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Environmental Goods and Services Sector Accounts (2014-2015)

In 2015, the environmental goods and services sector generated 2.8% of the national GVA

In 2015, the environmental goods and services sector accounted for 2.8% of the GVA of the economy, 3.3% of exports and 2.3% of employment, presenting a higher growth than the national economy in the main economic variables analyzed, such as GVA (5.5% vs. 3.6%) and Exports (13.1% vs. 4.7%). The environmental domains that contributed most to this sector GVA were management of energy resources (35.7%), waste management (16.9%) and management of water (14.3%).

In 2014 the relative weight of the environmental goods and services sector GVA in the national GVA was 2.7%, higher than the EU28 (2.3%).

In 2015, the National Expenditure on Environmental Protection (NEEP) amounted 2,510.2 M€ (1.4% of GDP).

For the first time, Statistics Portugal publishes the Environmental Goods and Services Sector Accounts (EGSS), presenting results for 2014 and 2015, based on the final National Accounts available for those years.

This press release summarizes the EGSS results by environmental domain and branch of economic activity. In addition, the main data on the Environmental Protection Expenditure Accounts (EPEA) (an additional module of the European Environment Accounts) are published. At the end, methodological notes are presented on both projects, with mandatory transmission, from 2017 onwards, to comply with Regulation (EU) No. 538/2014.

Additional tables with more detailed information are available at Statistics Portugal website, in the area of dissemination of the National Accounts (Satellite Accounts section).

1. Environmental Goods and Services Sector Accounts (EGSS)

This sector comprises the goods and services produced for the purpose of environmental protection and resource management. Environmental protection includes all activities and actions whose main purpose is prevention, reduction and elimination of pollution, as well as any other degradation of the environment (see Table A.1 of the methodological notes). Resource management includes the preservation, maintenance and strengthening of existing natural resources and therefore seeks to combat their decline and prevent their depletion.

1.1. Main results

In 2015 the environmental goods and services sector:

- Produced 11,495 M€ (3.6% of national production);
- Generated 4,377 M€ of Gross Value Added (GVA) (2.8% of the national economy);
- Exported 2,433 M€ (3.3% of national exports);
- Employed 99,564 Full Time Equivalents – FTE¹ (2.3% of national employment);
- Registered higher growth rates than the national economy in all observed variables.

Table 1: Main results of Environmental Goods and Services Sector Accounts

		2014	2015	Rate of variation 2014/2015 (%)
Environmental goods and services sector output	10 ⁶ euros	10,930	11,495	5.2
<i>Economy output</i>		310,198	318,314	2.6
Weight in the national economy		3.5%	3.6%	
Environmental goods and services sector GVA	10 ⁶ euros	4,149	4,377	5.5
<i>Economy GVA</i>		151,365	156,839	3.6
Weight in the national economy		2.7%	2.8%	
Environmental goods and services sector exports	10 ⁶ euros	2,152	2,433	13.1
<i>Economy exports</i>		69,360	72,648	4.7
Weight in the national economy		3.1%	3.3%	
Environmental goods and services sector employment	FTE	91,812	99,564	8.4
<i>Economy employment</i>		4,246,668	4,327,478	1.9
Weight in the national economy		2.2%	2.3%	

FTE – Full-time Equivalent

1.2. Results by environmental domain

Environmental goods and services are grouped into two classifications:

- Environmental protection (CEPA) - technologies, goods and services that reduce or prevent the amounts of harmful materials that damage the environment;
- Resource management (CReMA) - technologies, goods and services that manage and conserve natural resources.

Both classifications include activities related to monitoring the quality of the environment, Research and Development (R&D), General Government, and training and education related to environmental protection and resource management.

¹ FTE is obtained by the ratio of total hours worked to the annual average hours worked in full-time jobs.

In 2015 the production of environmental protection goods and services amounted 3,836 M€ and the resource management was 7,659 M€.

