus on using as little environmental damaging agents and chemicals as possible and better management of consumption of water, gas and electricity. Participation in the project has also given the company economic benefits, because the certification will help ensure retention of current customers, and opens up the way for new business partner opportunities. The company expects revenue growth of 10 % within 1 to 2 years.

Source: <http://www.envismart.eu/Default.aspx?tabid=311&language=en-GB>

AC6. Potential gains

Not known.

AD. Green Network (Denmark)

AD1. Objectives

The Green Network is a regional network in Denmark that brings together public authorities and companies, with the aim of promoting business sustainability companies (Bio IS, 2009)¹⁹⁸. Its objectives relate to four dimensions of Corporate Social Responsibility (CSR): environment, health promotion, social commitment and occupational health & safety (Green Network, nd)¹⁹⁹.

This is also confirmed by Nielsen (nd)²⁰⁰, who notes that the objectives of the programme include the promotion of sustainability in the following fields:

- environment and climate
- work employees safety
- social commitment
- health promotion.

¹⁹⁸ Bio IS (2009): **Green Network**, available at http://ec.europa.eu/environment/emas/pdf/StepUp/EMAS_BIO_EMSFS_GreenNetwork_FINAL_Feb.pdf

¹⁹⁹ Green Network (nd): **Green Network**, available <http://www.greennetwork.dk/>

²⁰⁰ Nielsen (nd): **Green Network Denmark**, available at <http://www.csrcyprusnetwork.com/wp-content/uploads/2012/10/Green-Network-presentation-Compatibility-Mode.pdf>

The improvements that are voluntarily undertaken by companies are over and above legal requirements (iisd, nd)²⁰¹. According to Bio IS (2009), *“the company chooses the manual or manuals they will use and commit themselves to continuous improvements within the chosen work area: social commitment, environment or occupational health and safety, or a combination of these.”* As such, it is possible that some companies taking part in this programme are actually not implementing measures to improve their environmental performance but are rather pursuing goals relating to the other dimensions of CSR.

Examples of beneficial environmental practices include energy conservation, waste separation, and climate sensitive strategies (Green Network, nd b)²⁰².

AD.2 Programme structure and approach

Programme structure

The Green Network is a regional network that comprises both municipalities and private companies. The chairman of the Green Network is always appointed from the private sector (Bio IS, 2009). One half of the board is from the public sector with the other half being from the private sector (iisd, nd).

Services provided

The Green Network provides advice on strategic CSR. This includes the mapping of business needs and strategic goals, designing solutions and evaluations. Generally speaking, the approach focuses on the strategic level before recommending practical solutions, regardless of whether this relates to, for example, social and human rights in the production and supply chain, the environment and health of the company and product life cycles, business ethics, CSR communication, the Global Reporting Initiative (GRI), etc. (Green Network, nd).

According to Nielsen (nd), the Green Network provides short and readable manuals advising companies on sustainability reporting. Companies can choose to meet the requirements of one or more manuals (iisd, nd). Support tools for companies compiling a sustainability report are provided. The report is then evaluated by the Green Network and (if approved), an environmental certificate is awarded to the company in question. The Green Network certificate is valid for three years. The renewal process involves drawing up a new statement which assesses whether previous goals have been met and sets more demanding goals for the upcoming three years (Bio IS, 2009).

The main tool is the Environment and Climate Manual which provides guidance to companies on how to prepare an Environmental Statement, or an Environmental and Climate Statement. This comprises the following basic steps (Green Network, nd c)²⁰³:

²⁰¹ iisd (nd): Green Network, available at <http://www.iisd.org/measure/compendium/DisplayInitiative.aspx?id=2066>

²⁰² Green Network (nd b): Environment, available at <http://www.greennetwork.dk/page1181.aspx>

²⁰³ Green Network (nd c): Environmental Handbook, available at <http://www.greennetwork.dk/lib/file.aspx?fileID=2730>

- mapping;
- assessment;
- goals and action plan;
- implementation.

A wide range of environmental aspects are taken into account. The ones that appear to be most relevant to resource efficiency are energy, water, commodities, packaging, products and waste (Green Network, nd c).

A free energy audit and suggestions for improvement are provided to shops with less than 10 employees that hold the Climate Shop label (Green Network, nd). Annual membership costs €120 per year. The audit appears to be conducted via an online self-assessment. Advice on electricity, heating and ventilation improvements is then provided free of additional charge by external consultants; the programme's partners include a bank that provides loans for improvements (Green Network, nd a)²⁰⁴.

The Green Network also provides a platform for the exchange of experience between companies (Nielsen, nd).

It is possible that improvements can be achieved by means of reducing companies' environmental footprint (e.g. emissions). In theory, such improvements may be achieved by means of lowering consumption or footprint per unit consumed (e.g. switching to a green energy supplier). Please note that it has not been possible to confirm whether members of the Green Network actually have to reduce their resource consumption. For example, as regards energy, the Environment and Climate Handbook requires companies to address indirect emissions from purchased electricity and heat (CO₂, SO₂, NO_x) (Green Network, nd c).

Duration of support

Companies are re-certified every three years (Bio IS, 2009; iids, nd). Support is therefore provided on a long-term basis.

Monitoring & evaluation

Several success stories are provided on Green Network's Internet site. These include a company which recouped investment in improved lighting in the first year and another company which realised monthly savings at 35-40% of its investment (Green Network, nd a).

²⁰⁴ Green Network (nd a): Be Green Network Climate Shop, available at <http://www.greennetwork.dk/lib/file.aspx?fileID=2514>

AD.3 Results

Service uptake

The membership of Green Network comprises 170 entities; these include companies and at least two municipalities (Green Network, nd). However, it is possible that the number of companies that are pursuing environmental goals is lower, as Green Network (nd) notes that not all companies have adopted measures on all four dimensions of CSR.

The Green Network is *“open to all types of businesses in all sectors: small and large, production and service institutions and utilities, agriculture and aquaculture”* (SPIN, 2010)²⁰⁵.

The Green Network’s Environmental Handbook was first published in 1996 and has since been used by more than 300 companies, as well as several hundred companies in other parts of the country (Green Network, nd c). Since 2006, the Key 2 Green Handbook has been used and the continued development of the handbook has been conducted jointly by all Danish green networks. The current edition was published in December 2011 and deals with both environmental and climate considerations.

Environmental impacts

The Green Network uses the same environmental performance indicators as Key 2 Green and in fact companies are referred to the Key 2 Green Internet site. These indicators include (Green Network, nd d)²⁰⁶:

- electricity consumption
- heating
- heating oil, wood and straw
- natural gas
- transportation
- wastewater
- water
- conversion factors.

AD.4 Costs

Expenditure

Information for 2000 suggests that the annual turnover was approximately €135,000 (DKK 1 million)²⁰⁷. Secretarial costs were covered by the Vejle County Council (Idebanken, nd).²⁰⁸

²⁰⁵ SPIN (2010): Country Report - Denmark, available at http://spin-project.eu/downloads/Contryreport_DK.pdf

²⁰⁶ Green Network (nd d): Environmental Performance Indicators, available at <http://www.greennetwork.dk/page1272.aspx>

Sources of funding

Sources of funding include municipal funding, membership fees, and external funding from government agencies (project funding) (iisd, nd).

AD.5 Best practice examples

Sustainability reports produced by companies are publically available; companies are also required to draw up reports documenting their achievements (Green Network, nd c).

The environmental statement drawn up by companies includes targets and evaluation criteria (key indicators) thus making their success measurable. This also enables comparisons with other companies. Key figures/ratios may include for example, environmental performance per weight, volume and production time (e.g. kg CO₂ per kg product) (Green Network, nd c).

The Environmental and Climate Handbook encourages companies to describe the environmental performance of their supply chain, including the proportion of suppliers that have established environmental and climatic requirements for their operations and a description of these requirements (Green Network, nd c).

AE. Clean Business Programme (Poland)

AE.1 Objectives

The Clean Business Programme was established as a joint effort involving the Polish Environmental Partnership Foundation (PEPF), Groundwork UK and BP, and the programme has been in existence since 1998.

