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General Government and Specialised Producers data collection handbook

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Preface

We are pleased to present this user-friendly handbook on how to collect, interpret and present data relating to expenditure on environmental protection by General Government and specialised producers. This handbook is intended as a reference tool for international activities in connection with national and environmental accounts.

Eurostat works in several areas of environmental accounting. In order to provide information on both current and future environmental sector policy, there is a need to produce and compile comparable statistics on environmental expenditure.

The role of Eurostat is not itself to compile environmental statistics, but to encourage and coordinate production and delivery by the Member States' authorities. Thus Eurostat promotes regular production of environmental statistics and the implementation of data systems that allow regular and efficient production of those statistics.

To date, there have been a substantial number of statistics-related pilot projects, applications and implementation studies in Member States and a considerable number are ongoing. This handbook deals with a key issue related to Environmental Statistics: environmental expenditure by both the General Government and specialised producers.

The handbook is intended to be a complete reference tool for a data collection system at national level. It is designed as a practical aid for compiling statistics on environmental protection expenditure by both General Government and specialised producers and describes each step in the process, either by means of an explanatory text or on the basis of examples taken from the experience of various countries. Its purpose is to gather standards, methods and classification of statistics on environmental expenditure. It should facilitate the development and production of harmonised data and enable more rigorous and improved cross-country comparison of data. It provides users with recommendations.

Special thanks are owed to members of the Working Group on Environmental Expenditures Statistics and of the Task Force on "Environmental Protection Expenditure", who have made this publication possible. Eurostat is particularly grateful for contributions from:

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Rainer Muthmann,

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Glossary

Activities: What take place when resources such as equipment, labour, manufacturing techniques, information networks or products are combined, leading to the creation of specific goods or services.

Ancillary activity: Principal and secondary activities are generally carried out with the support of a number of ancillary activities, such as accounting, transportation, storage, purchasing, sales promotion, repair and maintenance, etc. Products other than capital formation which are retained for use in the same unit are referred to as ancillary activity. Thus, ancillary activities are those that exist solely to support the main productive activities of an entity by providing non-durable goods or services for the use of that entity.

Central government: It includes all administrative departments of the central state and other central agencies whose competence extends over the entire economic territory, except for the administration of social security funds.

Environmental protection activities: Activities (involving the use of equipment, labour, manufacturing techniques and practices, information networks or products) where the main purpose is to collect, treat, reduce, prevent or eliminate pollutants and pollution or any other degradation of the environment due to the pressure of human activities.

Environmental Protection Expenditure Account (EPEA): Satellite accounts aiming at describing the measures and the related expenditures carried out to protect the environment from a qualitative perspective, i.e. against pollution and degradation phenomena.

General Government: All institutional units which produce services delivered free or at a non-economically significant price for individual or collective consumption AND which are mainly financed by compulsory payments made by units belonging to other sectors AND do not enjoy autonomy of decision.

It corresponds to the code S13 of ESA 95, comprising entities that are engaged primarily in the production of non-market goods and services intended for individual and collective consumption and/or in the redistribution of national income and wealth.

General Government is divided into four sub-sectors, i.e. central, state, and local government and also social security funds. Excluded are government-owned entities that conduct commercial operations, such as public enterprises.

Governmental specialised producer: Entities controlled by government either through public ownership (more than 50 percent of the shares) or by special legislation, regardless of whether they produce market or non-market goods or services AND of whether they have autonomy of decision or not.

Joint Questionnaire (JQ) : Questionnaire used for data collection on environmental protection expenditure and revenues since 1996 and drawn up jointly by OECD and Eurostat.

Local government: This sector comprises, as defined in the ESA 95, public authorities and/or bodies, excluding local agencies for social security funds, whose competence extends only to a local area of the country's economic territory.

Local kind of activity unit: Enterprise, or a part of an enterprise, corresponding to a local unit, which engages in only one kind of (non-ancillary) productive activity or in which the principal productive activity accounts for most of the value added. These type of units do not have autonomy of decision.

Market products: Products which are sold at a price which is economically significant, so the sale covers more than 50 percent of the production costs. The price considered is the price not including VAT or other taxes or subsidies.

Non-market products: Products which are provided freely or at an economically insignificant price.

Principal activity: For a market producer, this is the activity which produces most of the revenue (strictly most of the gross value added) of the entity under consideration. For non-market producers, the principal activity is the one which accounts for most of the costs of production. The principal activity so identified does not necessarily account for 50% or more of the entity's total value added.

Public corporations: Market producers with no autonomy of decision that are subject to control by government units (according to a specific legislation or to the percentage of the share detained by the government).

Public-private partnership: Complex legal arrangement designed to share the control and the risks and rewards of a set of fixed assets between a private enterprise and a public unit, normally a unit of General Government.

Public sector: In the JQ, those units which carry out non-market activities and Non Profit Institution Servicing Households (NPISH).

Secondary activity: Activity which does not represent the greater part of the Gross Value Added of the producer and is not destined to be used by other units in this enterprise. If such subsidiary activity is retained by the enterprise but is recorded as capital formation, it is also recorded as secondary production.

Specialised Producers: In the EPEA, all those producers whose principal activity is the production of environmental protection (EP) services, regardless of whether they belong to the private or public producers group or if they carry out market or non-market activities.

In the JQ, all units which produce market environmental protection services regardless of whether they belong to the private or public producer group.

State government: The ESA 95 defines this sector as comprising separate institutional units exercising some of the functions of government (excluding the administration of social security funds) at a level below that of the central government and above that of the local government.

Abbreviation list

CEPA: Classification of Environmental Protection Activities

CFC: Consumption of Fixed Capital

COFOG: Classification Of Functions Of Government

EP: Environmental Protection

EPEA: Environmental Protection Expenditure Account

EPE: Environmental Protection Expenditure

ESA 95: European System of Account (1995)

GBAORD: Government Budget Appropriation or outlays on Research and Development

GDP: Gross Domestic Product

GFCF: Gross Fixed Capital Formation

GG: General Government

JQ: Joint Questionnaire

LKAU: Local Kind of Activity Unit

NA: National Accounts

NACE: Nomenclature of Activities in the European Community

NOS: Non-Operating Surplus

NPISH: Non-Profit Institution Servicing Households

PPP: Private-Public Partnership

R&D: Research and Development

SBS: Structural Business Statistics

SEEA: System of Environmental and Economic Accounting

SERIEE: System for the Collection of Economic Data on the Environment

SNA: System of National Accounts

1. Introduction

This chapter presents the policy context, the organisation of the environmental protection expenditure statistics, the scope of the environmental protection and the purpose and structure of the handbook.

1.1 Policy context

Formulated in the last decades, the concept of sustainable development designates a framework promoting the continuity of economical and social development without detriment to environment and the natural resources essential for human activity. This notion of sustainable development is becoming an increasingly essential component of national and international development policies.

To ensure sustainable development, the quality and preservation of natural resources and the environment need to be recognised as the basis of continued human activities and of social and economic development. A number of international agreements have expressed humankind's determination to express economic development in the context of policies which safeguard the environment.

In the case of the European Union, the Treaty of Rome, establishing the European Community, as amended by the Single European Act in 1986, explicitly provides for the development and implementation of a Community policy on the environment. In 1992, the Maastricht Treaty set the objective of promoting sustainable growth while respecting the environment.

For years, Community environmental policy has essentially consisted of the elaboration of a legislative framework aimed at combating pollution and protecting the environment. Bringing together the community, the Member States have adopted various policies and regulations aiming at, for example, preventing or reducing air pollution and pollution due to liquid effluents and waste.

Today, a whole range of supplementary instruments is also used. The Member States have established, alongside legislative controls, a system of taxes that introduce the cost of pollution into the price system. Governments can levy taxes directly linked to pollution or provide other economic incentives, such as subsidies, in order to change production or consumption behaviour.

Environmental protection activities can also be a consequence of the application of voluntary agreements between public authorities and other economic sectors[1]. These agreements are becoming more and more important in Europe. They cover any official multilateral commitment aiming at reaching precise objectives and/or at carrying out a set of actions preventing or reducing pollution in a given timeframe.

Because all activities inevitably affect the environment to some degree, all sectors of the economy have their specific role and responsibilities. The overall effort to minimise the negative consequences on the environment involves the government agencies, local authorities, industries and households as both producers and consumers but also other sectors, such as agriculture or construction.

[1] For example the motor industry has agreed with the European Union emission reduction targets and the chemical industry in the UK has committed to achieve certain environmental targets.

The impact of environmental protection policies on the European system of production and consumption could be expressed by three types of indicators: the first type is the development of typical environmental protection activities, the second type consists of measuring the pressures, and the third is the effective expenditure on environmental protection arising from economic and other activities. This last one is an often-used response indicator referring to responses by groups and individuals in society, as well as government attempts to prevent, compensate, ameliorate or adapt to changes in the state of the environment.

The European Community programme of policy action in relation to the environment and sustainable development "Towards Sustainability" stresses the need for reliable and comparable data, statistics and indicators as a key tool for the evaluation of the cost of controlling impacts on the environment.

The Environmental Technology Action Plan (ETAP, 2004) created by the Commission has the objective of stimulating the development of environmental technology and identifying barriers to it. In order to follow the progress of ETAP, better analyse the development of eco-innovation and evolution of environmental technologies' markets, DG Environment is promoting the development of appropriate indicators.

The Environment for Europe Process (EEP) is a unique partnership of the Member States within the UNECE region, organisations of the United Nations system represented in the region, other intergovernmental organisations, regional environment centres, non-governmental organisations and other major groups.

The EEP Committee decided in September 2000 to implement a programme on environmental monitoring, stressing the need to coordinate environmental data collection and assessment, and to ensure compatibility of data and reporting standards. Furthermore, it called for the promotion of the participation of all European countries, particularly countries in transition, in the work of the European Environment Agency (EEA) in order to make comparable, harmonise and coordinate existing data collection and processing systems, in addition to providing the necessary information for the next pan-European state of the environment reports.