Chart 1: Output by environmental group (2015)

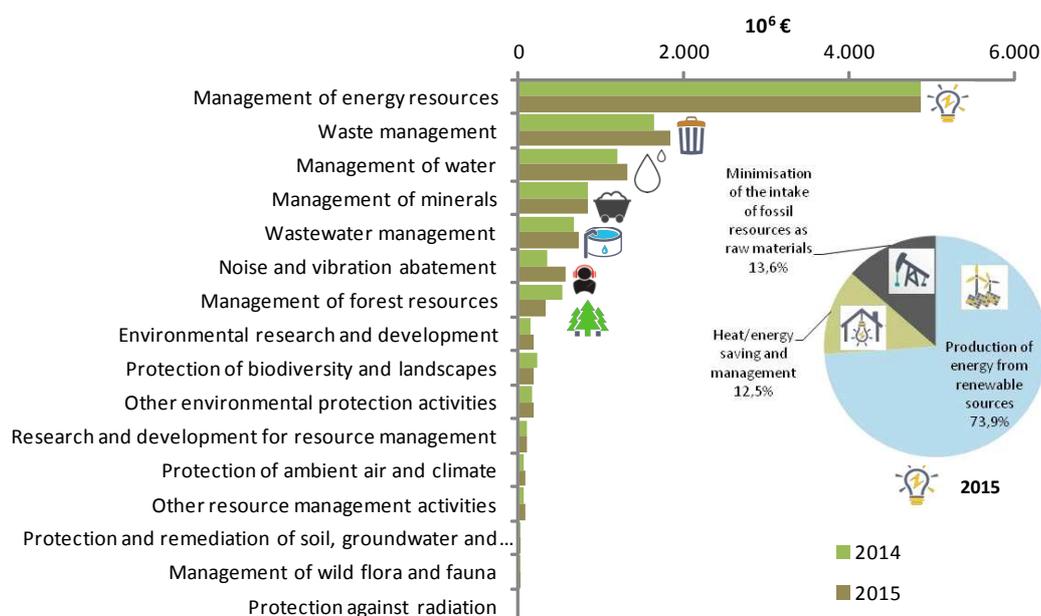


In a more detailed analysis, it is possible to conclude that in 2015 the management of energy resources was the most relevant domain (42.9% of the total production of environmental goods and services). It

should be noted that this domain comprises three sub domains: the production of energy from renewable sources (74.0% from the total), the heat/energy saving and management (12.5%) and the minimization of the intake of fossil resources as raw material (13.6%). Waste management was the second most important area (16.1% of the production of environmental goods and services), followed by management of water (11.4%).

Between 2014 and 2015 the production of the resource management group increased by 0.2%, while the environmental protection increased by 17.7%. This significant increase was mainly due to a strong growth in production in waste management and noise and vibration abatement domains (driven by a strong increase in exports of automotive silencers).

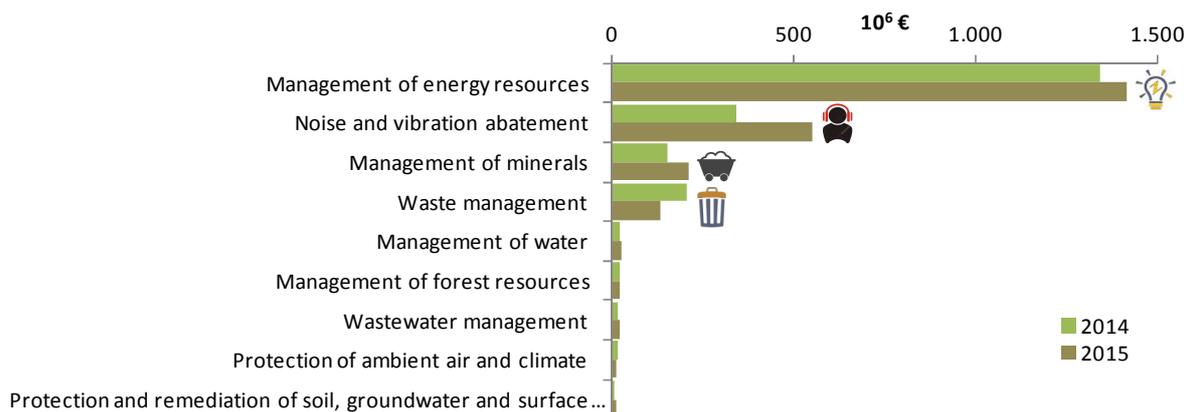
Chart 2: Output by environmental domains (2014 and 2015)



In 2015, 21.2% of the production of environmental goods and services was directed to exports. The area of energy resources management accounted for 58.2% of

these exports. It is also worth mention the noise and vibration abatement (22.8%) and management of minerals (9.5%), namely scrap exports.