The objective of the Clean Business Programme appears to be the support of Polish businesses, and in particular SMEs, in adopting sound environmental practices. The Clean Business Programme aims to “help Polish SMEs [...] improve their resources management and reduce their negative environmental impact through the reduction of energy, water, materials use and waste minimisation.” It also aims to demonstrate that improving environmental performance can make business operations more cost-effective (Clean Business, nd)²⁰⁹.

Serafin (nd) characterises the Clean Business Programme as “a self-help scheme that helps SMEs improve their environmental performance as a means of improving their business

²⁰⁷ Converted using the average exchange rate for 2000 (DKK1=€0.134) obtained from <http://www.oanda.com/currency/historical-rates/>

²⁰⁸ Idebanken (nd): Green Network, available at http://www.idebanken.no/english/Goodexamples/bibliotek_engelsk/ProjektID.asp?ProjektID=293

²⁰⁹ Clean Business (nd): About Us, available at <http://czystybiznes.pl/en/about-us>

performance.” In addition, the Clean Business programme aims to complement government efforts by involving the private sector (Serafin, nd).

The aims of the programme differ slightly depending on the target audience. The programme is aimed at (Clean Business, nd):

- SMEs in the manufacturing and service sectors which want to improve their environmental or health and safety performance
- large companies that wish to reduce their operating costs by encouraging their suppliers to take part in a “supply chain programme” or becoming a patron of the Clean Business Programme
- local authorities.

The programme’s targets include carrying out 200 environmental audits of companies and elaborating 150 improvement programmes. This is expected to result in 100 companies achieving the following environmental improvements (Clean Business, nd):

- reduction in energy use (average 10%)
- reduction in water consumption (average 20%)
- reduction in materials use (average 5%)
- minimising waste and emissions (average 10%).

Serafin (nd) describes the Clean Business Programme as “*a self-help scheme to motivate SMEs to*

- improve their own environmental performance by achieving cost-savings and increasing their competitiveness through improvements in day-to-day business operations
- undertake joint action with other companies to bring about environmental improvements in a specific geographic area, such as the surroundings of a factory or in communities, which are important for the company’s products or services
- get involved with partners from the public and civil society sectors in longer term action for the environment and social revitalization of local communities.”

AE.2 Programme structure and approach

Programme structure

The Clean Business Programme is implemented through Clean Business Clubs. These are organised regionally and bring together member companies in each region. Currently, there are 16 such clubs with a total membership of around 400 companies. These clubs are responsible for providing advice and training to companies. Each club is run by a co-ordinator. The Clean Business Programme aims to establish further clubs in other regions (Clean Business Club, nd).

As noted in Serafin (nd), in order to access the services of the Clean Business Programme, companies have to join a Clean Business Club. These clubs provide companies with *“advice, training and opportunities through an information centre and a network of environmental advisors aimed at:*

- lowering production costs and increasing profits by improving management of waste, energy other resources
- reducing environmental impacts of business operations
- learning from the practical experience of other Clean Business companies.”

Services provided

The Green Business Programme provides *environmental audits and improvement plans*. In addition, the Green Business Programme *“provides companies with opportunities to become engaged in long-term projects with NGO and local government partners”* (Green Business, nd).

The purpose of an environmental audit is to *“identify and deal with the most common environmental problems”* while an improvement programme aims to *“reduce environmental impact based on investment and non-investment solutions to identified problems”* (Clean Business, nd).

To help companies implement environmental investments the Polish Environmental Partnership Foundation will involve financial institutions to work together to develop a friendly and affordable for businesses financing mechanisms for environmental investments.

The project also uses an interactive Internet tool (called the Environment Manager); this tool was developed by the Polish Environmental Partnership Foundation, supported by funding from the EU Life Environment project (2004-2006) (Clean Business, nd). The Environment Manager allows them to *“assess and monitor their progress in improving their environmental performance”* (Serafin, nd).

More specifically, the following services are provided to SMEs (Serafin, nd):

- helpline to discuss specific issues (in addition, a database of past questions and answers can also be accessed online)
- technical advisory/training manuals presenting detailed practical advice for eight industry sectors (motor, mechanical, medical, food, construction, tourism, office and plastic processing)
- peer-to-peer learning (seminars, conferences, workshops and other events)
- online tool to benchmark companies’ environmental performance
- online record of each company’s environmental achievements (available only to that company).

Duration of support

As noted above, the duration of support can be extended by means of directing companies to long-term projects run by NGOs and local government partners.

Monitoring & evaluation

A survey of Clean Business members is undertaken annually. This survey is used to evaluate the programme. Together with the analysis of helpline questions and environmental reviews and other comments received from Clean Business companies, this information is used to improve the advice provided by the Clean Business programme (Serafin, nd).

AE.3 Results

Service uptake

As noted above, there are currently 16 Clean Business Clubs, which have around 400 members (Clean Business, nd a). According to Serafin (nd), as of August 2006, 330 SMEs “were actively involved in the programme.”

The targeted uptake of the Green Business was (Clean Business, nd a)²¹⁰:

- 200 environmental audits
- 150 improvement programmes to address any identified issues and reduce companies’ environmental impacts.

Serafin (nd) notes that over the course of two years 200 environmental audits were completed and these identified 800 environmental problems. In addition, environmental advisors assisted companies in introducing over 120 major environmental improvements.

Economic impacts

Serafin (nd) notes that available estimates show that *“each Euro invested through Clean Business generates at least an additional Euro for member companies as a direct result of technical assistance provided through the scheme.”*

The Clean Business Programme aims to demonstrate that good environmental management can “make business operations more cost-effective and profitable.” It is further expected that the Clean Business Programme supports SMEs in reducing their production costs and environmental performance, thus boosting their competitiveness and profitability (Clean Business, nd). Serafin (nd) also suggests that the Clean Business Programme has enabled participating businesses *“to develop business links with companies that place a premium on environmental performance and continuous improvement.”*

²¹⁰ Clean Business (nd): Project, available at <http://czystybiznes.pl/en/project>

According to Serafin (nd), the key advantage of the Clean Business Programme is its emphasis on self-help rather than expensive consultancy services which many SMEs could not afford.

Both positive and negative experiences are recorded and shared with other companies through Environment Manager Internet application (Serafin, nd).

A case study of the electric engine manufacturer Tamel shows that the new air compressor installed by this company led to such savings that the investment was recouped within two years. The investment payback period for energy recovery systems installed by Bieskidy Confectionary was less than a year.

Social impacts

According to Serafin (nd), the Clean Business Programme has helped companies “*safeguard jobs and provide opportunities for staff development*”; however, no further detail is provided.

Environmental impacts

According to Clean Business (nd a), the targets of the Clean Business programme were to achieve the following in 100 companies (which were to be assisted by means of designing an improvement programme):

- reduction in energy use (average 10%)
- reduced water consumption (average 20%)
- reduction in materials use (average 5%)
- minimisation of waste and emissions (average 10%).

It is of interest that “*in return for receiving advisory services, companies commit to improving their environmental performance based on an environmental review of operations carried out by Foundation specialists*” (Serafin, nd).

Among environmental achievements of the Clean Business Programme, Serafin (nd) notes that the programme has enabled companies to:

- “make more efficient use of their resources
- reduce pollution
- ensure compliance with environmental, health and safety regulations and adapt to EU standards
- access the latest international environmental technology
- motivate their workforce to take action on health, safety and environment.”

Serafin (nd) has argued that, in addition to environmental improvements implemented by member companies, “the real contribution” of the Clean Business programme lies in the fact

that it has fostered a *“favourable climate for cross-sector partnerships involving business in joint action with the public sector, NGOs and citizens.”*

Case studies include electric engine manufacturer Tamel which installed new air compressors resulting in reduced energy consumption by 108 kW and Ewa Glassworks Ltd which developed an innovative method for reusing multi-coloured glass waste, eliminating VOC emissions and achieving 80% energy savings. In addition, the Bieskidy Confectionary introduced systems to recover waste heat which resulted in the elimination for external energy requirements for water heating; recovered energy was 1188GJ/year which was used to heat 3600m³ of water (Serafin, nd).

AE.4 Costs

Expenditure

The core operational costs of the Clean Business Programme require €200,000 each year (Serafin, nd).