For many years, European statistical services have collected data on air pollution, on energy, water consumption, wastewater, solid waste and their management in addition to environmental data of an economic nature (environmental expenditure), under a common framework, the System of Environmental and Economic Accounts (SEEA). The links between all these data enables policy makers to consider the environmental impacts of economic activities (resources consumption, air or water pollution, waste production) and to assess the actions (investments, technologies, expenditure) carried out to limit the nuisances and risks of pollution.

In recent years, a large number of studies at national or international level have focused on the integration of the environment within existing economic data systems. This could take the form of environmental economic accounting systems or more simply a collection of partial physical or monetary data.

The gathering of environmental statistics about the activities of all economic sectors is starting to be systematised within the EU. These statistics are used to assess the effectiveness of new regulations and policies. The second use of these statistics is for the analysis of the links between the pressures on the environment and the structure of the economy. Harmonised and comprehensive statistics about environmental expenditure and the sectors funding that expenditure should help to improve policymakers' decisions.

1.2 Environmental protection expenditure statistics

Eurostat collects, validates and disseminates statistics on environmental protection expenditure. Data on environmental protection in all economic sectors[2] are collected every two years using a questionnaire produced by the Organisation for Economic Cooperation and Development (OECD) jointly with Eurostat, which is addressed to more than 30 European and 7 non-European countries known as the Environmental Protection Expenditure and Revenues Joint Questionnaire.

The field covered by the environmental protection questionnaire is defined conforming to the Classification of Environmental Protection Activities (CEPA[3]), which counts nine environmental domains.

In the joint OECD/Eurostat questionnaire[4], the tables, variables, domains and definitions have been progressively revised in order to reinforce the level of harmonisation and comparability and to reduce the burden of work requested from the different countries in order to complete those questionnaires. The data collected through this joint questionnaire (JQ) are validated by Eurostat in close collaboration with participating countries and with the OECD.

On the other hand, data on environmental protection expenditure are also included in the regulation on Structural Business Statistics (SBS)[5]. For the industrial sector environmental expenditure, a data collection handbook is now available at Eurostat[6].

The validated data on environmental expenditure are published: They can be electronically downloaded from the Eurostat dissemination database and are published in *Statistics in Focus*, in *Detailed tables: Environmental Protection Expenditure in Europe* and other thematic publications. The *statistical yearbook* gives a complete view of the domain and presents the main problems linked to the data. Information is also available, among others, on the *CD on environmental statistics* or in the *Pocketbook*[7].

[2] Government, businesses, households, environmental protection service providers.

[3] The classification of environmental protection activities established in 1994 was revised and improved in 2000. The CEPA is described in Chapter 4 of this handbook and in Annex 1.

[4] Important debates have taken place concerning the simplification of Member State reports to the European instances. The sixth environmental action programme had an action related to the reassessment of the reporting system. Eurostat studied the problem in small groups and task forces. The joint Eurostat/OECD questionnaire 2002 was revised to take Member States' demands into account in order to better target the reports. That revision was done in agreement with the OECD and with the active participation of the European Environmental Agency. The questionnaire was also revised to better respond to the political needs.

[5] For the industrial sector, a declaration relating to regulation 58/97 concerning structural business statistics supplies annual data by economic activity for the following variables related to environmental protection expenditure: variables 21 11 0 "end-of-pipe investments", 21 12 0 "investments in integrated technologies", variable 21 14 0 "total current expenditure on environmental protection". The most important sectors (NACE 2 digits for the industry, sections C to E) are covered with a breakdown by size and by CEPA domains.

[6] Eurostat, (2005), "Environmental expenditure statistics: Industry data collection handbook".

[7] The documents containing environmental data can be downloaded at the address: http://epp.eurostat.cec.eu.int/portal/page?_pageid=0,1136239,0_45571444&_dad=portal&_schema=PORTAL

1.3 Scope of the environmental protection: main purpose versus intention

Within the SERIEE, as well as the JQ, "environmental protection" is defined as follows (*SERIEE 1994 Version,* § 2006):

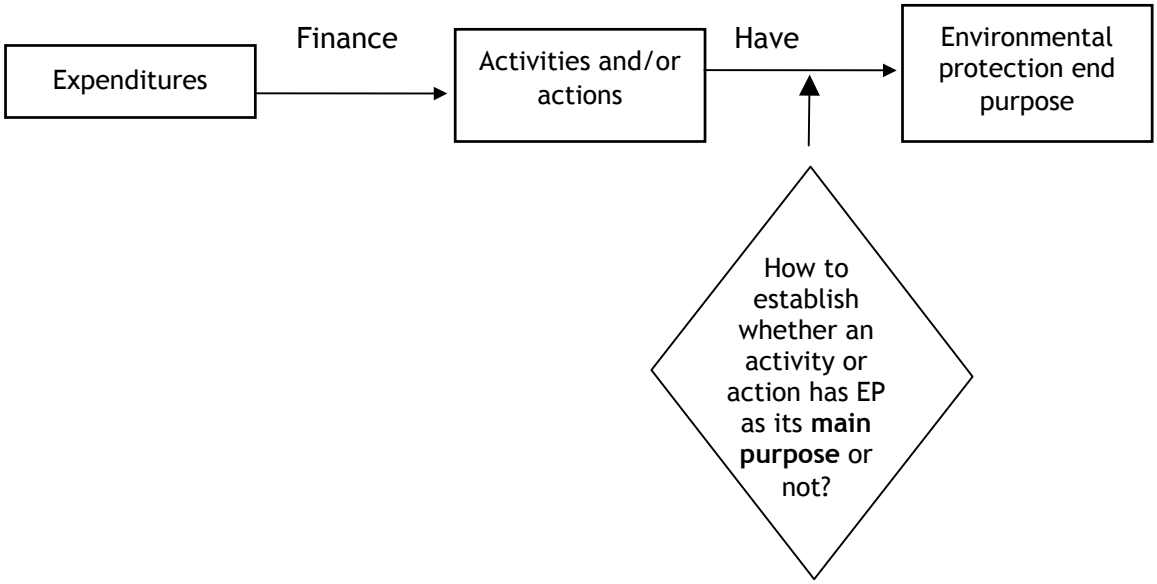
"Environmental protection groups together all actions and activities that are aimed at the prevention, reduction and elimination of pollution as well as any other degradation of the environment".

According to this definition the expenditure to be accounted for in the EPEA (or in the JQ) is that carried out for the execution of actions or activities aimed at protecting the environment, i.e. the expenditure to which the "conceptual chain" shown in Figure 1.1 applies.

Hence in order to enter expenditure in the EPEA (or in the JQ) one has to establish whether the activity or action financed by that expenditure has an environmental protection purpose. According to the SERIEE manual, an activity or action must satisfy the "end purpose" criterion to be considered as for environmental protection (SERIEE 1994 Version, § 2007), i.e. the environmental protection must be its **main purpose**.

In order to collect data on EP expenditures one of the main issues is to establish whether the activities and actions financed by the expenditures have EP as their main purpose or not.

Figure 1.1: EP purpose, activities and actions, expenditure: the "conceptual chain"



Source: Istat, 1999

The SERIEE manual states clearly that a distinction must be made between purpose and effect. Actions and activities undertaken for other than environmental purposes can have positive environmental effects and the corresponding expenditures should not be included. Thus the EP concept does not encompass all activities and expenditures that have a positive effect on the environment, but only those whose main purpose is to protect the environment.

An activity which has a positive effect on the environment does not necessarily have EP as its main purpose.

In practice the main purpose must be identified by taking into account "the technical nature as well as the policy purpose of an action or activity" (*SERIEE Environmental Protection Expenditure Accounts Compilation Guide*, page 127).

The emphasis on the technical nature of the activity implies that the main purpose has to be identified regardless of the intention of the actor that carries out the activity. For example the investments carried out by a private producer specialising in waste incineration have EP as their main purpose because this kind of activity matches the definition of EP, i.e. reduces a type of pollution; the intention or purpose of the producer is certainly to gain money.

Hence the purpose of an activity or action does not necessarily correspond to the intention/purpose of the actor.

In this type of analysis, we find a source of aid in the CEPA and CEPF[8] classifications and in the lists/examples of adapted and connected products contained in the SERIEE manual as well as in the EPEA compilation guide and the other available handbooks: these classifications and lists represent useful check lists in identifying those activities and actions which are definitely intended for protection of the environment.

Sometimes the technical nature of the activity is not enough, e.g. for boundary cases or cases not easily recognized within the available check-lists (CEPA, CEPF, etc.). In such situations, the policy purpose should be considered as well, which in practice mean considering the policy relevance of the activity in the context within which it is carried out. This does not means to consider, for example, the intention/purpose declared by the policymaker, but the relevance of the activity according to e.g. the characteristics of the country.

"For example, the purchase of double-glazed windows in warm countries will typically relate to issues of noise protection, whereas in colder countries they will be a standard energy saving device. Measures to reduce fertiliser use may primarily fall under CEPA 4 (protection of groundwater), CEPA 2 (prevention of runoff to protect surface waters) or CEPA 6 (prevention of nutrient enrichment to protect biotopes) depending on the main purpose of measures and policies. Measures against forest fires will be unimportant or purely serve economic purposes (and thus fall outside of CEPA) in some countries whereas in others the main aspect of forest fires will be an environmental one related to landscape and habitat preservation rather than protection of a natural resource" (*SERIEE Environmental Protection Expenditure Accounts Compilation Guide*, page 128).

To apply the main purpose criterion could be more or less manageable depending on the kind of economic transaction. A manageable way of applying the main purpose criterion is that established for taxes. According to Eurostat and OECD guidelines an environmental tax is "a tax whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific negative impact on the environment". "The tax base was seen as the only objective basis for identifying environmental taxes for the purpose of international comparisons. Other possible criteria, such as the name of the tax, the purpose stated by the tax legislator or the earmarking of the revenue for environmental purposes have proved to be difficult to use in practice" (Eurostat, 2001, *Environmental taxes — A statistical guide*).

