EUROPEAN COMMISSION
EUROSTAT

Directorate E: Sectoral and regional statistics
Unit E-2: Environmental statistics and accounts; sustainable development

Introduction to classification of environmental functions (CEF)

1. Scope and characteristics

The Classification of Environmental Functions (CEF) is a generic, multi-purpose, functional classification used for classifying activities, products, expenditure and other transactions related to environmental protection and management of natural resource.

Environmental protection activities are defined as economic activities aimed at preventing, reducing and eliminating pollution or any other degradation of the environment. Also included are measures to restore the environment after it has been degraded. Resource management activities include the preservation, maintenance and enhancement of the stock of natural resources and therefore the safeguarding of those resources against depletion.

Environmental products include i) goods and services produced, designed and manufactured for purposes of environmental protection and management of natural resource (e.g. sewerage services and collection, treatment and disposal services for waste, equipment for renewable energy production), ii) cleaner and resource efficient products (e.g. electricity, gas and heat from renewable sources, the most efficient domestic appliances).

Environmental expenditure consists of the transactions related to environmental activities and products, e.g. inputs for environmental activities (energy, raw materials and other intermediate inputs, wages and salaries, taxes linked to production, consumption of fixed capital); investments; household expenditure on environmental products; transfers for environmental protection and management of natural resources (subsidies and other current transfers (e.g., regular payments to support international aid programmes), investment grants, international aid, taxes earmarked for environmental protection, etc.).

The CEF is based on the pre-existing functional classifications used for monetary environmental accounting:

- classification of environmental protection activities and expenditure (CEPA 2000);
- classification of resource management activities and expenditure (CReMA 2008).

The CEPA 2000 is an internationally agreed classification included in the family of international standard classification[1].

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[1] The International Family of Classifications primarily contains those classifications that have been reviewed and approved as guidelines by the United Nations Statistical Commission or other competent intergovernmental bodies, covering broad statistical areas such as economics, demographics, labour, health, education, social welfare, geography, environment, and tourism, among others.

The CReMA 2008 (or CReMA for short) has been developed by Eurostat and used in Europe for data collection and analysis of statistics on the Environmental Goods and Services Sector (EGSS)[2]. It includes activities and expenditures related to the management of natural resources, i.e. the preservation and maintenance of the stock of natural resources. The CReMA was built consistently with the structure and classification principles of the CEPA. Categories were built complementarily with CEPA and without overlapping with CEPA classes (the numbering of the CReMA classes follows the CEPA's one).

2. Classification purpose and structure

Purpose

The purpose of the classification of environmental functions is to offer an integrated framework, flexible enough to ensure the collection and reporting of data on environmental activities and transactions, and the organisation of the information according policy needs in the short, medium and long-term.

In this context, the following "principles" are at the basis of the classification's design:

- the first level of classification should be informative and clear for the users about the specific environmental activities, products and expenditures included, and ideally also their primary environmental purpose (commonly directly linking with one or a number of environmental policies);
- the breakdown at all levels (first, second and third) should ensure (as much as possible) symmetry across categories of a given classification detail in the availability of information, e.g. it should be avoided that similar type of activities (from the functional point of view, e.g. in-process modification) in one category are available at the third level split while in the other categories the same information is already relatively well defined at the second level breakdown.

Structure

The level 1 structure of CEF (the 1-digits) are the CEF divisions. CEF divisions 1 to 7 are also called (environmental) domains. The level 2 structure of CEF (the 2-digits) are the CEF groups and the level 3 (the 3-digits) are the classes.

At the first level split, the CEF groups together "homogeneous" environmental protection and/or resource management categories, i.e. categories that are linked together and represent borderline cases, such as for example in the case of activities related to biodiversity and forest, or air and energy (see Table 1).

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[2] See Environmental goods and services sector accounts, Handbook, 2016 Edition.