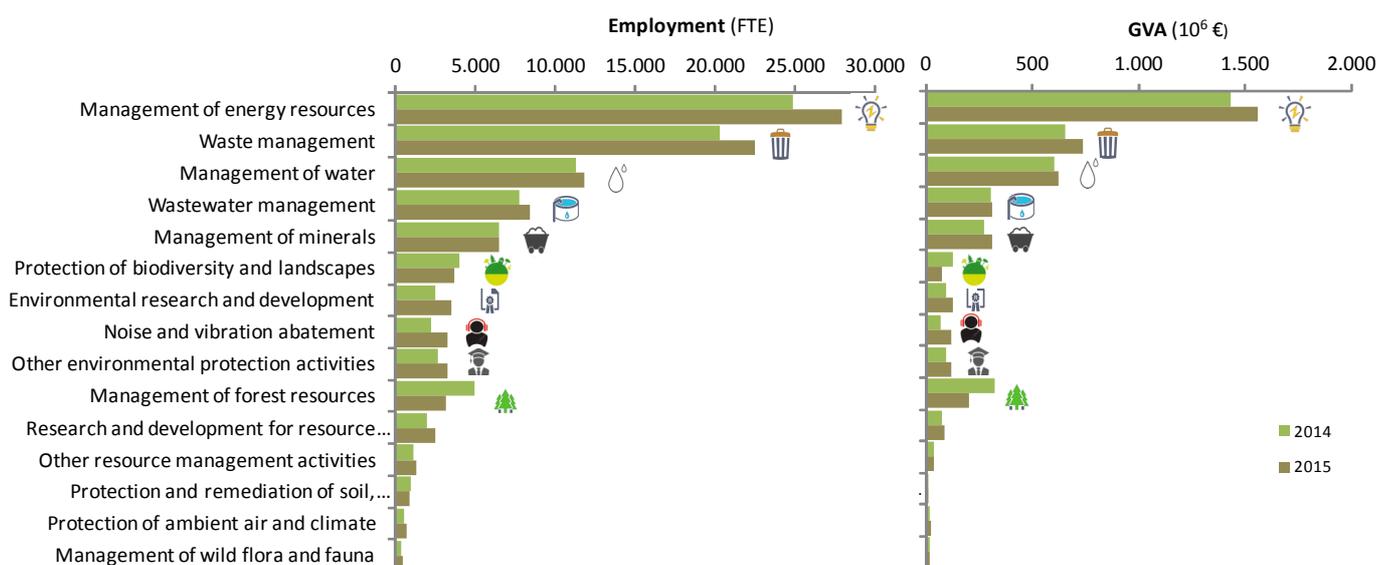
Chart 3: Exports by environmental domains (2014 and 2015)



In 2015, the environmental domains that contributed most to GVA were the management of energy resources (35.7%), the waste management (16.9%) and the management of water (14.3%). The hierarchy of activities in terms of employment was similar: the

management of energy resources (28.0%) was the most relevant, although not as distant from waste management (22.6%), followed by management of water (11.9%).

Chart 4: Employment and GVA by environmental domains (2014 and 2015)



1.3. Results by industry

The GVA in environmental goods and services is generated by multiple branches (by NACE) of economic activity. In 2015, the activity with the greatest relative importance was the Water supply; sewerage, waste

management and remediation activities (NACE E), responsible for 36.6% of total GVA. Manufacturing (NACE C) came in second place (26.6%) and Electricity, gas, steam and air conditioning supply (NACE D) in third place (15.0%).

Chart 5: GVA by NACE activity (2015)

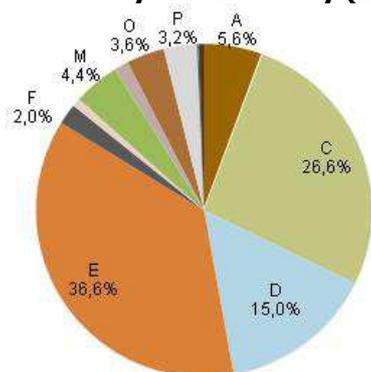
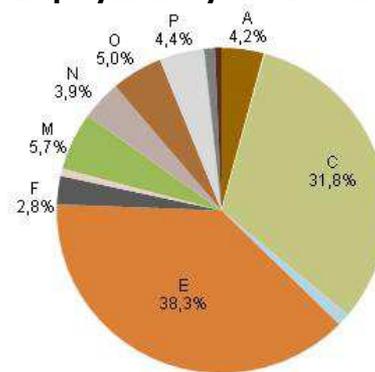


Chart 6: Employment by NACE activity (2015)



Employment was distributed with an identical hierarchy, but with different relative weights: Water supply; sewerage, waste management and remediation activities (NACE E) and manufacturing (NACE C) had very close holdings (38.3% and 31.8%, respectively). The Electricity, gas, steam and air conditioning supply (NACE D) contributed only 1.2% to total employment, since it is an intensive capital activity.