A more difficult situation could be, e.g., that of subsidies, which requires the knowledge of the nature of activities and actions subsidised.

[8] Classification of Environmental Protection Facilities, (see *SERIEE 1994 Version*).

In general we can conclude that, when disputing whether a transaction has to be included in the EP scope or not, the main purpose of the activities and actions executed thanks to the expenditure must be investigated.

The main purpose should be identified primarily on the basis of the technical nature of the activity or action. All the activities and actions included in the reference check lists (e.g. CEPA, CEPF, list of connected and adapted products, etc.) have by definition the EP as their main purpose. Furthermore, for some transactions sound operational criteria are well defined in order to establish the main purpose, such as e.g. the case of the physical tax base for taxes.

Sometimes the policy purpose should be taken into account as well, i.e. the policy relevance that can be reasonably and substantially assigned to the activities and actions, given the context in which they are carried out.

In principle the intention/purpose of the actor is not relevant except in cases where it could properly reveal the policy relevance of the activities and actions; this could happen in particular for some transactions carried out by General Government.

1.4 Scope, organisation and purpose

Without a clear methodological framework, data on environmental protection expenditure can vary in terms of coverage and quality, depending on the countries involved. Nevertheless, the data collected must be trustworthy and methodologically sound. Harmonised and comparable definitions and also methodological guidelines facilitating the data collection, analysis and reporting are thus key factors.

Indeed, the long-term availability of high quality data makes it essential to establish a harmonised system at European level. To this end, the comparison of data and methods in view of the harmonisation, documentation and dissemination of methodological information is necessary.

For this reason, methodological instructions aimed at making the data collecting work of the countries easier and at guaranteeing the production of harmonised and comparable data are continuously elaborated, revised and updated.

This methodological work is mainly done together with the Member States, usually through the setting up of task forces aimed at analysing the situation in the Member States and at international level. These task forces examine the norms, definitions, standard classifications and nomenclatures in use or being elaborated concerning the main statistics, they study the availability of the data and they assess the policy needs. From there, a range of methodological work is established.

In the domains where this work is most advanced, the emphasis is on the regular supply of data and the support to the systematic elaboration of good quality statistics by the Member States to Eurostat and other international bodies.

In the field of environmental expenditure statistics, much of the work undertaken during the last years has focused on improving availability and comparability of data for the industry sector. A regulation secures availability of key data on a regular basis according to agreed standardised definitions. Definitions and methodologies have been reviewed and an industrial data collection handbook has been elaborated.

Now work has to continue on improving data availability and comparability for other parts of the economy. The producer groups concerned by this handbook are the General

Government and the Specialised Producers. The broader concept of EP Services providers, "Environmental industry" is also detailed in the OECD/Eurostat handbook entitled "The environmental goods and services industry, manual for data collection and analysis" (1999). Other corporations applying internal measures to reduce the environmental impact of their activities are already dealt with in the Eurostat "Environmental Expenditure Statistics, Industry Data Collection Handbook" (2005).

To date, definitions and methods for the compilation of environmental protection expenditure statistics are relatively well developed for environmental protection expenditure in General Government. However, in some situations, borderline cases cause problems in data reporting. One example is within waste and wastewater treatment activities. Distinctions between market producers and non-market producers and the correct allocation can cause difficulties in the reporting process of the countries.

Although data availability for General Government is relatively good, some problems with comparability across countries and across different data collection systems can arise.

The elaboration of a comprehensive methodological handbook for environmental protection expenditure of the General Government and Specialised Producers can help contribute to overcoming these difficulties and improve data comparability. The purpose of this handbook is thus to gather standards, methods and classifications of data on environmental protection expenditure for General Government and Specialised Producers.

This handbook is created in a context of already existing manuals and guidelines:

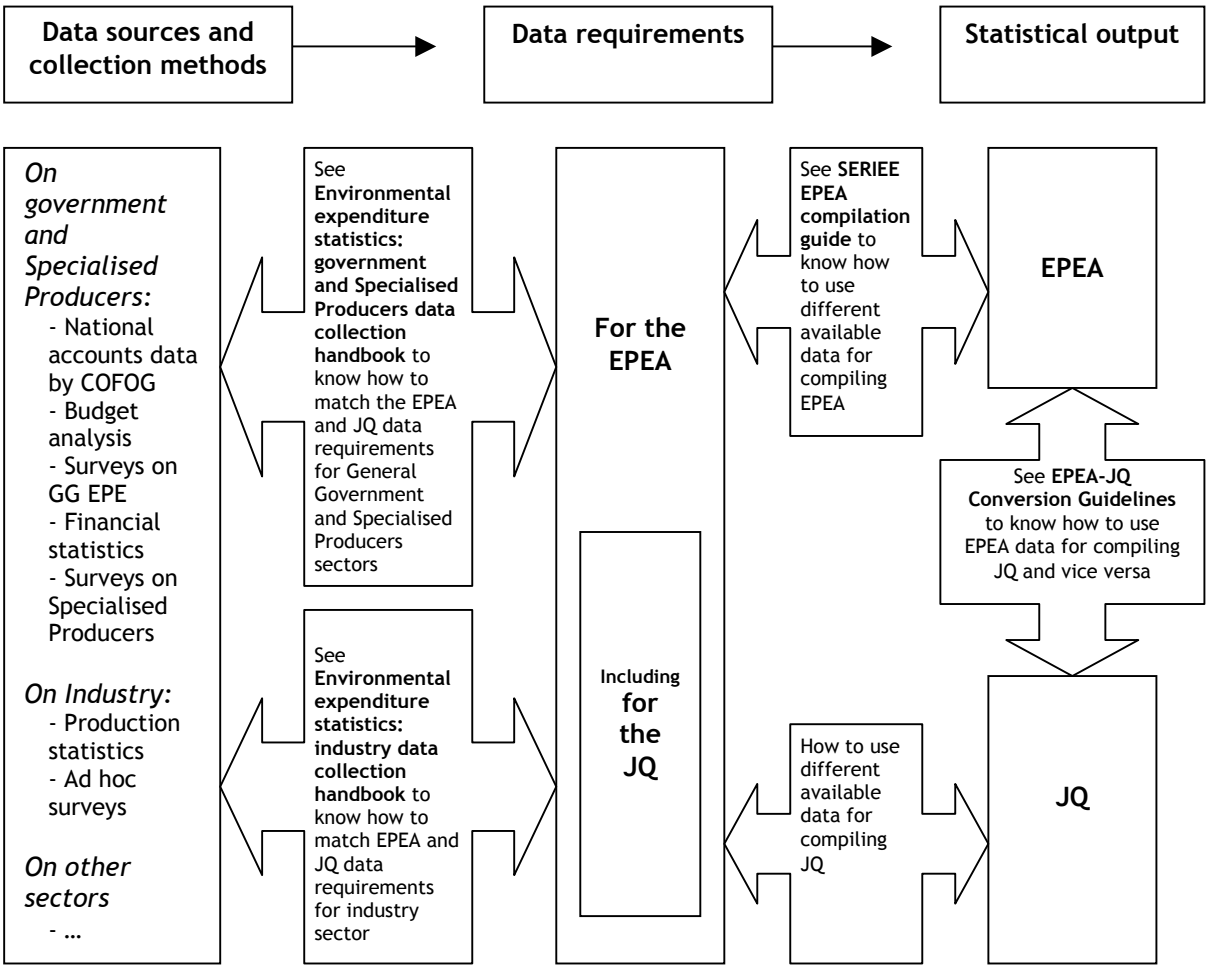
- Eurostat and European Commission, (2002), "SERIEE Environmental Protection Expenditure Accounts – Compilation guide", Luxembourg;
- Eurostat and European Commission, (2005), "Environmental Expenditure Statistics – Industry Data Collection Handbook", Luxembourg;
- Eurostat, (2005), "OECD/Eurostat Environmental Protection Expenditure and Revenue Joint Questionnaire / SERIEE Environmental Protection Expenditure Account: Conversion guidelines" , Luxembourg;
- Eurostat, (1994), "SERIEE - Système Européen pour le Rassemblement des Informations Economiques sur l'Environnement", Luxembourg.

As shown in Figure 1.2 this handbook aims at providing operational guidelines on how to collect data on EPE carried out by General Government units and Specialised Producers, in order to implement the EPEA or the JQ. To this end the core of the handbook describes:

- The role played by General Government and Specialised Producers in the field of environmental protection (chapter 3),
- The environmental protection expenditure variables that should be quantified for EPEA and JQ purposes (chapter 4),
- A set of different methodologies and techniques to collect data on EPE carried out by General Government and Specialised Producers (chapter 5).

Figure 1.2 below presents the use of these manuals in the organisation of data collection.

Figure 1.2: The General Government and Specialised Producers environmental protection expenditure handbook in the EU context of existing manuals and guidelines on EPE



Source: Istat, 2005

As a starting point, a complete view of the issues to be faced in the data collection process can be gained by reading the whole manual. Afterwards a more systematic use of the handbook should lead:

- Firstly to choosing the most appropriate data collection methodology for the country, with the help of chapter 5, and
- Then to understanding how to deal with, for EPEA and JQ purposes, the data collected for the different variables, with the help of chapter 4.

1.5 Structure of the handbook

The structure of the handbook follows the different steps in the data collection.

Chapter 2 presents the frameworks of existing data requirements at European and international level. These frameworks are in effect the basis for a reliable comparison between pan-European data.

The first step for the data collection is to identify the groups of producers concerned by the data collection needs. Chapter 3 describes the role played by Specialised Producers and General Government in environmental protection.

Another step is to translate statistics user needs in to detailed definitions. Chapter 4 gives detailed definitions of environmental protection expenditure variables subject to reporting requirements under JQ and EPEA. Then look at this chapter to find a description of the variables.

The next step is to decide how best to achieve the data collection goal. Chapter 5 describes different methodologies in the data collection and reporting process. Then look at chapter 5 to find the appropriate methodology for your country.

Once the data collection is complete, data can be analysed and presented. Chapter 6 gives a few examples of how to present and interpret the results from existing data.