Table 1 – Classification of environmental functions - divisions

1	**Air, climate and energy**
2	**Wastewater and water resources**
3	**Waste, materials recovery and savings**
4	**Soil, surface and groundwater, biodiversity and forest**
5	**Noise and radiation**
6	**Research and development**
7	**Cross-cutting and other activities**

CEF divisions 6 and 7 include transversal functions, i.e. R&D and administration, management as well as education, training and information. Ideally administration and management as well as education, training and information activities should be classified by environmental domains. Since primary data sources often do not allow the split, they are re-grouped in CEF 7.

At the second level split the environmental protection or resource management categories are singled out. This split also ensures a bridge with CEPA and CReMA as separate classification and as used to classify environmental activities, products, expenditure and other transactions, so that time series reconciliation can be relatively easily established[3].

At the third level split, in almost all cases, an extra level of granularity is offered with regard to the activities, actions, expenditures that are object of the classification (an exception is for materials recovery (CEF 3.2) where the third level split is based on material type).

The structure of the CEF classification has been designed to be flexible enough to accommodate policy and user needs of different international settings. National compilers can also consider to have further level of details to organize available information in their country and relevant for policy needs, by using additional level splits. E.g. the CEF 1.2.1 "Production of energy from renewable sources" can be further detailed by energy sources (wind, solar, etc...) or CEF 7.1 "General environmental administration, management, regulation, dissemination and consultancy" can be further detailed by environmental domains (waste, wastewater, air, etc…) by adding a fourth and a third level split respectively, to organise the possible available information at national level.

3. Classification criteria

The CEF encompasses all activities, goods and services that have an environmental purpose, i.e. that have as primary purpose to prevent, reduce and eliminate pollution and other

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[3] This is particularly important in Europe to preserve data time series built over the last decade, in particular about products and activities of the environmental sector (EGSS account), environmental expenditure (EPEA account) and environmental subsidies (ESST account).

forms of degradation of the environment (e.g. treatment of waste and wastewater, protection of biodiversity), or to make more efficient use of natural resources, and hence safeguarding from depletion (e.g. recovery and substitution of natural resources, recharges of natural stocks).

The principal basis for determining the environmental purpose of an activity is the technical nature of the activities and produced goods and services. It determines whether or not the activity is suitable to reduce the pressure on the environment, through prevention, reduction and elimination of pollution or through the reduction of the use of natural resources, whatever the stated motivations and presumed or real effects are. By extension, activities that support the production and the use of environmental products (administration, education, training, information and communication services) as well as environmental research and development activities are also considered environmental activities.

From a statistical point of view, the technical nature is the most neutral basis for determining the environmental protection purpose. Indeed it allows checking the purpose of production activities by considering their suitability from a technical perspective for achieving the environmental purpose, whatever the motivation of the agent that performs it.

It should be also considered that, the purpose of an activity is different from the effect of an activity. Actions and activities undertaken for other than environmental purposes (e.g. human health) can have positive environmental effects; these activities are out of the CEF scope.

As for every functionally oriented classification, there is the possibility that a same activity could serve different environmental purposes in different countries (e.g. the purchase of double-glazed windows in warm countries will typically relate to issues of noise protection, whereas in colder countries they will be an energy saving device). In order to reduce the possible difficulties for the compiler and to have comparable statistics, some clarification, examples and operational rules have been added in the explanatory notes, in order to clarify and harmonize the classification of a number of activities that could lead to different interpretations by the compilers of statistics and accounts.

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Proposal for the structure of the classification of environmental functions (CEF)