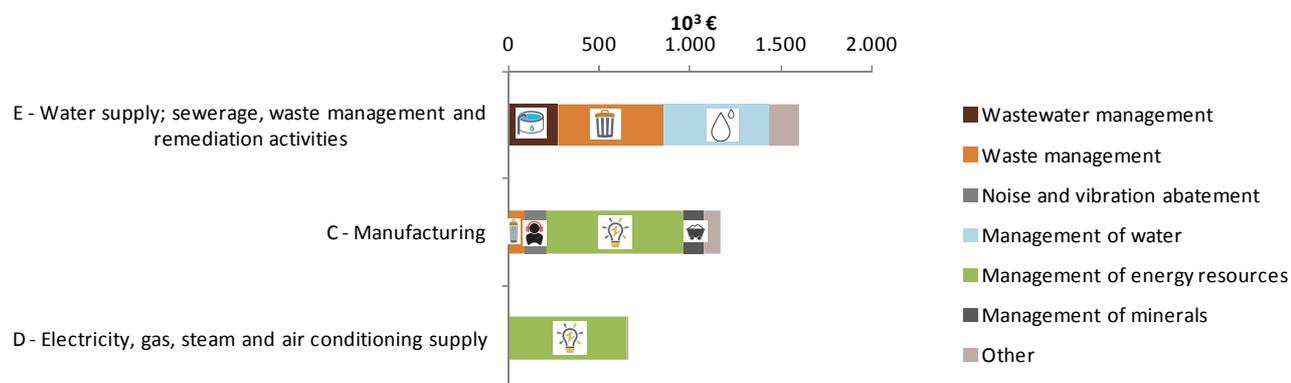
management (36.3%), management of water (36.0%) and wastewater management (17.3%).

Crossing the information of the NACE breakdown activities and the environmental domains it is possible to conclude that the GVA of the Water supply; sewerage, waste management and remediation activities (NACE E) came mainly from waste

The manufacturing GVA (NACE C), under EGSS, was generated mainly by the management of energy resources (64.8%), which is subdivided into the sub-domains of production of energy from renewable sources (35.3%), heat/energy saving and management (15.3%) and minimization of the intake of fossil resources as raw material (14.2%).

The GVA of Electricity, gas, steam and air conditioning supply (NACE D) originated exclusively in the management of energy resources, more specifically the production of energy from renewable sources.

Gráfico 7: VAB dos três principais ramos de atividade, por domínios (2015)



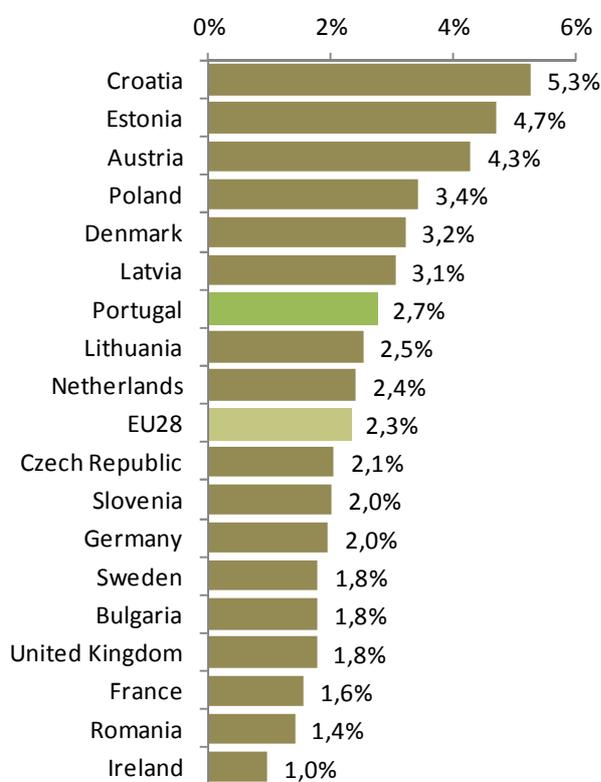
1.4. International comparisons

Having as reference the year 2014, since it is the last one with information available for more countries, it can be seen that Portugal registered a relative weight of GVA for Environmental Goods and Services in the national GVA of 2.7%, higher than that of the EU28 (2.3%).