Information on costs and benefits of measures implemented by winners of the Clean Business Award is provided in Serafin (nd). This includes the following examples: (Serafin, nd):

- Wawel introduced measures to improve its energy, water and waste efficiency, which included the installation of closed water circulation (resulting in annual savings of approx. €17,000), noise level reduction, recycling condensate heat from heating water for production and individual use (annual savings of €7,000), upgrading sewage treatment and reducing thermal discharge, closure of an ammonia engine room (annual savings of approx. €50,000), reducing the threat of chemical contamination and potential impact on human health, modernization of a gas heating system (annual savings of €20,000), closure of a coal-fired boiler house (annual savings of approx. €43,000)
- Jan Ozga bakery (in collaboration with the Tarnawa Flue Construction company) installed a bespoke heat exchanger, resulting in direct monthly cost savings of around €400, monthly cost savings on central heating of approximately €250 (which amounts to only 40% of previous energy bills). This measure also alleviated the problem of excessive humidity in the bakery and resulted in additional cost savings – high humidity previously affected product quality and resulted in the need to redecorate frequently (4-5 times per year). Dry floors have also provided a safety benefit.

Sources of funding

Since its inception in 1998, the Clean Business Programme has received funding from a variety of sources.

Initially, 80% of funding was provided by BP and the remaining 20% was donated by the UK Know How Fund. In total, BP agreed to provide USB 2.3 million over seven years. In 1999, additional funding was secured from the UK Department for International Development

(DfID) and in 1999-2000, funding was also provided by the EU Phare Partnership Programme. Additional funding was also secured from local and regional government and private donors. This was followed by increasing significance of membership fees to cover operational costs of individual Clean Business Clubs (Serafin, nd).

In 2004, the Clean Business Programme secured a €500,000 grant from the EU LIFE programme for a three year project to develop an Internet tool called the Environment Manager.

Between 2008 and 2011, the Clean Business Programme was supported by a grant from Iceland, Liechtenstein and Norway through the EEA Financial Mechanism and the Norwegian Financial Mechanism (Clean Business, nd).

The Polish Environmental Partnership Foundation also aimed to collaborate with financial institutions on the development of businesses financing mechanisms for environmental investments (Clean Business, nd).

AE.5 Best practice examples

The Clean Business Programme is a 'bottom-up', collaborative approach that encourages the building of partnerships, thus facilitating peer learning (Serafin, nd). In addition, this programme aims to encourage SMEs to treat environmental improvements as a business opportunity rather than bureaucracy & additional cost.

Serafin (nd) has identified the following ten factors that have contributed to the success of the Clean Business Programme:

- *“The scheme was business-led and seen to be business led. This encouraged companies to participate.*
- *The emphasis has been on exchanging experiences between companies, rather than transferring information from various types of SME support agencies.*
- *Participation in community-based initiatives was never treated as an add-on, but as something essential to business success.*
- *A commitment must be made for the long run by both companies and the Clean Business team. Companies have to take responsibility for their own environmental management and planning.*
- *Monitoring cost savings and environmental impact are crucial motivating factors.*
- *Large companies are essential for mobilizing small companies.*
- *Continuous improvement is essential, especially based on feeding back success stories and positive experiences of high achievers.*
- *Public sector involvement is essential, especially in establishing environmental priorities and enforcing compliance.*
- *Benefits for companies must always translate into increased sales and improved business performance. Benefits for the wider community must always translate into reduced environmental impacts and social benefits, such as jobs and improved infrastructure.*

- *The scheme was always intended to supplement and add value to public-sector environmental improvement and business support programmes, and never treated as a competitor or alternative to public sector programmes.”*

AE.6 Potential gains

There are approximately 2.3 million SMEs in Poland (Serafin, nd).

AF. The Hackefors Model (Sweden)

AF.1 Objectives

It appears that the objective of this tool is to facilitate the adoption of environmental management systems among SMEs (Altea, nd)²¹¹. The ultimate aim appears to be the provision of compliance assistance and the improvement of environmental performance of companies. This programme focuses on SMEs (EC, nd)²¹².

AF.2 Programme structure and approach

Programme structure

This programme is run by Altea AB, a private company which developed the model and currently offers the model to companies on a commercial basis. Altea AB has been set up for the sole purpose of running the Hackefors Model (EC, nd).

Participating companies form a cluster. Each company appoints an environmental manager. This leads to the formation a steering group and appointment of a central co-ordinator. As noted in EC (nd), *“the co-ordinator is responsible for the network and the common parts of the system, including common documentation. The co-ordinator acts as a hired and shared environmental manager of the group.”*

Services provided

The Hackefors Model facilitates cooperation among similar companies that then work together to implement environmental management systems, such as ISO 14001, ISO 9001, OHSAS 18001, EMAS, etc. This enables companies to pool resources and the implementation of these systems thus becomes more economical. Companies are supported by Altea AB and an accredited certification company (Altea, nd).

Although each company applies for certification independently, *“a large part of the documentation is identical for all companies”* which results in cost savings (EC, nd). The

²¹¹ Altea (nd): The Hackefors Model, available at <http://altea.se/hackeforsmodellen>

²¹² EC (nd): Case 13: Hackefors Model, available at http://ec.europa.eu/environment/sme/pdf/hackefors_model_en.pdf

Hackefors Model provides support to SMEs throughout the certification process, including monthly meetings, training and site visits (EC, nd).

Duration of support

Support is provided both throughout the certification process and further support provided post certification if the company requires (and pays for) additional services.

Monitoring & evaluation

The programme has been assessed in the past. This included a survey of companies undergoing certification (EC, nd). This programme has also been evaluated in European Commission documents (EC, nd; EC, 2007).

AF.3 Results

Service uptake

According to Altea (nd a)²¹³, the Hackefors Model has been in existence since 1996 and, since then, participating companies have been awarded about 1,900 certificates of conformity with international standards.

EC (nd) and EC (2007) note by 2004, the Hackefors Model certified about 600 firms in about 40 networks, as well as 6-8 companies abroad. The great majority were SMEs and only two companies had more than 1,000 employees.

Economic impacts

This programme enables SMEs to achieve an environmental certification at a reduced cost and with less administrative burden. In addition, the model facilitates future maintenance of the certification. This also includes saving on consultancy fees (EC, nd). EC (2007) quotes a comparison undertaken by the service provider which indicates that the cost of a group certification is about 65% lower than that for individual certifications. In addition, a group of companies can negotiate better rates for external audits and save money due to co-ordination of training (EC, 2007).

For example, with regard to external audits, EC (nd) notes that *“a group of enterprises can have a bargaining advantage when negotiating the choice of an external auditing authority than would be the case if negotiated individually. For example, the price of external audits agreed with certification companies is cheaper, because the overall time spent for auditing a whole network is shorter, given that many documents are the same in every company. The use of internal auditors is also cost effective compared to having one internal auditor at every company or using external consultants.”*

²¹³ Altea (nd a): About Altea, available at <http://altea.se/en/about-altea>

EC (nd) refers to a study of the Hackefors Model which found that the programme resulted in “energy cost savings, improved relationships with customers, increased interest in training, and certification cost savings as a result of group certifications.”

Social impacts

An internal evaluation of the Hackefors Model concluded that the programme has resulted in increased interest in training and led to participating companies engaging in collaborative undertakings in many other areas, such as training and recycling (EC, 2007). Over one third of companies that participated in the Hackefors Model subsequently engaged in collaborative projects in other areas (EC, nd).

Environmental impacts

A survey of companies participating in the Hackefors Model suggests that 55% of responding companies would not have achieved ISO 14001 without participating in this programme. This assessment also concluded that the Hackefors Model has resulted in energy cost savings (EC, 2007).

AF.4 Costs

Expenditure

It took 1.5 years to develop the Hackefors Model but an estimate of start-up costs is not available (EC, nd).

EC (2007)²¹⁴ suggests that Altea AB employed seven people and had an annual turnover between €550,000 and €650,000. Since the management of the Hackefors Model is the only activity undertaken by Altea AB, its turnover is a reasonable indication of the cost of this programme’s management. An undated document (EC, nd) suggests that the post-certification fee is around €75-€100 per month or €900-€1,200 per year.

Participating enterprises pay a fee to the Hackefors Model. Additional costs are incurred when applying for certification. These costs are reproduced below from EC (nd). Please note that the source of this information is an undated document and, therefore, it is not clear how much these costs differ from the current fees. However, these costs were converted to Euros using 2006 exchange rates, thus indicating that these costs were current in 2006.