The annexes include the detailed Classification of Environmental Protection Activities (CEPA 2000) in Annex 1 and other relevant documents, such as an example of the JQ 2006 and EPEA tables in Annex 2, some examples of identification of environmental share for some budget lines and subsidies in Annex 3, the Italian method for the analysis of expenditure in Annex 4 and 5, an example of a Bulgarian questionnaire on protection and restoration of the environment in Annex 6 and a detailed description of variables used in Belgium in Annex 7.

2. Accounting and data reporting frameworks on EPE

The following chapter presents a brief description of the main existing frameworks used for international data reporting on environmental protection expenditure by General Government and Specialised Producers.

2.1 The System of Environmental and Economic Accounting (SEEA)

The Integrated System of Environmental and Economic Accounting (SEEA) is a satellite system of the System of National Accounts (SNA) created under the joint responsibility of the United Nations, the European Commission, the International Monetary Fund, the Organisation for Economic Cooperation and Development and the World Bank. It brings together economic and environmental information in a common framework to measure the contribution of the environment to the economy and the impact of the economy on the environment.

It provides policymakers with indicators and descriptive statistics to monitor these interactions and also a database for strategic planning and policy analysis to identify more sustainable paths of development.

In 1993, the United Nations published a handbook on the SEEA. This handbook was a result of the discussion on environmental and economic accounting in international workshops organised by the United Nations Environment Programme (UNEP) and the World Bank.

As a result of this publication, several developed and developing countries, and in particular the London Group on environmental accounting that had been created in 1994, started experimenting on the compilation of the SEEA. The increased discussion of concepts and methods of environmental accounting together with country experiences has facilitated the convergence of compilation methodologies for selected modules of the SEEA.

In 2001, an operational manual for the SEEA was published which was prepared by the Nairobi Group (a group of experts from national and international agencies and non-governmental organisations established in 1995). This handbook reflects the on-going discussion on environmental accounts since the publication of the SEEA in 1993 and the experiences in developed and developing countries. It provides step-by-step guidance on how to implement the more practical modules of the SEEA and elaborates the uses of integrated environmental and economic accounting in policy-making.

In parallel with the work of the Nairobi Group, the Statistical Commission of the United Nations, in 1997, requested that the London Group collaborate on the revision of the SEEA. The discussion was concluded in 2002 and a revised handbook was made available in 2003. It deals with all areas of interest for environmental accounts and includes a chapter on environmental protection expenditure[9].

The SEEA 2003 comprises four categories of accounts:

- *Flow accounts for pollution, energy and materials*. These accounts provide information at the industry level about the use of energy and materials as inputs to

[9] http://unstats.un.org/unsd/envAccounting/seea.htm

production and the generation of pollutants and solid waste. It considers purely physical data.

- *Environmental protection and resource management expenditure accounts*. These accounts, which are in full accordance with those of the SERIEE system, identify expenditures incurred by industry, government and households to protect the environment or to manage natural resources. They take these elements of the existing SNA which are relevant to the good management of the environment and show how the environment-related transactions can be made more explicit.

- *Natural resource asset accounts*. These accounts record stocks and changes in stocks of natural resources such as land, fish, forest, water and minerals.

- *Valuation of non-market flows and environmentally adjusted aggregates*. This component presents non-market valuation techniques and their applicability in answering specific policy questions. It discusses the calculation of several macroeconomic aggregates adjusted for depletion and degradation costs and their advantages and disadvantages. It also considers adjustments concerning the so-called defensive expenditures.

The handbook of 2003 covers complex and diverse topics some of which are still subject to debate. Whenever possible, it reports best practices, and, where a variety of approaches exist, their advantages and disadvantages are presented. Even though a single recommendation could not always be given, the handbook represents a major step towards harmonised concepts and definitions, and provides the basis for the further development of standards.

The revised SEEA of 2003 is intended for use by both national and international agencies for compiling environmental accounts reflecting their information needs and priorities. A UN Committee was also founded to further discuss the issues still open within SEEA 2003.

In 2005, the United Nations Statistical Commission established a UN committee of experts on environmental-economic accounting at its 36th Session. Its overall objectives are to mainstream environmental-economic accounting and related statistics, to elevate the SEEA to an international statistical standard and to advance the implementation of the SEEA in different countries[10].

2.2 The European System for the Collection of Economic Data on the Environment (SERIEE)

In 1994, in order to satisfy the need for data generated by the environmental policy defined by the European Community, the European System for the Collection of Economic Data on the Environment (SERIEE) was developed. This need was in particular expressed in the Environmental Action Programmes IV and V, and Eurostat responded accordingly.

This system is intended to supply the Member States with a common framework for the collection and presentation of economic data on the environment. It follows the recommendations of Chapter XXI of the 1993 System of National Accounts (SNA) that insists on the elaboration of satellite accounts and on the cooperation between environmental specialists and National Accountants. The European Commission has in effect emphasised the need for a community framework for environmental economic accounting which could guide the decision-makers.

[10] http://unstats.un.org/unsd/envaccounting/ceea/meetings/torp.pdf

In its first stage, emphasis has been placed on environmental protection and thus SERIEE concentrates on:

- The valuation and description of resources allocated for environmental protection and the form in which they are used,

- The description of financing the cost of environmental protection,

- And the measuring of output of activities whose end purpose is environmental protection.

The main objective of SERIEE is to assess the expenditure made by resident units of the national economy for protecting the environment against pollution and other degradation, in addition to managing natural resources. The system produces aggregates consistent with the national accounts figures. An example is the aggregate called "national expenditure for environmental protection" that is consistent with Gross Domestic Product (GDP) and also makes it possible to describe who finances this expenditure and who undertakes the economic activities which protect the environment.

The integration of physical data is another objective of SERIEE. The goal is to bring together environmental protection or natural resources management expenditure and data relating to pollution emitted, resources used, in addition to equipment and installations for environmental protection. Although the system, as such, does not describe pollution, it enables a relationship to be drawn between monetary flows and data on pollution generated by various fields of activity.

It comprises two satellite accounts:

- The *Environmental Protection Expenditure Account* (EPEA), aiming at describing the measures and the related expenditures carried out to protect the environment from a qualitative perspective, i.e. against pollution and degradation phenomena;

- The *Natural Resource Use and Management Expenditure Account*, devoted to describing the measures and the related expenditures carried out to manage and save the stock of natural resources from a quantitative perspective.

Of these, EPEA is the most developed both in terms of accountings procedures and experiences by the Member States and Eurostat.

The EPEA

The EPEA is designed as a functionally oriented satellite account to the national accounts, based on the methodology set out in Chapter XXI of the System of National Accounts (SNA). It allows for links between economic and physical accounts. As a satellite account, it follows closely the principles of National Accounts (NA) as concerns the classification of units, valuation and categorisation of transactions.

The EPEA is referred to as statistics indicating the responses of society to environmental problems. The response terminology comes from the so-called PSR model: Pressures, State and Response developed by the OECD. This model was later extended with the areas of Driving forces and Impacts by the European Environment Agency[11].

[11] Model DPSIR indeed articulates in five elements, all connected by bonds of causality: a Driving force, i.e. an activity or a human development, causes a Pressure on the environment, characterised in a quantitative and qualitative way. This results in a modification of the general State of the environment which can have an impact

Measuring the financial exposure of each economy for environmental protection helps to evaluate the influence of environmental protection costs on international competitiveness, the execution of the polluter-pays principle, and cost-effect analyses of environmental control measures. Monetary data may be used to examine the extent to which different economic agents internalise the actual costs of environmental protection in their decision-making and therefore for analysing international competitiveness.

Furthermore, measuring the production and consumption of goods and services for environmental protection provides the basic data to promote economic policies concerning the so-called environmental industries. It contributes more to the determination and analysis of the economic aspects of environmental measures than to environmental issues.

The main objective of EPEA is thus to assess the actual expenditure for environmental protection made by the total economy. It is structured in order to allow various indicators to be derived from the accounts. Such information provides indicators of the response of society to reduce pollution. One may suppose that, other conditions being equal, the pressure is lower and the state of the environment is better when measures are taken in order to prevent degradation.

The EPEA is intended to respond to the three following questions:

- How much do resident units - either producers or consumers – pay, and in what form, for environmental protection?

- To what extent is this expenditure financed by the different institutional sectors?

- Which is the value of the environmental protection services produced by the different economic activities?

A central concept of the EPEA is that of national expenditure. The objective of this aggregate is to account for the entirety of the expenditure that the different agents of the national economy commit to environmental protection in a way that is consistent with the national accounts.

National expenditure is the sum of the effective uses of environmental protection goods and services by resident units. It includes the following elements, from which financing by the rest of the world can be deducted:

- Final or intermediate consumption of environmental protection goods and services;

- Gross capital formation and net acquisition of land by the producers of environmental protection services, in addition to gross capital formation in environmental protection goods and services;

- Specific transfers for environmental protection (either current or capital) when they are not the counterparts of the previous elements and in their different forms[12].

Expenditure can also be related to physical data such as the amount of waste treated or the level of air emissions. This link enables further analysis as the environmental expenditures are presented by the sectors of the economy and by environmental domains.

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on humans, on inheritance, and on the economy. This impact involves a Reaction of the company which is translated in turn by the establishment of instruments which will act on the four preceding elements.

[12] For example, international transfers or open-ended transfers (but in this case, the absence of counterparts could only be due to the lack of information). Specific transfers are presented in more detail in chapter 4.

The Economic Units

In line with national accounts classifications, the EPEA adopted several classifications for economic units, according to whether they act as producer or user/beneficiaries or whether they finance the expenditure. Thus, it uses a two-stage classification of economic units: first according to their relationship to production of Environmental Protection (EP) services (specialised or not) and then according to the institutional sectors they belong to (General Government, corporations, households, Non Profit Institutions Servicing Households (NPISH) and rest of the world).

Among the producers of environmental protection services are those that carry out an environmental protection activity as their principal, secondary or ancillary activity.

Among users and beneficiaries are General Government as a collective consumer, households as individual consumers and production units.