2017 was the first year of compulsory reporting to Eurostat, so comparisons with the results of other countries should be carried out with some caution for two fundamental reasons:

- (i) Not all data presented originate from Satellite Accounts, based on information from the National Accounts, in accordance with the ESA 2010. Some values have resulted from the appropriation of surveys;
- (ii) There is no total harmonization in the type of goods and services and units considered in the perimeter of EGSS (namely the Water supply; sewerage, waste management and remediation activities and the production of electricity from renewable energy sources).

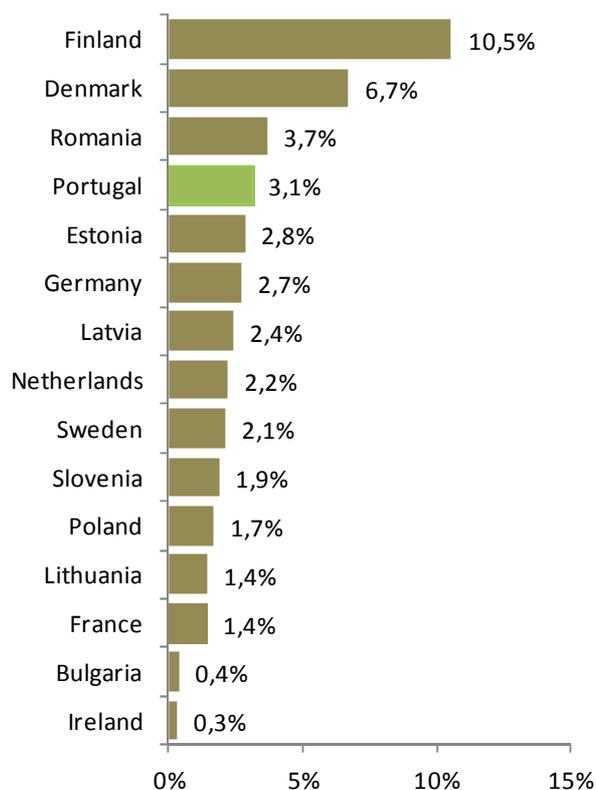
Chart 8: Weight (%) of the GVA of the environmental goods and services sector in Europe (2014)



Sources: The information for Portugal comes from EGSS. Information from other Member States was extracted from the Eurostat database (<http://ec.europa.eu/eurostat/data/database>) on 30th January 2017.

The number of countries with information available for exports is significantly lower. In 2014 Portugal presented the fourth highest register (3.1%). Finland was the country with the highest relative importance of these exports (10.5%).

Chart 9: Weight (%) of exports of the environmental goods and services sector in European countries (2014)



Sources: The information for Portugal comes from CSBSA. Information from the other Member States was extracted from the Eurostat database (<http://ec.europa.eu/eurostat/data/database>) on 30 January 2017.

2. Environmental Protection Expenditure Accounts (EPEA)

These accounts refer to 2014 and 2015. EPEA are related to EGSS, but:

- Limit the areas of observation to environmental protection (CEPA classification);
- They predominantly focus on the share of specific environmental products that corresponds to specific environmental protection services, called EP services. These relate essentially to waste management and wastewater management (see methodological notes);
- Do not detail information on activities by NACE;
- Extend the number of estimated variables;
- Detail most of the variables by institutional sector.

National Expenditure on Environmental Protection (NEEP) is the final variable estimated by this Account, and corresponds to the algorithm:

$$\begin{aligned}
 & \text{NEEP} \\
 & = \text{final consumption expenditure} \\
 & + \text{intermediate consumption} \\
 & + \text{investment}^1 \\
 & + \text{current and capital transfers from the Rest of the World} \\
 & - \text{current and capital transfers to the Rest of the World}
 \end{aligned}$$

¹ Gross Fixed Capital Formation (GFCF) + acquisitions net of disposals of non-produced assets (NP)

2.1. Main results

In 2015, environmental protection services were characterized by:

- A final consumption expenditure of 797.2 M€, representing 0.5% of household final consumption expenditure;
- Intermediate consumption of 1,109.7 M€ (0.7% of national intermediate consumption);
- An *investment* (for the production of environmental protection services) of 805.2 M€, corresponding to 2.9% of the national economy *investment*;
- NEEP totaled 2,510.2 M€ (corresponding to 1.4% of national GDP). This value had an inherent production of 2,952.5 M€ (0.9% of national production).