²¹⁴ EC (2007): Commission Staff Working Document – Small Clean and Competitive SEC(2007) 908, available at http://ec.europa.eu/environment/sme/pdf/doc_908_en.pdf

Table AF-1: Cost for Companies (assumed 2006)

Company size (employees)	Participation fee (Hackefors Model)	Cost of applying for certification (combined environmental and quality certification)
5	€3,100	€4,000
10	€5,100	€6,800
50	€16,900	€24,500

Source: EC (nd) Note: assumed current in 2006

Sources of funding

The Hackefors Model is operated by Altea AB on a commercial basis. Companies are charged a fee prior to certification and an annual fee after having obtained certification. Fees are calculated depending on the company's size. Post-certification fees provide companies with access to ongoing services, including four internal meetings with the coordinator, two internal audits, additional training, legal updates on the website and, optionally, legal compliance checks (EC, 2007).

EC (nd) notes that initially Hackefors Model received public funding but this was later withdrawn. This included a 50% government subsidy for training. When public funding was provided, 32 hours of training were provided to each enterprise. This was reduced to 16 hours when public funding was discontinued (EC, nd).

AF.5 Best practice examples

According to EC (2007), the main strengths of the Hackefors Model are as follows: network approach, cost savings for participants, encourages relationship building between companies and further cooperation in other areas. The Hackefors Model has been awarded several Swedish and international awards (Altea, nd a).

AF.6 Potential gains

The target audience are SMEs. In 2003, there were 485,000 SMEs in Sweden, most of which (454,000) were micro companies. This suggests that the take up of the Hackefors Model was approximately 0.12% (EC, nd). Although this programme has been developed in Sweden, its long-term goal is to reach SMEs throughout Europe (EC, nd).

AG. German Material Efficiency Agency [Deutsche Materialeffizienzagentur (Demea)] (Germany)

AG.1 Objectives

The German Material Efficiency Agency is part of the Federal Ministry for Economic Affairs and Energy [Bundesministerium für Wirtschaft und Energie - BMWi]. The goal of the agency

is to provide information on material efficiency and, with that, increasing public awareness in relation to the efficient handling of raw materials.

Companies shall be motivated to develop their material efficiency potential. This will be maintained through a support programme. In addition, the Ministry for Economic Affairs and Energy operates a pool of advisors who will support companies in identifying and developing the material efficiency potential.²¹⁵

AG.2 Programme structure and approach

Programme structure

The webpage of the Demea provides a link to the programme, 'Go-inno', which is located at the website of the BMWi. The webpage for 'Go-inno' indicates that the programme is divided into the two modules labelled 'Go-effizient [Go-efficient]' and 'Go-innovativ [Go-innovative]'.

The redirection to this external link could cause some confusion, as it does not seem to be linked with the Demea anymore, despite it still being so. However, when clicking on the link to the module which is relevant to the 'Go-efficient' study, the reader is then redirected back to the Demea webpage.

When selecting the 'Materialeffizienz' link on the Demea website, the reader is provided with articles on the topic, practical examples, and an article about the State Secretary who was awarded the German Raw Material Efficiency Prize 2013.

The articles themselves cover a broad range of topics about material efficiency, which supports the goal of the Demea to inform interested companies about material efficiency.

Information regarding support can be accessed via menu tabs in the header section of the website homepage. The first is labelled 'Support' [Förderung], which informs the interested company about the material efficiency module 'Go-effizient'. The other tabs are labelled 'Advisor Pool', 'Events', 'Service' and 'Press'.

With the 'Raw material and material efficiency' module, SMEs will be supported by external advisors who will be able to provide guidance in relation to the reduction of raw material and material usage.

The advice given consists of two different stages: potential analysis and in-depth advice. During the potential analysis stage a 'material-flow-analysis' will be conducted with adequate methods to determine the material loss, and a material-efficient product design or other measures will be advised. At the in-depth advice stage, the technical implementation of the assessed measures is focussed upon, which generates an in-depth analysis of the savings potential as well as advice for additional support measures.

²¹⁵ Deutsche Materialeffizienzagentur (2014): Beraten und Vernetzen, information downloaded from <http://www.demea.de/demea>

Support is provided via vouchers which cover 50% of the cost of the advice fees. The value of these vouchers amounts to a maximum of 17.000 € for a potential analysis and 80.000 € for the in-depth analysis (which, if the latter is claimed, the voucher value for the potential analysis would be deducted from the amount).

Services provided

Potential analysis

In-depth analysis

Duration of support

The first part of the potential analysis will cover eight advisory days and, if a third external advisor is necessary, an additional two days, but the entire potential analysis shall not exceed three months.²¹⁶

During the second part of the in-depth analysis, the development of a realisation concept is supported with up to 20 advisory days. For a third external advisor, an additional 5 days can be supported. Additional external project management can also be supported with up to 15 days. The overall length of the in-depth advice shall not exceed the time frame of a year.²¹⁷

Monitoring & evaluation

The advisory company will only receive the voucher as a payment after the proof for the usage of the voucher, with a positive outcome, has been provided.

To prove the advice has been provided to the company, documentation of the service provision has to be submitted within four weeks of the completion of the respective stage. This would be via a form that is provided by one of the granting authorities. The usage certificate is composed of a substantial (numbers) proof and a report that offers the chance to compare the planned advisory services with the realised advisory services.

AG.3 Results

Service uptake

The level of service uptake is unclear, but the BMWi website states that, so far, 1000 potential analysis have led to respectable results. This means that the average savings potential has been determined at € 200.000.²¹⁸

²¹⁶ Demea (2011): Richtlinie BMWi-Innovationsgutscheine (go-Inno), information downloaded from http://www.demea.de/foerderung/richtlinie_bmwinnovationsgutscheine_191211.pdf

²¹⁷ Ibid.

²¹⁸ Demea (2014): Können Sie Ihre Materialeffizienz verbessern?, information downloaded from <http://www.demea.de/selbstcheck>

Economic impacts

As indicated above, the average savings potential is determined at 200.000€. This potential depends on the project but one practical example is explained below.

The Holzwerke Heinrich Ströhla GmbH & Co. KG [wood works production] conducted a potential analysis of its sawing and processing works of wood products with the following result:

“The biggest possibility to a yield increase had been identified at the saw line through the optimization of the main and side products through an ICT-controlled process visualisation and timber-optimization. The waste when finger jointing through deficient timber could be reduced with a consistent control at the goods receiving. The efficiency gains achieved through the introduction of the material-flow-analysis based production management accounted for 1,8% of the turnover. The machine productivity could be increased by 1,6% and the work productivity by 3,4%.

The identified savings potential accounts for roughly 100.000 Euro per year. This required a one-time investment of 70.000 Euros which is amortised in about 8 month. Overall about 975 cubic meters of timber, planed timber and finger jointed wood can be saved annually.”²¹⁹

Social and environmental impacts

These depend on the project.