For the description of the financing of national expenditure, economic units are subdivided according to the institutional sectors of national accounts. The units are thus General Government, non-profit institutions serving households, corporations and households.

A lot of enterprises carry out more than one activity. In this case, activities are marked according to the Gross Value Added at factor cost they generate. In the SERIEE manual, Specialised Producers are those producers whose principal activity is the production of EP services, regardless of whether they belong to a private or public institution.

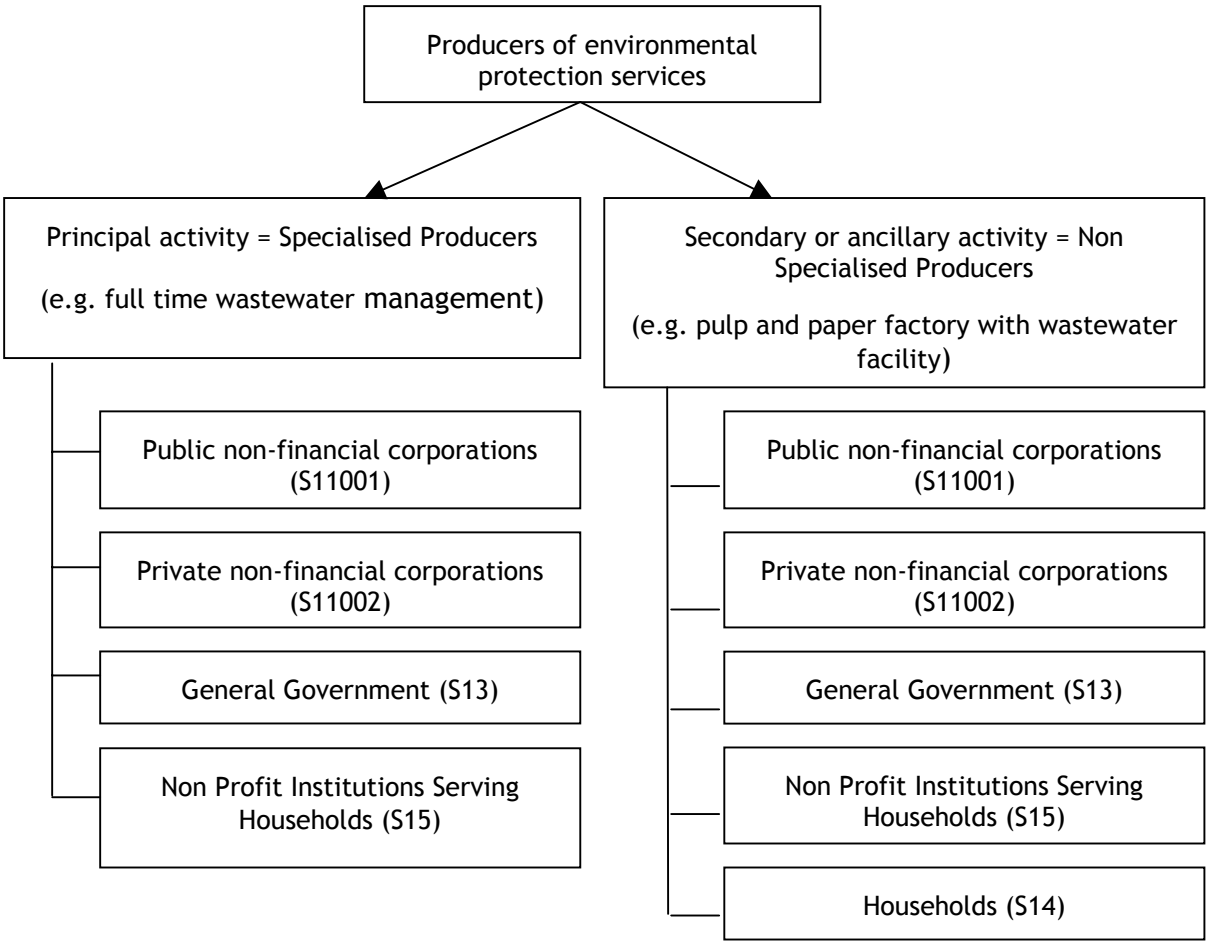
An activity is characterised as a principal activity if it represents the largest part of the Gross Added Value of the producers. The SNA 93 indicates that, even one or more secondary activities are permitted in the same establishment, these must be relatively unimportant compared with the principal activity (1994 SERIEE, § 2017). The use of this criterion is intended to allow for a strict correspondence with the NACE.

The Non-Specialised Producers group contains producers that undertake environmental protection as secondary activity or for own use (ancillary activity) in order to limit the negative environmental effects of their main production activity. The public producers may belong to the Specialised Producers group or the Non-Specialised Producers group.

Households, in their capacity as producers, are essentially non-specialised characteristic producers. According to the ESA, units of the household institutional sector may be producers, provided that the corresponding activities are not those of separate entities treated as quasi-corporations. The definition includes sole proprietorships and partnerships without independent legal status as producers of goods and non-financial services. Additionally, linked to their output of housing services ("letting of own property"), households may be led to execute ancillary activities for environmental protection. In the EPEA, these ancillary activities are treated under the corresponding NACE Rev. 1 classes. Hence, households do not appear as producers of environmental protection services. Furthermore, for the sake of simplicity, investment related to environmental protection and linked with own-account housing services, agriculture etc. are treated as gross capital formation in connected products (e.g. septic tanks, noise protective windows) of the respective industries (“SERIEE 1994 Version”, § 2161).

Figure 2.1 below presents the different categories of producers of environmental goods or services.

Figure 2.1: Classification of producers of environmental protection goods or services in the EPEA



Note: In practice, the definition of the Specialised Producers envisaged in SERIEE is applied with some flexibility. In effect, some government units that carry out EP activities cannot really be classified as Specialised Producers because their main activity is not environmental protection.

It is not obvious, for example, that environmental research is a main activity if the Ministry of Agriculture carries it out. Thus, for the sake of simplicity, all characteristic activities carried out by government are considered as main activities of General Government as a whole. Therefore, all environmental protection activities carried out by General Government units are classified as being produced by Specialised Producers.

Another example is the case of wastewater management services classified in division 41 of NACE Rev 1.1[13] because the producers are responsible for both water supply and wastewater management. In theory, these producers would be classified as secondary (non-specialised) producers in the EPEA tables. However, due to the importance of these producers, they were classified as specialised.

[13] Division 41 of NACE Rev 1.1 will be classified in the division 3600 of NACE Rev 2.

The activities

In the EPEA, the nomenclature used to classify the activities is the Classification of Environmental Protection Activities (CEPA). The CEPA is a generic, multipurpose, functional classification for environmental protection. It is used for classifying activities but also products, actual outlays and other transactions.

The CEPA combines two approaches serving to define the activities. The first uses the criterion of the nature of the pollution or the damages inflicted on the environment. The second uses the criterion of the type of activities.

This classification is described in more details in Chapter 4.1.2 of this handbook and in Annex 1.

Under the EPEA, in principle, each domain defined in the CEPA at the one-digit level should be developed in the accounts, although it is not obligatory. Practical experience shows that not all countries develop tables for the full set of domains or they do so only for some sectors. Sometimes, CEPA one-digit domains are regrouped to derive a more comprehensive domain and sometimes, data for individual domains are not collected at all. Most countries report data separately for wastewater management, waste management, air protection, noise abatement and other domains.

The EPEA tables

The EPEA framework includes a set of five interrelated tables (1994 SERIEE § 2168-2232) which describe:

- The supply (production) of EP services, and the way they are produced (Table B),
- The national EP expenditure, i.e. the expenditure for the uses (consumption) of EP services and of connected and adapted products, for gross capital formation (investment) and some other transactions related to environmental protection (capital transactions and certain transfers) (Table A),
- A table integrating supply and uses of EP services (Table B1),
- The financing of EP expenditure (Table C),
- The net cost burden of environmental protection for the various sectors of the economy (Table C1).

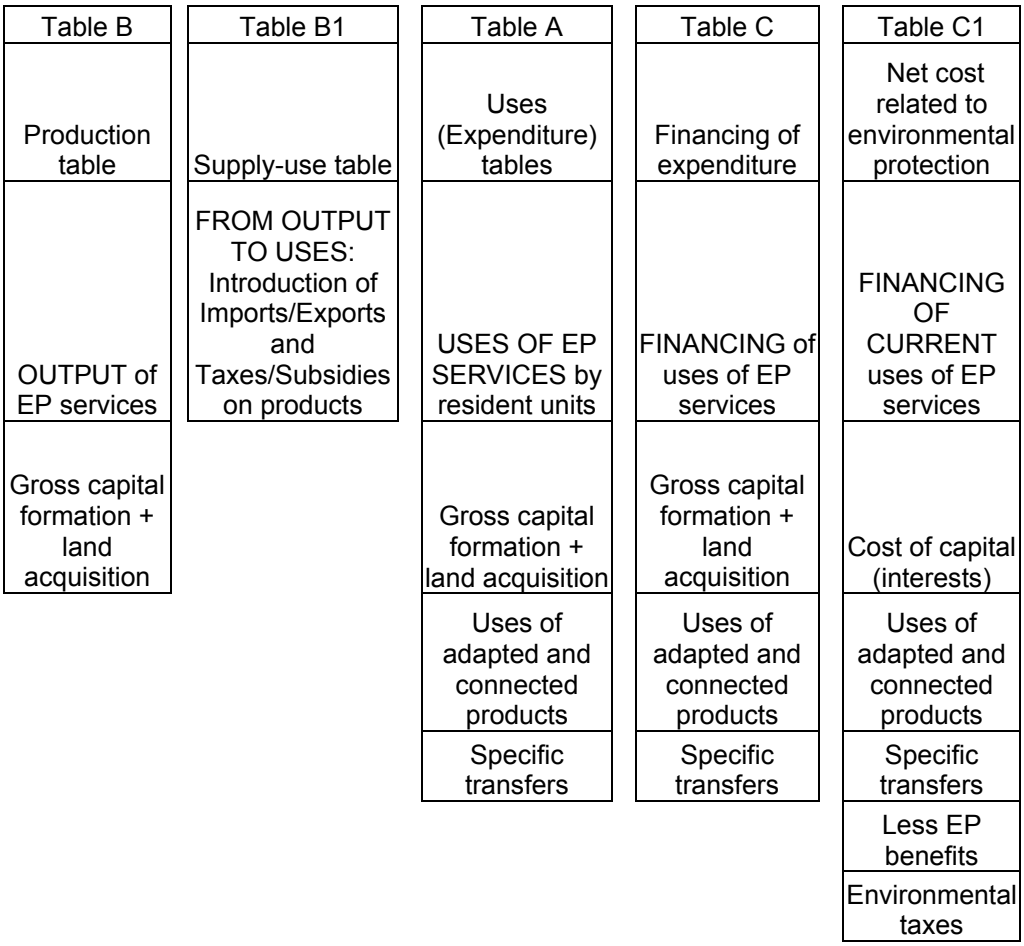
Figure 2.2 below illustrates the articulation of these various tables. The national expenditure aggregate is derived from Table A. In practice, compilation usually starts with the analysis of the production and supply of EP services and the investment needed for this production (Table B) because such information is most widely available and most reliable.