Between 2014 and 2015, there was a decrease of 3.6% in the NEEP, highlighting:

- An increase in final consumption expenditure by 2.2%, lower than the 2.8% registered by the national economy;
- A near stabilization of intermediate consumption (+0.1%), while that of the national economy grew by 1.7%;
- *Investment* growth of 5.5%, less pronounced than the 7.1% in the country;
- Production increased by 11.6%, compared to 2.6% of domestic production.

Table 2: Main results of the Environmental Protection Expenditure Accounts (2014 and 2015)

		2014	2015	Rate of variation 2014/2015 (%)
National expenditure of EP	10 ⁶ euros	2,604.9	2,510.2	-3.6
Final consumption expenditure of EP services		779.7	797.2	2.2
<i>Final consumption expenditure in the national economy</i>	10 ⁶ euros	146,265.6	150,310.6	2.8
Weight of final consumption expenditure of EP in the national economy		0,5%	0,5%	
Final consumption expenditure of EP services	10 ⁶ euros	1,108.9	1,109.7	0.1
<i>Final consumption expenditure in the national economy</i>		158,833.3	161,474.6	1.7
Weight of final consumption expenditure of EP in the national economy		0.7%	0.7%	
Investments (P51G+NP) for the output of EP services	10 ⁶ euros	763.6	805.2	5.5
<i>Investments in the national economy</i>		25,993.1	27,843.9	7.1
Weight of investments for the output of EP services in the national economy		2.9%	2.9%	
<i>by memory:</i>				
Output of EP services		2,646.0	2,952.5	11.6
<i>Economy output</i>	10 ⁶ euros	310,198.4	318,313.5	2.6
Weight of output of EP services in the national economy		0.9%	0.9%	
GDP	10 ⁶ euros	173,079.1	179,809.1	3.9

In 2015 the waste management was the most relevant area in production (62.4% of the total), followed by wastewater management (25.0%).

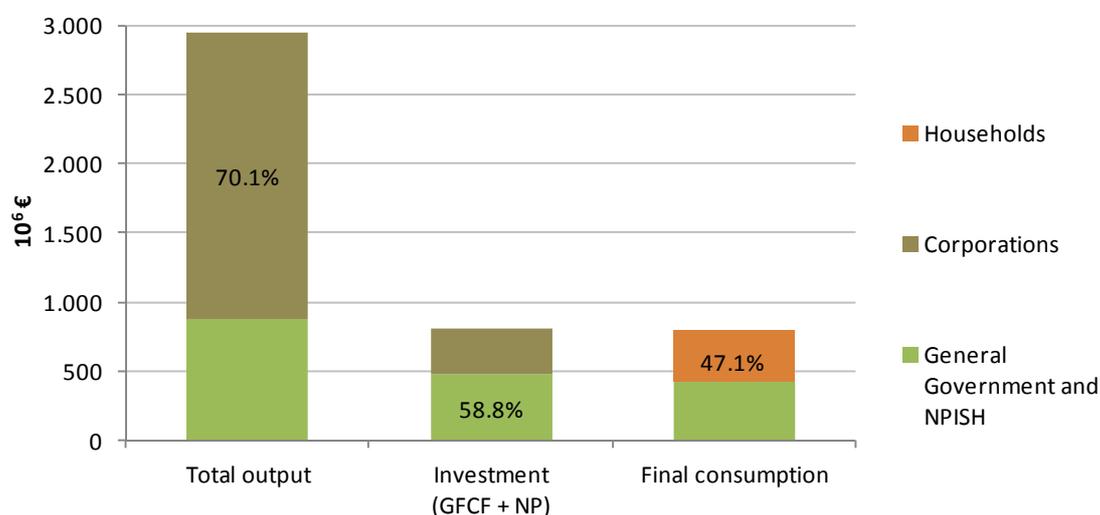
The production of environmental protection services by the **Corporations** amounted to 2,068.7 M€ (70.0% of the total).

In the same year, the production of environmental protection services by **General Government and**

Non Profit Institutions Serving Households (NPISH) amounted for 883.8 M€. The **General Government and NPISH** accounted for 58.8% of the *investment* and the **Corporations** for 41.2%.

Households accounted for 52.9% of final consumption expenditure on environmental protection services, and the remaining by **General Government**.