AG. 4 Costs

Expenditure

The BMWi spend in the field of innovation, technology and new mobility for the year 2013 amounted to a sum of 2.342.412 €, but it is unclear how much has been spent on Demea or on the innovation-vouchers from that budget.²²⁰ From the 2.342.412 € spent in the field of innovation, technology and mobility, 510.074 € are dedicated to innovation support and the central innovation programme SME.²²¹

²¹⁹ Demea (2014): Effizienzsteigerung in der Holzbearbeitung, information downloaded from <http://www.demea.de/materialeffizienz/praxisbeispiele/effizienzsteigerung-in-der-holzbearbeitung-1>

²²⁰ Bundesministerium für Wirtschaft und Energie (2014): Geplante Ausgaben des Bundesministeriums für Wirtschaft und Technologie in 2013, information downloaded from <http://www.bmwi.de/DE/Ministerium/haushalt,did=509952.html>

²²¹ Bundesministerium für Wirtschaft und Technologie (2012): Haushalt 2013, information downloaded from <http://www.bmwi.de/BMWi/Redaktion/PDF/H/haushalt-2013-tableau,property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf>

Sources of funding

The vouchers with which the company can pay for the advisory sessions are provided by the Ministry for Economic Affairs and Energy. Ultimately, the federal government of the Federal Republic of Germany, who allocates the budget for the respective legislative period, assigns the budget to the Ministry and, with it, the money for the Demea and the vouchers.²²²

²²² Bundesministerium für Wirtschaft und Energie (2014): Trotz vorläufiger Haushaltsführung: Grünes Licht für BMWi-Innovationsgutscheine, information downloaded from http://www.inno-beratung.de/go-inno/aktuelles/meldungen/20140207_Mittel-freigegeben.php

Annex 7: Sectoral breakdown of SMEs in the EU

Table A7-1: SMEs by Member State and sector

Member State	Total SMEs	Manufacturing	Construction	Admin & support	Transport and storage	Professional, Scientific and Technical	Accommodation and fod	Information & communication	Real etate	Water supply, sewerage, waste & recycling	Network energy supply	Mining & quarrying	Wholesale/retail trade; repair of motor vehicles & motorcycles
Austria	308,513	26,055	32,135	12,443	14,514	61,208	47,246	16,102	20,289	1,987	2,009	351	74,173
Belgium	526,234	37,748	89,595	30,044	16,519	96,162	50,347	21,923	32,309	1,258	259	264	149,806
Bulgaria	288,220	29,893	16,509	7,359	18,826	31,243	24,891	7,287	9,772	611	1,979	380	139,469
Croatia	151,761	22,282	20,966	6,073	10,315	19,938	18,316	5,539	6,322	651	183	295	40,880
Cyprus	42,440	4,233	5,104	1,292	2,935	4,690	6,433	764	607	166	4	72	16,141
Czech Republic	927,692	161,396	161,556	38,237	38,756	164,117	58,496	34,343	43,962	5,168	4,413	458	216,791
Denmark	212,963	16,046	34,506	15,374	13,104	30,682	13,768	13,170	25,514	3,359	1,576	203	45,660
Estonia	55,113	5,860	7,685	4,250	4,295	9,440	2,005	2,762	4,703	295	222	119	13,476
Finland	229,470	22,669	44,370	13,340	23,914	33,736	11,918	8,781	18,306	1,432	726	816	49,461
France	2,517,725	220,911	523,147	160,188	85,212	383,490	257,811	98,380	147,041	13,433	18,736	2,015	607,360
Germany	2,201,715	208,070	247,502	133,619	95,258	389,149	231,932	96,457	200,565	4,921	1,638	1,769	590,835
Greece	139,529	65,867	73,662	-	-	-	-	-	-	-	-	-	-
Hungary	557,687	53,920	67,086	40,087	31,331	110,787	32,847	39,910	35,512	1,729	528	429	143,520
Ireland	142,618	3,901	25,527	8,849	9,673	24,517	15,071	8,495	9,009	148	258	131	37,037
Italy	3,688,347	384,086	516,324	153,763	133,511	635,968	339,640	102,657	231,790	10,037	4,369	2,378	1,173,825
Latvia	73,909	9,749	6,038	3,347	5,178	10,948	3,082	2,653	11,333	315	345	214	20,707

Table A7-1: SMEs by Member State and sector

Member State	Total SMEs	Manufacturing	Construction	Admin & support	Transport and storage	Professional, Scientific and Technical	Accommodation and fod	Information & communication	Real etate	Water supply, sewerage, waste & recycling	Network energy supply	Mining & quarrying	Wholesale/retail trade; repair of motor vehicles & motorcycles
Lithuania	115,393	16,385	9,828	3,412	7,726	15,198	3,571	3,103	13,729	311	340	71	41,718
Luxembourg	30,433	748	3,562	1,463	750	7,386	3,128	2,307	3,598	59	62	11	7,359
Malta	27,304	2,264	2,918	1,458	1,851	4,837	2,097	729	1,278	102	0	57	9,714
Netherlands	681,047	47,821	118,640	39,223	27,739	160,670	38,964	42,604	22,947	1,199	583	300	180,358
Poland	1,541,341	202,907	238,589	41,066	140,556	206,690	50,614	48,817	49,207	5,466	2,233	2,017	553,179
Portugal	798,480	71,519	93,023	143,111	23,720	110,353	77,888	14,969	22,545	1,015	508	1,267	238,562
Romania	474,416	52,744	56,632	16,520	38,904	52,041	22,269	14,847	13,425	1,971	1,218	938	202,908
Slovakia	391,382	72,687	90,676	13,266	13,635	42,551	10,297	12,419	7,632	865	303	131	126,922
Slovenia	106,236	16,117	17,920	4,148	8,204	21,908	7,576	5,235	1,740	328	634	100	22,327
Spain	2,243,120	163,885	234,169	112,772	192,690	356,816	267,305	46,692	120,131	5,194	15,989	2,051	725,427
Sweden	672,401	56,627	95,744	34,750	29,980	173,915	28,296	61,130	55,518	1,419	2,242	908	131,871
UK	1,620,388	117,052	248,301	146,078	62,957	330,483	129,746	145,196	85,867	6,091	592	1,103	346,923
EU28	20,765,874	2,093,444	3,081,715	1,185,536	1,052,055	3,488,921	1,755,555	857,269	1,194,648	69,527	61,949	18,846	5,906,409

Note: EU28 sectoral figures do not include full array of SMEs in Greece due to missing data
Source: EU SME Performance Country data

Annex 8: Calculations of resource efficiency savings in Member States based on “pipeline” savings identified under the ENWORKS programme

Member State	Energy, power and utilities	Food and drink	Environmental technologies	Construction	Measures taken to save energy
Austria	644,222	724,391	100,861	147,993	80%
Belgium	786,646	884,539	123,159	180,711	68%
Bulgaria	501,679	564,110	78,544	115,248	41%
Croatia	412,841	464,217	64,636	94,840	64%
Cyprus	745,244	837,984	116,677	171,200	45%
Czech Republic	838,458	942,799	131,271	192,614	75%
Denmark	729,274	820,027	114,177	167,532	59%
Estonia	846,265	951,578	132,494	194,407	27%
Finland	850,879	956,765	133,216	195,467	70%
France	510,788	574,352	79,970	117,340	62%
Germany	713,423	802,204	111,695	163,890	74%
Greece	703,959	791,563	110,214	161,716	69%
Hungary	454,953	511,569	71,229	104,514	71%
Ireland	963,375	1,083,261	150,829	221,310	62%
Italy	566,149	636,602	88,638	130,058	44%
Latvia	295,732	332,533	46,301	67,937	73%
Lithuania	418,401	470,468	65,506	96,117	61%
Luxembourg	1,601,209	1,800,469	250,690	367,836	69%
Malta	439,457	494,145	68,803	100,954	76%
Netherlands	751,868	845,433	117,714	172,722	67%
Poland	617,251	694,064	96,638	141,797	64%
Portugal	465,836	523,807	72,933	107,014	90%
Romania	390,129	438,678	61,080	89,622	72%
Slovakia	548,996	617,315	85,952	126,118	74%
Slovenia	607,669	683,290	95,138	139,596	40%
Spain	569,697	640,592	89,193	130,873	91%
Sweden	434,962	489,090	68,099	99,921	59%
United Kingdom	636,533	715,745	99,657	146,227	79%

Member State	Energy, power and utilities	Food and drink	Environmental technologies	Construction	Measures taken to save energy
Austria	273	202	41	50	80%
Belgium	333	247	50	61	68%
Bulgaria	212	157	32	39	41%
Croatia	175	129	26	32	64%
Cyprus	315	234	47	58	45%
Czech Republic	355	263	53	66	75%

Table A8-2: Potential (pipeline) energy savings per business (tonnes/year) for SMEs

Member State	Energy, power and utilities	Food and drink	Environmental technologies	Construction	Measures taken to save energy
Denmark	309	229	46	57	59%
Estonia	358	265	54	66	27%
Finland	360	267	54	67	70%
France	216	160	32	40	62%
Germany	302	224	45	56	74%
Greece	298	221	45	55	69%
Hungary	193	143	29	36	71%
Ireland	408	302	61	75	62%
Italy	240	178	36	44	44%
Latvia	125	93	19	23	73%
Lithuania	177	131	27	33	61%
Luxembourg	678	502	102	125	69%
Malta	186	138	28	34	76%
Netherlands	318	236	48	59	67%
Poland	261	194	39	48	64%
Portugal	197	146	30	36	90%
Romania	165	122	25	30	72%
Slovakia	232	172	35	43	74%
Slovenia	257	191	39	48	40%
Spain	241	179	36	45	91%
Sweden	184	136	28	34	59%
United Kingdom	269	200	40	50	79%