Table B determines the supply of EP services. This supply is then supplemented with available information on the uses in the integrated supply-use table (Table B1). These uses, together with some additional information (on certain transfers, on expenditures for connected products, etc.) then allow Table A to be completed and national expenditure to be determined.

Based on Table A, the financing and the net costs can be analysed (Tables C and C1). This compilation sequence (B -> B1 -> A -> C -> C1) follows a natural progression from a minimum set of data most often available in countries to more complete accounts that require additional sets of data. It is known as the ‘magic formula’, which was originally

developed by Mr Lionel Doisneau at IFEN. Following this sequence, the set of EPEA tables is presented in Figure 2.2 below.

Figure 2.2: The set of EPEA tables



The starting point of compiling the full set of EPEA is Table B which describes the domestic production of EP services and the gross capital formation (i.e., investment) of the producers. This gross (fixed) capital formation (GFCF) also includes the net acquisition of land. Practical experience suggests that net acquisition of land is not very important at the aggregate level (less than 5% of GCF) but may be of some importance for a few domains (e.g., land purchased for environmental protection in some countries).

The EP services produced are presented by type of output (market, non-market and ancillary output) and by main categories of producers of EP services: Specialised and Non-Specialised Producers.

The upper part of Table B presents the inputs necessary for the production of EP services, i.e. the structure of the cost of production.

Table B1 presents supply and uses of the different categories of EP services. Some additions, subtractions and revaluations are made starting from domestic production:

(a) Imports are added and exports subtracted (for EP services rarely important),

(b) The value of output is made consistent with the value of uses by adding taxes on EP services (mainly by adding non-deductible VAT) and subtracting subsidies on

these services (if any). This is necessary as uses are measured at purchasers' prices in statistics (i.e. the prices consumers pay) whereas output is observed at basic prices (the price the producer receives, excluding e.g. VAT).

Table B1 has two functions:

(a) It allows checking of the consistency between data on the supply and data on the uses of EP services when these data come from different sources,

(b) It allows determination of the uses when direct and independent data on uses are not available (or, which is far less frequent in practice, determination of the supply when data on uses are available but production data are missing).

Table A describes first the uses of EP services by categories of users and gross capital formation for EP activities. Then, connected and adapted products and specific transfers not already included in the uses are added. Financing by the rest of the world is deducted in order to arrive at the national expenditure for environmental protection for each category of users or beneficiaries.

Table C describes the financing of national expenditure for environmental protection (calculated in Table A) for each category of user or beneficiary. Usually, the users finance their consumption themselves – deviations from this principle are mostly due to government transfers (e.g. investment grants for EP activities, subsidies) or due to taxes earmarked for environmental protection.

Table C1 calculates the net costs of environmental protection. Starting from the financing of current expenditure (Table C), the capital cost is added and benefits derived from environmental protection deducted. Payments of environmental taxes are also described and may be added to the net costs of environmental protection in order to calculate the total cost burden of environmental protection for each sector of the economy.

2.3 The joint OECD/Eurostat questionnaire

Following the conclusions of the OECD Group of Economic Experts in the late 1970s, the OECD published in 1990 the first results of Pollution Abatement and Control expenditures[14]. Eurostat had been collecting statistics on EPEA since 1994 in the intermediate years of the OECD data collection. Statistics on EPE have been a joint OECD/Eurostat exercise since 1996.

The Joint OECD/Eurostat Questionnaire on Environmental Protection Expenditure and Revenue is the main tool for the international collection of data on environmental protection expenditure from the statistical services in the Member States. It presents a general feature that relies directly on observation data and observable flows.

After several revisions, the Joint OECD/Eurostat Questionnaire is now based on an accounting structure rather close to that of the EPEA. The JQ adopted the CEPA as the basic classification of environmental domains used in the reporting of environmental protection expenditure. This means that each variable is broken down into a number of different environmental areas: air, wastewater, waste, soil and groundwater, noise, biodiversity and other (sum of radiation, research and development and general environmental management and other).

[14] OECD, (2003), "Pollution Abatement and Control expenditures in OECD countries", ENV/EPOC/SE(2003)1

The Joint Questionnaire includes economic variables relating both to expenditure for own-sector environmental protection activities and to financing of environmental protection in other sectors. The main six variables are investment expenditure, internal current expenditure, receipts from by-products, subsidies/transfers, fees/purchases and revenues.

It distinguishes two expenditure concepts evaluated according to two different principles: expenditure I (EXP I) according to the abater principle, and expenditure II (EXP II) according to the financing principle.

According to the abater principle, for a given sector or economic unit, expenditure comprises all expenditure (either capital or current) by the sector on the environmental protection expenditure it undertakes.

With its general feature of relying on observation data, the JQ only records actual outlays and excludes national accounts "imputed" transactions such as the consumption of fixed capital.

Expenditure accounts could be used for JQ reporting and JQ data could be used for expenditure accounts analysis, even though some extra data are needed for building a complete EPEA. To date, comparison between EPEA publications and data reported in the JQ shows that there are often differences both in terms of data quantity and in actual figures. More information could be found in the Conversion Guidelines[15].

Accordingly with the aim being to calculate the net amount of money spent by the sectors for their own activities, any economic benefits directly linked with the environmental protection activities are deducted.

EXP I = investment expenditure + internal current expenditure – receipts of by-products

According to the financing principle, for a given sector or economic unit, expenditure corresponds to what they contribute to overall environmental protection activities, regardless of the unit that executes them.

EXP II = EXP I + environmental protection services purchased from another unit – revenues from sales of environmental protection services to others + transfers paid – transfers received.

Payments of environmental taxes (energy, transport, pollution and resources taxes) are excluded from the framework, except earmarked taxes[16]. Taxes are generally used to raise funds for the government and are not destined for environmental protection. But earmarked taxes are attributed to environmental objectives. Earmarked environmental taxes are recorded as transfers.

Furthermore, whereas the JQ in principle takes into account financial transfers with the rest of the world, it does not account for imports and exports of EP services.

[15] Eurostat, (2005), "OECD/Eurostat Environmental Protection Expenditure and Revenue Joint Questionnaire / SERIEE Environmental Protection Expenditure Account: Conversion guidelines"

[16] Earmarked taxes are explained in chapter 4.6.

Table 2.1: Composition of JQ aggregates

Investment expenditure	Purchases of capital expenditure (end-of-pipe and integrated investments) and land acquisition
+ Internal current expenditure	Intermediate consumption and compensation of employees for the EP activities
- Receipts from by-products	Economic benefits linked to the EP activities
= EXP I	**Expenditure according to the abater principle**
+ (-) Transfers paid (received)	Transfers related to EP activities, including earmarked taxes
+ Fees and payments for EP services	Environmental protection services purchased from other units/sector
- Revenues from EP services	Sales of environmental protection services to other sectors/units
= EXP II	**Expenditure according to the financing principle**

Source: Eurostat, 2005 (b)

The JQ classifies the economy according to four sectors: public, industry, households and specialised producers of environmental services. The questionnaire also includes separate, more detailed tables on the business sector.

A distinction is made between, on the one hand, units that carry out environmental protection activities for third parties (General Government and Specialised Producers) and, on the other hand, units that carry out EP activities for their own uses (e.g. enterprises with their ancillary activities).

Whereas the EPEA consists of a whole system of tables of supply, use and financing of environmental services and expenditure, the JQ presents important elements of environmental expenditure in a less complex way.

Note: In the JQ concept, the national expenditure is based on the uses of environmental protection services and not on the costs of producing the services.

3. The role of the different groups of producers

This chapter describes the way environmental protection may be organised in a country and identifies the role of the institutional sectors in the different classes of the CEPA. The producers could be identified and classified according to the type of ownership, private or public, or according to their activities. A definition of Specialised Producers and General Government is then established and the differences between the JQ and EPEA are mentioned.

3.1 Environmental protection in the economy

Environmental protection is now being integrated into all policy fields with the general aim of ensuring the sustainable development of a nation. General Government has one of the most significant roles. It regulates and monitors environmental performance, it provides grants and subsidies to encourage environmentally sensitive behaviour, it encourages firms and private households to protect the environment by educating, it funds some research and development and it manages some of the nations' natural resources. General Government also provides some services that treat pollution and waste. In this way, the government is both a provider of environmental protection services (EP services) and a major source of funding for environmental protection activities carried out by itself, private companies, households and NPISH.

In general, the primary responsibility for environmental legislation and regulation is with the Ministry of the Environment. But other Ministries, e.g. Transport, Energy or Agriculture, are also involved in environmental protection and the different levels of public administration also have legislative or regulatory tasks.