Chart 10: Main variables of the Environmental Protection Expenditure Accounts, by institutional sector



Methodological Notes:

The Environmental Goods and Services Sector Accounts (EGSS) and the Environmental Protection Expenditure Accounts (EPEA) are part of the System of European Economic Environmental Accounts (SEEA) and are two of the new mandatory transmission modules, from 2017 onwards, to comply with Regulation (EU) No. 538/2014. Accordingly, Member States are required to report these accounts to Eurostat from December 2017 on the years n-3 and n-2 (2014 and 2015).

The environmental accounts were developed in interconnection with the System of National Accounts (SNA). They are a satellite account system that presents environmental information in a format compatible with the National Accounts information, enabling an integrated analysis.

Environmental Goods and Services Sector Accounts (EGSS)

In addition to the Regulation, EGSS's main methodological reference documents are the Eurostat handbooks: *Environmental goods and services sector accounts Handbook* and *Environmental goods and services sector accounts Practical guide*. In addition, since EGSS is a project consistent with the SNA, the use of its concepts, nomenclatures and methodological references is essential, namely the United Nations System of National Accounts (SNA2008) and the European System of Accounts (ESA2010).

Statistics on environmental goods and services record and present data on production activities of national economies that generate environmental products in a manner consistent with the data transmitted under ESA2010. Environmental products (environmental goods and services) have as their main objective environmental protection or resource management. The selection and classification of the products and economic activities covered by this project comply with the requirements of the manual *Environmental goods and services sector accounts Practical guide* (Annex: compendium indicative of environmental goods and services and economic activities to be covered by the Regulation).

EGSS results are not directly comparable with the results of the Environmental Goods and Services Sector Survey, because: EGSS are a derived statistic, ie cross several sources of information (namely this survey); EGSS is a satellite account of the National Accounts. Therefore, it uses identical sources, methodologies and principles, namely exhaustiveness.

Data sources

The main data sources on which the estimate of the monetary variables of EGSS were based were the following:

• Statistics Portugal:

- Portuguese National Accounts (Base 2011);
- General File of Statistical Units;
- Environmental Goods and Services Sector Survey (ISBSA);
- Business Survey on Management and Protection of the Environment (IEGPA);
- Survey on Urban Waste Management Entities (IEGRU);
- Municipal Environmental Protection Survey (IMPA);
- Survey on Non-Governmental Environmental Organizations (IONGA);
- Survey of Fire Brigade Entities (IEDCB).

• Other sources:

- Detailed analytical balance sheets of General Government entities (including the General State Account);
- Simplified Business Information (SBI);
- National Scientific and Technological Potential Survey (IPCTN).
- Electronic pages of units of economic activity;
- Reports and Accounts.

EGSS data is broken down according to the following nomenclature of environmental activities and products:

Table A.1: Classification of the domains of the environmental goods and services sector

Classification of environmental goods and services sector domains		
Environmental protection activities		Examples
CEPA 1	Protection of ambient air and climate	Equipment for the reduction of atmospheric emissions.
CEPA 2	Wastewater management	Collection and treatment of wastewater including monitoring and regulation activities.
CEPA 3	Waste management	Collection and treatment of waste, including monitoring and regulation activities. Recycling and composting, street cleaning and the collection of public litter.
CEPA 4	Protection and remediation of soil, groundwater and surface water	Monitoring and control of soil and groundwater pollution.
CEPA 5	Noise and vibration abatement	Abatement of noise in places frequented by the public (swimming pools, etc.), in schools, etc.
CEPA 6	Protection of biodiversity and landscapes	Maintaining or establishing certain landscape types, biotopes, eco-zones, etc. having a clear link to biodiversity preservation.
CEPA 7	Protection against radiation	Handling, transportation and treatment of high level radioactive waste that requires shielding during normal handling and transportation.
CEPA 8	Research and development in environmental protection (R&D)	R&D activities oriented towards environmental protection (identification and analysis of sources of pollution, their effects on human beings, the species and the biosphere); R&D for the prevention and elimination of pollution.
CEPA 9	Other environmental protection activities	Training or teaching activities specifically oriented towards environmental protection and consulting activities in non-discriminated environmental protection areas.
Resource management activities		
CRReMA 10	Management of waters	Minimisation of inland waters intake through the reduction of water losses and leaks or water reuse and savings. (1)
CRReMA 11	Management of forest resources	
CRReMA 11A	Management of forest areas	Measuring, controlling and monitoring forest areas and timber stocks; education, training and general administration activities linked to the management of forests.
CRReMA 11B	Minimisation of the intake of forest resources	Reducing the input of forest-related products (wood and non-wood); recovery, reuse or savings of forest products and byproducts. Non wood forest products include cork.
CRReMA 12	Management of wild flora and fauna	Restoration activities (replenishment of wild flora and fauna stocks); education, training and general administration activities linked to the management of wild flora and fauna.
CRReMA 13	Management of energy resources	
CRReMA 13A	Production of energy from renewable sources	Production of energy from renewable sources (wind, solar, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases).
CRReMA 13B	Heat/Energy saving and management	Energy savings, thermal insulation activities and energy recovery (e.g. cogeneration, reduction of energy transport and distribution losses, energy efficiency improvements).
CRReMA 13C	Minimisation of the intake of fossil resources as raw material	Minimization of fossil resources through changes in the manufacturing process, recovery of materials based on non-energy fossil resources and production of petroleum product substitutes.
CRReMA 14	Management of minerals	Saving of mineral resources through recovery of mineral-based materials (waste and scrap processing of metallic and non-metallic mineral materials and other articles).
CRReMA 15	Research and development (R&D) for resource management	R&D activities for new applications in the field of natural resource management and savings: R&D for renewable energy, for energy and minerals savings, for timber and other biological resources savings, etc.
CRReMA 16	Other resource management activities	Education and training activities that relate to natural resources, as well as other kinds of consulting activities leading to indivisible output.