Table A8-3: Potential (pipeline) savings from resource efficiency through resource reduction for SMEs (materials)

Member State	Average (2004-9) resource productivity (UK base)	Unit savings per business (tonnes/year)				Companies taking action in terms of material efficiency
		Energy, power and utilities	Food and drink	Environmental technologies	Construction	
Austria	0.5176	167	57	2	638	63%
Belgium	0.6734	217	74	3	830	62%
Bulgaria	0.2175	70	24	1	268	38%
Croatia	0.4280	138	47	2	527	44%
Cyprus	0.3514	113	39	2	433	34%
Czech Republic	0.4307	139	47	2	531	66%
Denmark	0.4481	144	49	2	552	45%
Estonia	0.2717	88	30	1	335	34%
Finland	0.3087	99	34	1	380	80%
France	0.7802	251	86	3	961	41%
Germany	0.7309	235	80	3	901	61%
Greece	0.5665	183	62	2	698	68%
Hungary	0.4136	133	46	2	510	53%
Ireland	0.3014	97	33	1	371	46%
Italy	0.7664	247	84	3	944	40%
Latvia	0.2800	90	31	1	345	61%
Lithuania	0.4464	144	49	2	550	55%

Table A8-3: Potential (pipeline) savings from resource efficiency through resource reduction for SMEs (materials)

Member State	Average (2004-9) resource productivity (UK base)	Unit savings per business (tonnes/year)				Companies taking action in terms of material efficiency
		Energy, power and utilities	Food and drink	Environmental technologies	Construction	
Luxembourg	1.0909	351	120	5	1,344	61%
Malta	1.8385	592	202	8	2,265	50%
Netherlands	1.1472	370	126	5	1,414	65%
Poland	0.3463	112	38	2	427	56%
Portugal	0.4078	131	45	2	503	85%
Romania	0.2155	69	24	1	266	60%
Slovakia	0.4642	150	51	2	572	77%
Slovenia	0.4265	137	47	2	526	27%
Spain	0.5234	169	58	2	645	91%
Sweden	0.5622	181	62	2	693	58%
United Kingdom	1	322	110	4	1,232	71%

Table A8-4: Potential savings from resource efficiency through resource reduction for SMEs (Water) per business (m³/year)

Member State	Constant 2005 US\$ GDP per cubic meter of total freshwater withdrawal (2007)	Ratio - UK base	Energy, power and utilities	Food and drink	Environmental technologies	Construction	SMEs taking measures for water efficiency
Austria	89.66	0.47	51	2,678	61	401	56%
Belgium	64.12	0.34	36	1,915	44	287	59%
Bulgaria	5.20	0.03	3	155	4	23	31%
Croatia	NA	NA	NA	NA	NA	NA	39%
Cyprus	86.14	0.45	49	2,573	59	385	38%
Czech Republic	86.62	0.46	49	2,587	59	387	56%
Denmark	474.81	2.50	267	14,181	325	2,123	33%
Estonia	9.16	0.05	5	274	6	41	13%
Finland	131.77	0.69	74	3,936	90	589	38%
France	70.82	0.37	40	2,115	48	317	54%
Germany	91.71	0.48	52	2,739	63	410	53%
Greece	27.69	0.15	16	827	19	124	54%
Hungary	20.53	0.11	12	613	14	92	52%
Ireland	285.00	1.50	161	8,512	195	1,274	43%
Italy	40.88	0.22	23	1,221	28	183	32%
Latvia	47.94	0.25	27	1,432	33	214	51%
Lithuania	12.93	0.07	7	386	9	58	50%
Luxembourg	699.39	3.68	394	20,888	479	3,127	49%
Malta	118.28	0.62	67	3,533	81	529	42%
Netherlands	59.86	0.32	34	1,788	41	268	27%
Poland	27.19	0.14	15	812	19	122	51%
Portugal	23.54	0.12	13	703	16	105	77%
Romania	13.42	0.07	8	401	9	60	57%
Slovak Republic	106.71	0.56	60	3,187	73	477	68%
Slovenia	43.63	0.23	25	1,303	30	195	32%
Spain	37.32	0.20	21	1,115	26	167	78%
Sweden	152.64	0.80	86	4,559	104	682	29%
UK	189.92	1.00	107	5,672	130	849	63%

Table A8-5²²³: Potential (pipeline) savings from diverting waste from landfill

Unit savings per business (tonnes/year)	Municipal recycling index (UK base)	Energy, power and utilities	Food and drink	Environmental technologies	Construction	Rate of recycling
Austria	2.0368	1147	231	473	753	60%
Belgium	1.8369	1034	208	426	679	43%
Bulgaria ¹	NA	NA	NA	NA	NA	20%
Croatia	0.0394	22	4	9	15	39%
Cyprus	0.1578	89	18	37	58	39%
Czech Republic	0.2647	149	30	61	98	49%
Denmark	1.2253	690	139	284	453	22%
Estonia	0.7219	406	82	167	267	14%
Finland	1.1410	642	129	265	422	41%
France	1.0328	581	117	240	382	41%
Germany	2.0481	1153	232	475	757	57%
Greece	0.4846	273	55	112	179	45%
Hungary	0.3951	222	45	92	146	20%
Ireland	1.0742	605	122	249	397	81%
Italy	0.6651	374	75	154	246	40%
Latvia	0.1564	88	18	36	58	23%
Lithuania	0.1451	82	16	34	54	19%
Luxembourg	1.4686	827	166	341	543	52%
Malta	0.3890	219	44	90	144	44%
Netherlands ²	1.6464	NA	NA	NA	NA	55%
Poland	0.2380	134	27	55	88	28%
Portugal	0.5281	297	60	123	195	78%
Romania	0.0314	18	4	7	12	32%
Slovakia	0.1658	93	19	38	61	52%
Slovenia	0.6364	358	72	148	235	19%
Spain	1.0949	616	124	254	405	78%
Sweden	1.5922	896	180	369	588	56%
United Kingdom	1	563	113	232	369	83%

¹ Data not available

² Landfilling is not permitted in The Netherlands

²²³ Source: The data in Tables A1-1 to A1-5 is extrapolated based on data provided in Tables A5-A13, pp.8-17 in the publication "POTENTIAL FOR RESOURCE EFFICIENCY SAVINGS FOR BUSINESSES" UK Department for Business Innovation and Skills (<http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-698-potential-resource-efficiency-savings-for-businesses>) March 2010. Research was carried out in February to March 2009.

Annex 9: Consultation under Task 3

Under Task 3, consultation was undertaken to try to fill data gaps, for example, where expenditure data did not appear to be available for a particular year or category. Information on jobs related to environmental expenditure was also sought. Table 9-1 provides a summary of the consultation undertaken with Member States to try to fill data gaps on expenditure and jobs.

Table A9-1: Summary of consultation undertaken with Member States in relation to environmental expenditure and jobs			
Member State	Number of initial emails sent	Responses received	Further action necessary?
Austria	2	1	No
Belgium	1	1	No
Bulgaria	1	0	Yes, further email sent on 20/12/2013. Response received
Croatia	1	1	No
Cyprus	1	0	Yes, follow up email sent on 20/12/2013. Response received
Czech Republic	1	1	No
Denmark	1	1	No
Estonia	1	0	Yes, further email sent to different contact on 20/12/2013. Response received
Finland	1	1	No
France	1	1	No
Germany	1	0	Yes, further contact made through statistical website on 20/12/2013. Response received
Greece	1	0	Yes, further email sent to additional contact on 20/12/2013. No response received
Hungary	1	1	Yes, advised to wait until data was released in mid-December
Ireland	2	1	No
Italy	2	1	No
Latvia	1	0	Yes, further email sent on 20/12/2013. No response received
Lithuania	1	1	No
Luxembourg	1	1	No
Malta	1	1	No
Netherlands	1	1	No
Poland	1	0	Yes, further email sent on 20/12/2013. Response received on 23/12/2013
Portugal	1	0	Yes, further contact made through statistical website on 20/12/2013. Response received
Romania	1	1	No
Slovakia	1	1	No

Table A9-1: Summary of consultation undertaken with Member States in relation to environmental expenditure and jobs

Member State	Number of initial emails sent	Responses received	Further action necessary?
Slovenia	1	1	No
Spain	1	1	No
Sweden	1	1	No
UK	3	3	No

For the objective on funding, there is a considerable amount of project level information on environment related EU funding publically available on the Internet. However, for several sources of funding, summary data were difficult to identify. Thus, consultation was used to try to identify total amounts of funding received by different Member States. A summary of the emails sent and responses received is provided in Table A9-2. Note that due to the limited time frame for the study, missing responses on funding were not followed up.