In many countries, specialised local government units are involved in the implementation of government policy and in the control or provision of important EP services, such as biodiversity and landscape protection. In some countries, local governments delegate the actual provision of environmental services to private or (semi-) public corporations. In some other countries, it is the local governments themselves that provide these services, either directly or through specialised departments, as national environmental agencies or institutes for environmental research and development. For example, in the UK, governmental units provide services in the wastewater domain.

The following table gives an overview of the different situations that may coexist in a country. For an understanding of how EP is undertaken and financed in each Member State, it is useful to distinguish specialised producers from the government by the level of government they belong to: central, local, and a specific category for municipalities. The following table presents the environmental activities carried out by the different levels of government or by the different types of corporations (Specialised Producers or other industries).

Table 3.1: Organisation of environmental protection (EP)

	CEPA 1 Air and Climate	CEPA 2 Wastewater	CEPA 3 Waste	CEPA 4 Soil, groundwater and surface water	CEPA 5 Noise and vibration	CEPA 6 Biodiversity and lanscape	CEPA 7 Radiation	CEPA 8 R&D	CEPA 9 Other
Central and State government									
Ministry of the environment, other ministries: legislation, regulation, collection of taxes, payments and transfers	○	○	○	○	○	○	○	○	●
Central government specialised agencies: implementation, payment of transfers, technical aid, etc…	○	○	○	○	●	●	●	●	●
Local government									
Municipalities:									
Control	○	○	○	○	○	○			●
Supply of EP services		●	●						
Other local government, local specialised agencies: implementation, control, transfers		○	○	○	○	●			●
Corporations									
All: purchase of EP services	○	●	●	○	○	○		○	○
Specialised EP producers: production of public utilities services and EP services for other producers		●	●	○				○	○
Other EP producers: internal measures to reduce environmental impact of their activity	●	●	●	○	●	○	○	●	●

● : is typically an important component of activities and expenditure
▫ : is typically a small component of activities and expenditure
Source: Eurostat, 2002 (a)

The European System of Accounts 1995 (ESA 95[17]) gives this definition of the different levels of government[18]:

General Government (S13): Composed of entities that are engaged primarily in the production of non-market goods and services intended for individual and collective consumption and/or in the redistribution of national income and wealth, mainly financed by compulsory payments made by units belonging to other sectors. The General Government is divided into four sub-sectors, i.e. central, state, and local government in addition to social security funds. Excluded are government-owned entities that conduct commercial operations, such as public enterprises. The four sub-sectors are:

Central government: It includes all administrative departments of the central state and other central agencies whose competence extends over the entire economic territory, except for the administration of social security funds.

State government: Composed of separate institutional units exercising some of the functions of government (excluding the administration of social security funds) at a level below that of the central government and above that of the local government.

Local government: This sector comprises public authorities and/or bodies, excluding local agencies for social security funds, whose competences extend only to a local area of the country's economic territory.

Social Security Funds: This sector includes all central, state and local institutional units whose principal activity is to provide social benefits and which fulfil each of the following two criteria: a) by law or by regulation certain groups of the population are obliged to participate in the scheme or to pay contributions; b) General Government is responsible for the management of the institution in respect of the settlement or approval of the contributions and benefits independently from its role as supervisor or employer.

The example below presents, in the case of United Kingdom, how they divide the environmental responsibilities among the different levels of government.

[17] European System of Accounts 1995; http://forum.europa.eu.int/irc/dsis/nfaccount/info/data/ESA95 /esa95-new.htm

[18] http://www.ecb.int/home/glossary/html/glossg.en.html

*Example 3.1: Governmental activities in the environmental domain in **United Kingdom***

The General Government includes central government departments and local authorities, government agencies and other public bodies providing environmental protection services. Public corporations such as the Scottish Water Authorities, which are financed by fees and charges but under the control of Scottish ministers, are not part of the General Government of the National Accounts.

On the other hand, public expenditure on waste collection and disposal incurred by local authorities is funded mainly from local taxation and central government grants, together with income from fees and charges from domestic and non-domestic customers. Local authorities are therefore defined as being part of General Government, whether or not the actual service is contracted out to the private sector.

Expenditure on environmental protection by central government, other government agencies and local authorities in the United Kingdom, million pounds sterling, 2000/01

	Central government	Government agencies	Local government
Protection of ambient air	276	6	51
Wastewater management	40	43	34
Waste management	10	37	2381
Protection of soil and groundwater	57	15	73
Noise and vibration abatement	3	0	0
Protection of biodiversity and landscape	400	35	79
Protection against radiation	197	5	
R&D for environmental protection	257	8	
Other environmental protection activities	105	5	0
Education and administration	109	18	

[1] Local authorities have responsibility for the control of local air pollution under the Clean Air Act 1995.

Sources: Office for National Statistics, UK, 2002 and Department for Environment, Foods and Rural Affairs (Defra)

The organisation of EP services between the public administration and the private sector is evolving rapidly. The private sector is growing in importance due to a trend towards privatisation and outsourcing, either through increased subcontracting to private institutions or through full privatisation of environmental activities.

Note: If the data collection and analysis cover only private activities and ownership, then changes resulting from privatisation of government activities will lead to an exaggeration of the statistics. Distinctions between private and public ownership, and measurement of both, provide the information necessary to avoid such misinterpretation. See example 3.2 below.

In the case of contracting the activities, it is important not to include the expenditures of both parties as double counting will occur. See chapter 4.3.

*Example 3.2: The evolution of environmental activities according to sectors in **Germany***

This table shows the environmental expenditure (in euro mm (at current prices)) in different environmental domains according to the sector which produces the goods or services. It gives a clear example of what happens in the economy when structural changes are occurring. It shows for example how government expenditures for waste and wastewater management are decreasing while expenditures in the private sector are increasing at a steady rate.

Expenditures in different environmental domains according to the producer sectors (in euro mm)

Economic sector - Environmental domain	1995	2000	2001	2002
Production industries	8960	7070	7320	7220
Waste management	1680	1380	1600	1550
Wastewater management	2950	2490	2420	2490
Noise abatement	190	180	200	180
Protection of ambient air	4130	3020	3110	3010
Government	14110	9550	9070	9490
Waste management	5480	4170	4080	4420
Wastewater management	8440	5220	4830	4920
Noise abatement	150	120	120	130
Protection of ambient air	50	30	40	20
Privatised public enterprise	12460	16080	16470	17250
Waste management	6420	7540	7890	8340
Wastewater management	6040	8540	8580	8910

Source: http://www.destatis.de/basis/e/umw/ugrtab12.htm; Last updated on 02 November 2005

Ownership structures in the production of EP services differ widely across countries. The relationship between local governments and other Specialised Producers may also be complex. In France, for example, local governments own the installation for wastewater collection and treatment which they may put at the disposal of private Specialised Producers. Therefore, any new investment or depreciation has to be assigned to the accounts of local governments and not to the accounts of the private or public specialised firms.

The public-private partnerships

The phenomenon of public-private partnerships (PPP's) redefines the relationships and describes a new form of cooperation between the public and private spheres. It has expanded rapidly over the last years.

Public-private partnerships are complex legal arrangements designed to share the control and the risks and rewards of a set of fixed assets between a private enterprise and a public unit, normally a unit of General Government[19].

The public authorities make increasing use of them in view of the budgetary constraints with which they are confronted. In this way, they can benefit from private sector know-how. Another advantage lies in the savings made possible by PPPs as they incorporate all the stages of a project, from its design through to exploitation. The development of PPP's also forms part of the changing role of the State in the economy, as it moves away from being a direct provider of services towards the role of organiser, regulator and controller.

Two types of PPPs could be distinguished. Certain partnerships are purely of a contractual nature and others are of an institutional nature.

PPP contracts frequently generate difficult accounting decisions because, among other reasons, legal ownership of the assets may differ from operational control. There are in effect two major issues to be resolved for PPPs:

The first issue is deciding whether the private enterprise or the government is the economic owner of the fixed assets. This decision must be made on a case-by-case basis and will require intensive study of the contractual arrangements. The economic owner is determined by assessing which unit bears the majority of the risks, which receive the majority of the rewards, and which unit controls the design, use, quality, capacity, maintenance or other relevant characteristics of the asset.

The second issue is how to ensure that the proper transactions are recorded to reflect the underlying realities of the economic activities generated by the PPPs.

Partnerships recognised as independent legal entities and which are market producers are included in the non-financial corporation sector.

However, there are no guidelines in the System of National Accounts (SNA) for appropriate accounting for PPPs.