(1) The abstraction, treatment and distribution of water should, in principle, be excluded. However, the Environmental goods and services sector accounts, Practical Guide refers that if the available data sources do not allow their separation, they can be included in CRReMA 10 (this is the national case).

Source: based on the Environmental goods and services sector accounts, Practical Guide

Environmental Protection Expenditure Accounts (EPEA)

EPEA provide data on expenditure in the areas of environmental protection, i.e. the economic resources allocated by resident units to environmental protection. These accounts allow the compilation of National Expenditure on Environmental Protection (NEEP), defined as the sum of the uses of environmental protection services by resident units, gross fixed capital formation (GFCF) for environmental protection activities and transfers for protection of the environment that do not constitute a counterpart of the previous elements, less the financing by the rest of the world (RM). While a Member State is not in a position to calculate NEEP autonomously, with regard to the level of current transfers and capital from / to the Rest of the World, provided that they do not constitute a counterpart of previous elements, the algorithm provided by the reporting system to Eurostat is calculated directly through the set of remaining variables reported:

$$\text{EPEA} = \text{final consumption expenditure} + \text{intermediate consumption} + \text{investment (GFCF + NP)} - \text{current and capital transfers received from the Rest of the World} + \text{current and capital transfers paid to the Rest of the World}$$

Like EGSS, in addition to the Regulation and methodological references of the National Accounts, EPEA have other specific methodological reference documents, namely Eurostat's *Environmental protection expenditure accounts Handbook 2017 edition*. The list of products and economic activities covered by this project also complies with the requirements of the manual *Environmental goods and services sector accounts Practical guide* (Annex: compendium indicative of environmental goods and services and economic activities to be covered by the Regulation).

These accounts relate to EGSS, but:

- Restrict the domains of observation to environmental protection (CEPA classification), i.e. they do not cover Resource Management;
- Focus predominantly on the share of specific environmental products that correspond to specific environmental protection services, abbreviated to PA services.

The set of environmental protection products, which encompasses goods and services, can be categorized according to whether or not they have the primary purpose or secondary purpose of protecting the environment. Products whose main purpose is environmental protection are designated in the methodological manual by Specific Products EP. The portion of the specific EP products corresponding to services are the EP services;

- Do not detail activities by NACE;
- Extend the number of estimated variables;
- Detail most of the variables by institutional sector.

Note on international trade in PA services

International trade in PA services corresponded to the following services:

- Basic sanitation services; sewage sludge (CEPA 2);
- Waste collection, treatment and disposal services; services (CEPA 3).

International trade in EP services in the field of waste water management (CEPA 2) or waste management (CEPA 3) also includes operations for commissioning (without transfer of ownership) between two countries. In these cases, the export of these services corresponds to the value of the service rendered by Portugal abroad, and the importation appears in the opposite case, when Portugal resorts to another country to treat its waste.

Final considerations

Although these accounts are already covered by a EU regulation, these projects are still under conceptual discussion at Eurostat, notably on environmental boundaries and classification of included products.