Table A9-2: Summary of consultation undertaken on environment related EU funding

Member State/ Organisation/ Funding programme	Emails sent	Responses received
Cordis	1	1
Life+ funding	1	1
Europe Direct	1	1
Austria	1	1
Belgium	3	0
Bulgaria	2	0
Croatia	1	0
Cyprus	1	1
Czech Republic	1	0
Denmark	2	2
Estonia	1	0
Finland	2	0
France	2	0
Germany	2	1
Greece	2	0
Hungary	1	0
Ireland	2	1
Italy	2	1
Latvia	1	1
Lithuania	1	0
Luxembourg	1	0
Malta	1	1
Netherlands	1	0
Poland	2	0
Portugal	2	1
Romania	3	0
Slovakia	1	0
Slovenia	1	0
Spain	2	1
Sweden	3	1
UK	2	2

Annex 10: Regional data on environmental protection expenditure

For several Member States, DG ESTAT holds data on environmental expenditure at regional or other level. The following list identifies those Member States and specifies the table number where the data are reported.

- Bulgaria: Table A10-1 provides regional level data on environmental expenditure by general government and industry for 2008 to 2011
- Croatia: Table A10-2 presents data on environmental expenditure by general government and industry in the three former statistical regions²²⁴ for 2008 to 2011;
- Czech Republic: Table A10-3 shows regional level data on environmental expenditure by general government and industry for 2008 to 2011
- Italy: Table A10-4 provides environmental expenditure data for general government by region for 2008 to 2010
- Portugal: Table A10-5 presents environmental expenditure data for general government and industry for seven regions (including the Azores and Madeira) for 2008 to 2011
- Romania: Table A10-6 shows environmental expenditure data for general government and industry for eight regions for 2008 to 2011
- Slovakia – Table A10-7 presents environmental expenditure data for general government and industry for four regions for 2008 to 2011
- Spain – Table A10-8 provides environmental expenditure data for industry for 18 regions including the Canaries for 2008 to 2011.

Table A10-1: Regional environmental protection expenditure in Bulgaria (millions of Euros)								
Region	Public environmental expenditure				Private environmental expenditure			
	2008	2009	2010	2011	2008	2009	2010	2011
Severozapaden	20	13	14	21	37	64	86	53
Severen tsentralen	23	18	20	21	15	9.3	4.8	5.3
Severoiztochen	20	34	24	47	28	21	17	7.1
Yugoiztochen	32	44	31	40	94	106	70	120
Yugozapaden	50	53	50	54	180	57	85	57
Yuzhen tsentralen	64	62	46	48	39	14	24	22
Totals	209	224	184	231	393	270	287	265

Source: data extracted from DG ESTAT database on environmental protection expenditure by NUTS 2 regions (env_ac_exp4r2), accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_EX_P4R2 on 22 January 2014.

Notes: Public data represent expenditure by general government, whilst private data represent expenditure by industry with the exception of construction, sewerage, waste management and remediation activities

²²⁴ Note that the revised NUTS 2 division which has been in place since 2012 only divides Croatia into two regions.

Table A10-2: Regional environmental protection expenditure in Croatia (millions of Euros)								
Region	Public environmental expenditure				Private environmental expenditure			
	2008	2009	2010	2011	2008	2009	2010	2011
Jadranska Hrvatska	2.4	1.2	2.5	2.2	61	56	40	49
Sjeverozapadna Hrvatska (former statistical region)	7.0	9.3	30	133	264	287	267	187
Sredisnja i Istocna (Panonska) Hrvatska (former statistical region)	0.75	0.55	0.63	7.5	38	39	27	116
Totals	10	11	33	143	364	382	335	352

Source: data extracted from DG ESTAT database on environmental protection expenditure by NUTS 2 regions (env_ac_exp4r2) accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_EX_P4R2 on 23 January 2014.

Notes: Public data represent expenditure by general government, whilst private data represent expenditure by industry with the exception of construction, sewerage, waste management and remediation activities

Table A10-3: Regional environmental protection expenditure in the Czech Republic (millions of Euros)								
Region	Public environmental expenditure				Private environmental expenditure			
	2008	2009	2010	2011	2008	2009	2010	2011
Praha	83	99	163	129	120	162	148	143
Strední Cechy	66	73	103	89	178	119	151	179
Jihozápad	84	82	73	102	87	116	111	111
Severozápad	50	46	43	56	169	141	185	200
Severovýchod	52	56	85	90	235	222	219	251
Jihovýchod	99	116	149	134	122	102	92	91
Strední Morava	53	67	84	84	104	89	112	109
Moravskoslezsko	57	69	73	112	190	166	178	248
Totals	542	610	774	795	1,205	1,118	1,195	1,331

Source: data extracted from DG ESTAT database on environmental protection expenditure by NUTS 2 regions (env_ac_exp4r2) accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_EX_P4R2 on 23 January 2014.

Notes: Public data represent expenditure by general government, whilst private data represent expenditure by industry with the exception of construction, sewerage, waste management and remediation activities

Table A10-4: Regional environmental protection expenditure in Italy (millions of Euros)			
Region	Public environmental expenditure		
	2008	2009	2010
Piemonte	2,893.04	2,855.88	2,397.05
Valle d'Aosta/Vallée d'Aoste	145.80	139.98	104.90
Liguria	45.79	44.98	39.83
Lombardia	65.80	55.89	61.89
Provincia Autonoma di Bolzano/Bozen	176.98	183.14	235.19

Table A10-4: Regional environmental protection expenditure in Italy (millions of Euros)			
Region	Public environmental expenditure		
	2008	2009	2010
Provincia Autonoma di Trento	65	69	69
Veneto	116	126	97
Friuli-Venezia Giulia	178	181	174
Emilia-Romagna	80	62	60
Toscana	47	53	51
Umbria	79	117	114
Marche	40	37	32
Lazio	59	51	48
Abruzzo	218	226	263
Molise	26	27	35
Campania	19	20	16
Puglia	390	456	224
Basilicata	222	208	146
Calabria	67	80	83
Sicilia	163	168	146
Sardegna	430	351	226
Totals	1,891	1,964	2,223

Source: data extracted from DG ESTAT database on environmental protection expenditure by NUTS 2 regions (env_ac_exp4r2) accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_EXP4R2 on 23 January 2014.

Notes: Public data represent expenditure by general government

Table A10-5: Regional environmental protection expenditure in Portugal (millions of Euros)								
Region	Public environmental expenditure				Private environmental expenditure			
	2008	2009	2010	2011	2008	2009	2010	2011
Norte	187	193	167	158	82	66	81	80
Algarve	61	68	47	50	2.2	5.1	2.8	2.6
Centro (PT)	151	155	106	112	110	82	70	91
Lisboa	242	269	243	230	228	231	209	188
Alentejo	57	56	43	40	24	24	32	24
Região Autónoma dos Açores (PT)	51	45	46	42	5.6	5.3	4.4	5.6
Região Autónoma da Madeira (PT)	77	54	106	82	3.2	5.9	4.0	3.6
Totals	826	838	759	714	455	420	403	395

Source: data extracted from DG ESTAT database on environmental protection expenditure by NUTS 2 regions (env_ac_exp4r2) accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_EXP4R2 on 23 January 2014.