LEVEL I - DIVISION	LEVEL II - GROUP	LEVEL III - CLASS	
1	**Air, climate and energy**		
	1.1	**Reduction and control of air emissions (excluding energy related measures)**	
		1.1.1	*Prevention of pollution*
		1.1.2	*Treatment*
		1.1.3	*Monitoring, measurement and similar*
		1.1.4	*Other activities*
	1.2	**Energy from renewable sources**	
		1.2.1	*Production of energy from renewable sources*
		1.2.2	*Equipment and technologies for renewable energy*
		1.2.3	*Supporting services for renewable energy*
		1.2.4	*Monitoring, measurement and similar*
		1.2.5	*Other activities*
	1.3	**Energy savings and management**	
		1.3.1	*Energy savings through in-process modifications*
		1.3.2	*Energy efficient buildings; other efficient energy-demand technologies*
		1.3.3	*Monitoring, measurement and similar*
		1.3.4	*Other activities*
2	**Wastewater and water resources**		
	2.1	**Wastewater management**	
		2.1.1	*Prevention of pollution*
		2.1.2	*Sewerage networks*
		2.1.3	*Wastewater treatment*
		2.1.4	*Treatment of cooling water*
		2.1.5	*Monitoring, measurement and similar*
		2.1.6	*Other activities*

LEVEL I - DIVISION	LEVEL II - GROUP	LEVEL III - CLASS	
	2.2	**Water savings and management of natural water resources**	
		2.2.1	*Reduction of the intake*
		2.2.2	*Water reuse and savings, reduction of water losses and leaks*
		2.2.3	*Replenishment of water resources*
		2.2.4	*Monitoring, measurement and similar*
		2.2.5	*Other activities*
3	**Waste, materials recovery and savings**		
	3.1	**Waste management**	
		3.1.1	*Prevention of pollution*
		3.1.2	*Collection and transport*
		3.1.3	*Treatment and disposal of hazardous waste*
		3.1.4	*Treatment and disposal of non-hazardous waste*
		3.1.5	*Monitoring, measurement and similar*
		3.1.6	*Other activities*
	3.2	**Materials recovery and savings**	
		3.2.1	*Wood and paper*
		3.2.2	*Mineral (metal, stone, glass, ceramics, other)*
		3.2.3	*Plastic*
		3.2.4	*Textiles*
		3.2.5	*Other materials*
		3.2.6	*Monitoring, measurement and similar*
		3.2.7	*Other activities (related to the recovery of materials)*
4	**Soil, surface and groundwater, biodiversity and forest**		
	4.1	**Protection of soil, surface and groundwater**	
		4.1.1	*Prevention of pollutant infiltration*
		4.1.2	*Cleaning up of soil and water bodies*
		4.1.3	*Protection from erosion and other physical degradation of soil and water*
		4.1.4	*Prevention and remediation of soil and groundwater salinity*
		4.1.5	*Monitoring, measurement and similar*
		4.1.6	*Other activities*

LEVEL I - DIVISION	LEVEL II - GROUP	LEVEL III - CLASS	
	4.2	**Protection of biodiversity and landscape**	
		4.2.1	*Protection and rehabilitation of species and habitats*
		4.2.2	*Protection of natural and semi-natural landscapes*
		4.2.3	*Monitoring, measurement and similar*
		4.2.4	*Other activities*
	4.3	**Management of forest resources**	
		4.3.1	*Reforestation, afforestation and forest-related land management*
		4.3.2	*Protection against forest fires*
		4.3.3	*Monitoring, measurement and similar*
		4.3.4	*Others activities*
5	**Noise and radiation**		
	5.1	**Protection against noise and vibration**	
		5.1.1	*Prevention and reduction of noise and vibration*
		5.1.2	*Monitoring, measurement and similar*
		5.1.3	*Other activities*
	5.2	**Protection against radiation**	
		5.2.1	*Protection of ambient media*
		5.2.2	*Transport and treatment of high level radioactive waste*
		5.2.3	*Monitoring, measurement and similar*
		5.2.4	*Other activities*
6	**Research and development**		
	6.1	**R&D for air, climate and energy**	
	6.2	**R&D for wastewater and water resources**	
	6.3	**R&D for waste, materials recovery and savings**	
	6.4	**R&D for soil, surface and groundwater, biodiversity and forest**	
	6.5	**R&D for noise and radiation**	
7	**Cross-cutting and other activities**		
	7.1	**Environmental education and training**	
	7.2	**General environmental administration, management, regulation, dissemination and consultancy**	
	7.3	**Environmental activities not elsewhere classified**	