Notes: Public data represent expenditure by general government, whilst private data represent expenditure by industry with the exception of construction, sewerage, waste management and remediation activities

Table A10-6: Regional environmental protection expenditure in Romania (millions of Euros)								
Region	Public environmental expenditure				Private environmental expenditure			
	2008	2009	2010	2011	2008	2009	2010	2011
Nord-Vest	61	67	70	98	42	45	40	53
Centru	73	50	48	87	142	98	75	59
Nord-Est	58	74	63	105	48	39	28	37
Sud-Est	81	66	60	75	75	51	53	54
Sud - Muntenia	40	44	42	66	77	74	57	56
Bucuresti - Ilfov	155	119	104	130	517	256	263	297
Sud-Vest Oltenia	30	13	14	39	111	185	281	79
Vest	38	34	63	77	81	68	216	364
Totals	537	468	463	677	1,094	817	1,013	999

Source: data extracted from DG ESTAT database on environmental protection expenditure by NUTS 2 regions (env_ac_exp4r2) accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_EX_P4R2 on 23 January 2014.

Notes: Public data represent expenditure by general government, whilst private data represent expenditure by industry with the exception of construction, sewerage, waste management and remediation activities

Table A10-7: Regional environmental protection expenditure in Slovakia (millions of Euros)								
Region	Public environmental expenditure				Private environmental expenditure			
	2008	2009	2010	2011	2008	2009	2010	2011
Bratislavský kraj	27	27	31	28	129	103	92	115
Západné Slovensko	58	63	71	83	110	109	78	90
Stredné Slovensko	33	42	45	51	112	91	86	109
Východné Slovensko	37	37	40	52	75	82	147	66
Totals	156	169	187	214	425	384	403	379

Source: data extracted from DG ESTAT database on environmental protection expenditure by NUTS 2 regions (env_ac_exp4r2) accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_EX_P4R2 on 23 January 2014.

Notes: Public data represent expenditure by general government, whilst private data represent expenditure by industry with the exception of construction, sewerage, waste management and remediation activities

Table A10-8: Regional environmental protection expenditure in Spain (millions of Euros)				
Region	Private environmental expenditure			
	2008	2009	2010	2011
Galicia	131	116	148	179
Principado de Asturias	102	86	101	129
Cantabria	29	22	29	36
País Vasco	175	183	198	212
Comunidad Foral de Navarra	51	54	59	62
La Rioja	17	15	17	18
Aragón	57	63	66	71

Table A10-8: Regional environmental protection expenditure in Spain (millions of Euros)				
Region	Private environmental expenditure			
	2008	2009	2010	2011
Comunidad de Madrid	119	116	130	143
Castilla y León	148	154	185	165
Castilla-la Mancha	51	68	92	101
Extremadura	14	13	15	15
Cataluña	482	529	581	601
Comunidad Valenciana	183	199	215	224
Illes Balears	6.3	4.4	8.6	21
Andalucía	231	236	261	273
Región de Murcia	65	71	72	73
Ciudad Autónoma de Ceuta (ES)	0.3	0.3	0.7	0.7
Canarias (ES)	31	34	47	37
Totals	1,891	1,964	2,223	2,361

Source: data extracted from DG ESTAT database on environmental protection expenditure by NUTS 2 regions (env_ac_exp4r2) accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_EX_P4R2 on 23 January 2014.

Notes: Private data represent expenditure by industry only with the exception of construction, sewerage, waste management and remediation activities

For several other Member States, national data on regional or lower level environmental expenditure is available through statistics authorities. Data have been identified for the following Member States:

- Estonia: public environmental protection expenditure are available by municipal government. Table A10-9
- France: industry data are available for French regions for 2011 in Table A10-10;
- Poland – Table A10-11 provides regional data for outlays on fixed assets
- Slovenia – some regional data are available for industry in Table A10-12.

Table A10-9: Environmental protection expenditure by city and rural municipality governments in Estonia				
County	Expenditure (€ millions)			
	2008	2009	2010	2011
Harju	6.2	4.3	4.3	24
Hiiu	0.23	0.31	0.17	0.071
Ida-Viru	1.8	2.2	2.5	2.8
Jõgeva	0.48	0.26	0.35	1.1
Järva	1.5	13	0.49	4.0
Lääne	0.75	0.45	0.37	0.18
Lääne-Viru	1.9	1.1	0.91	1.5
Põlva	0.44	0.35	0.39	0.65
Pärnu	2.3	1.2	1.2	5.6
Rapla	2.0	1.6	0.85	2.3

Table A10-9: Environmental protection expenditure by city and rural municipality governments in Estonia

County	Expenditure (€ millions)			
	2008	2009	2010	2011
Saare	1.8	13	5.9	1.8
Tartu	2.1	1.7	3.2	2.4
Valga	1.3	0.87	1.1	1.2
Viljandi	1.3	0.27	0.81	1.3
Võru	1.7	0.40	0.66	2.0

Source: Statistics Estonia, accessed at: <http://www.stat.ee/environmental-protection-and-supervision> on 24 January 2014

Table A10-10: Specific and integrated investment for environmental protection by industry by region in France for 2011

Region	Specific investment by industry 2011 (€ millions)	Integrated investment by industry 2011 (€ millions)
Île-de-France et DOM (overseas departments and territories)	130.7	37.7
Champagne-Ardenne	32.1	9.2
Picardie	37.5	14.2
Haute-Normandie	47.9	11.4
Centre	34.9	12.6
Basse-Normandie	23.7	3.5
Bourgogne	23.8	5.3
Nord-Pas-de-Calais	74.6	12.9
Lorraine	46.5	10.7
Alsace	37.3	6.7
Franche-Comté	21.4	5.0
Pays de la Loire	47.9	14.8
Bretagne	38.0	9.5
Poitou-Charentes	23.5	3.3
Aquitaine	46.5	6.5
Midi-Pyrénées	44.6	4.7
Limousin	7.2	1.3
Rhône-Alpes	138.1	20.4
Auvergne	23.10	8.8
Languedoc-Roussillon	28.10	8.1
Provence-Alpes-Côte d'Azur et Corse (Corsica)	96.0	22.8

Source: Insee, SSP, Enquête annuelle sur les investissements pour protéger l'environnement (Antipol) en 2011, accessed at: http://www.insee.fr/fr/themes/document.asp?ref_id=antipol11 on 24 January 2014

Table A10-11: Regional environmental protection expenditure for Poland

Region	Outlays on fixed assets serving environmental protection (€ millions)				
	2008	2009	2010	2011	2012
Central region	574	545	518	699	520
Southern region	633	736	522	559	517
Eastern region	263	234	468	507	480
North-western region	413	361	536	516	334

Table A10-11: Regional environmental protection expenditure for Poland					
Region	Outlays on fixed assets serving environmental protection (€ millions)				
	2008	2009	2010	2011	2012
South-western region	274	252	258	266	232
Northern region	273	338	434	402	337

Source: Local Data Bank of the Central Statistical Office, Poland, accessed at: http://www.stat.gov.pl/bdlen/app/strona.html?p_name=indeks on 24 January 2014.

Notes: data include municipal wastewater, industrial wastewater, industrial atmospheric pollutant emissions, municipal waste, industrial waste, consumption of water, nature and landscape protection, and generally accessible and estate area green belts

Table A10-12: Environmental protection expenditure by region for Slovenia				
County	Gross fixed capital formation for environmental protection (€ millions)			
	2008	2009	2010	2011
Pomurska	12	6.1	150	4.7
Podravska	20	11.3	36	16
Koroška	12	6.1	4.0	23
Savinjska	115	79	98	120
Zasavska	5.1	3.5	6.8	4.6
Spodnje-posavska	11	30	1.3	0.54
Jugovzhodna Slovenia	11	43	4.2	2.9
Osrednjeslovenska	93	72	77	83
Gorenjska	25	29	16	17
Notranjsko-kraška	3.6	2.7	1.4	2.0
Goriška	17	17	3.6	3.3
Obalno-kraška	23	34	10	4.2

Source: Statistical Office of the Republic of Slovenia, accessed at: <http://pxweb.stat.si/pxweb/Database/Environment/Environment.asp#27> on 24 January 2014.

Notes: data relate to activities within NACE 36 (water collection, treatment and supply), 37 (sewerage), 38 (waste collection, treatment and disposal activities; materials recovery) and 39 (remediation activities and other waste management services)



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