[19] Kaufmann B., Lynch R., Maier C., Pitzer J., 2006

3.2 The unit classification

3.2.1 Identification of the producers

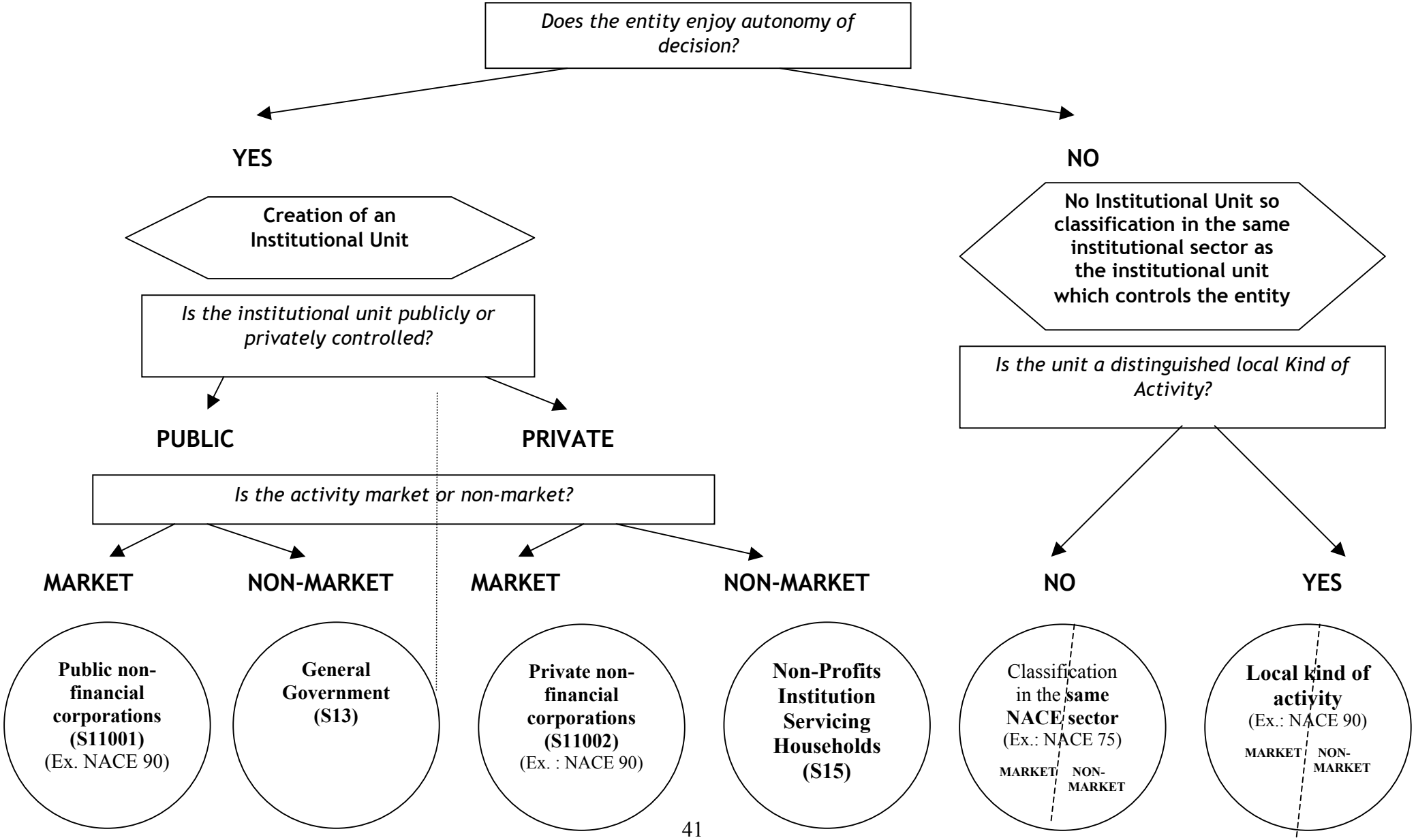
An important step in the data collection is to classify producers. It is important to be aware of how the distinction between the different groups of producers is made in order to be able to interpret the results of the data collection and processing.

In order to establish whether a producer belongs to General Government or to other sectors (mainly corporations or Non-Profit institution Servicing Households (NPISH)), three main classification criteria should be applied, i.e. the possible autonomy of decision, the kind of ownership (private or public), and the kind of output (market or non-market). In practice producers can be classified by answering to the following three questions:

- Is there autonomy of decision?
- Is it a private or public ownership?
- Is it a market or non-market activity?

The first approach to categorise the environmental protection producers is based on the difference of autonomy of decision. Figure 3.1 below shows the decision tree used in this way of classifying of producers (see ESA 95, § 3.27, Table 3.1).

Figure 3.1: Decision tree for the classification of producers



Autonomy of decision?

The first question relates to the autonomy of decision. In order to be said to have autonomy of decision in respect of its principal function, a unit must be responsible and accountable for the decisions and actions it takes[20].

As described in Figure 3.1, if a producer is dependent on another unit for his policy choices, no separate institutional unit will be created. Therefore, the producer will be classified in the same institutional sector as its mother institution.

The table below recapitulates how the public departments may be classified according to their autonomy of decision and their activity.

Table 3.2: Classification of government units

Autonomy of decision	Classification
Enjoys autonomy of decision and sells the services at economically significant prices.	A separate institutional unit should be created and classified as a corporation or quasi-corporation (non-financial corporations sector).
Does not enjoy autonomy of decision and sells the services at economically significant prices. The accounts of the municipality allow the identification of at least the value of production, intermediate consumption, compensation of employees, employment and gross fixed capital.	No separate institutional unit is created, but for the purpose of industry classification a local kind of activity unit may be created, which although being a market producer belongs to General Government.
Does not enjoy autonomy of decision and the accounts of the municipality do not allow the identification of at least the value of production, intermediate consumption, compensation of employees, employment and gross fixed capital.	No separate institutional unit is created and no local kind of activity unit can be created. The department will be included with other administrative activities and classified e.g. in NACE 75[21] (public administration).

Source: Eurostat, 2002 (a)

The main part of the EP services consists of services for the collection and treatment of waste and wastewater. They are generally produced by specialised units which are grouped together under the NACE 90 class[22]. However, the situation may differ across countries.

• If the accounts do not allow the identification of a local kind of activity unit, the department will be included with other activities of the institutional unit which controls the entity.

For example, a municipality without autonomy of decision and from which no local Kind of Activity Unit (KAU) could be created, is classified in NACE 75, public administration. This relates to production of public goods and services, providing to the users below a market-based value, financed mainly from the government budget.

• If the accounts allow the identification of at least the value of production, such as current outlays and salaries to employees or investments, a local kind of activity (KAU) can be distinguished. This producer is not separate from the institutional units it belongs to but

[20] Council Regulation (EEC) No 696/93 of 15 March 1993 on the statistical units for the observation and analysis of the production system in the Community. OJ L 76, 30.3.1993, p. 1–11.
[21] NACE 75 of NACE Rev 1.1 will be classified in NACE 81, 82, 84, 88 or 91 of NACE Rev.2.
[22] Division 90 of NACE REV 1.1 will be classified in divisions 37, 38, 39 or 81 of NACE Rev. 2.

a separate statistical unit exists and the activity could be registered in national statistical registers under the corresponding position.

For example, the KAU should be classified within the NACE 90[23], even if it belongs to the General Government, as described in Figure 3.1. Thus, for the JQ, only when the existing data sources make this kind of separation impossible, the waste and wastewater departments could be recorded under the "public sector"[24].

Public or private ownership (control)?

When a producer enjoys autonomy of decision, an institutional unit is created. The second step is thus to establish if this institution is publicly or privately controlled.

A public entity is controlled by government either through public ownership (more than 50 percent of the shares) or by special legislation, regardless of whether they produce market or non-market goods or services and regardless of whether they have autonomy of decision or not.

Then, if more than 50 percent of the shares are owned by a public institution, or if a special legislation provides it, a producer is considered as a public entity. Otherwise, it is a private producer. If autonomy of decision is acknowledged:

- A public producer who carries out a market activity is classified as a public non-financial corporation. In this case, a separate unit classified as public corporation or quasi-corporation should be created in national business registers under the corresponding NACE position.

- A public or private producer who carries out a non-market activity is classified in General Government.

For example, in Germany, municipalities or local associations enjoy autonomy for the management of wastewater and are publicly controlled. As the producers are clearly identifiable, they are nevertheless recorded under the NACE 90 and considered as public Specialised Producers.

- A private producer who carries out a market activity is classified as a private non-financial corporation.

It is the case in United Kingdom where wastewater treatment companies enjoy autonomy of decision and are entirely privately controlled. As they carry out market activities, their activities are included in the NACE 90 and they are considered as private Specialised Producers.

- A private producer who carries out a non-market activity is classified as an NPISH.

Market or non-market activity?

The classification of the producers between market and non-market sectors is sometimes a difficulty for countries which complete EPEA and JQ. The rule to distinguish both types of activities, in European countries, is based on the part of output sold at an economically

[23] Division 90 of NACE Rev.1.1 will be classified in divisions 37, 38, 39 or 81 of NACE Rev. 2.

[24] In the JQ, the label "public sector" is currently used. However, more appropriate terminology could be established, as in the ESA, by separating "General Government" and "Specialised Producers". A modification towards this labelling is proposed.

significant price, otherwise disposed of on the market, or intended for sale or disposal on the market.

A criterion used to evaluate the proportion of market output in the total output is the percentage of the production costs covered by the price used for the sale of the product. According to the ESA 95, if this percentage is more than, or equal to, 50 percent, the activity is considered as a market activity. This is known as the 50 percent rule. The case of Denmark below illustrates how to implement this method.

*Example 3.3: The identification of market producers: the 50 percent rule in **Denmark***

Denmark uses the 50 percent rule to distinguish market and non-market producers.

By this rule, market products are products that are sold at a price which is economically significant, so the sale covers more than 50 percent of the production costs. The price considered is the price not including VAT or other taxes or subsidies. Thus, a producer is considered as a market producer if more than 50 percent of the corporation's costs are covered by sales.

The corporations that are not integrated in the public accounts are all considered as market producers, fulfilling the 50 percent criterion.

Source: Working documents of the Working Group "Environmental Expenditure Statistics", 2006

Some countries encounter difficulties in using the 50 percent rule. They have found other methods to help them in the evaluation of the type of activity, even if the 50 percent rule stays the theoretical general rule:

- Assumption/convention on the nature of the producers' activities (see the case in Italy, Austria and Belgium);

- Use of NACE code in business register (see the case in the Netherlands).

*Example 3.4: The identification of market producers: the case in **Italy***

Italian approach for calculating public expenditure by COFOG for ESA 95 purposes is based on assumptions about the nature of producers (General Government units) and/or activities they carry out.

For example, as far as municipalities are concerned, waste management is considered as market. Another example is that of the local public authorities responsible for the management of natural parks: their activity is entirely classified as non-market.

Source: Working documents of the Working Group "Environmental Expenditure Statistics", 2006

*Example 3.5: The identification of market producers: the case in **Austria***

In general, Austria assumes that the central government and the provincial governments only provide non-market services. But there are also some market activities whose revenues are earmarked in the budgets. For example, the central government has a fee for the restoration of landfill sites.

At the level of municipalities, a distinction between market and non-market activities can be based on budget analysis. The activities of the municipalities are assumed to be non-market activities and the activities of the enterprises owned by the municipalities are assumed to be market activities.

If the information is not available, Austria classifies private units as market and public as non-market.

Source: Working documents of the Working Group "Environmental Expenditure Statistics", 2006

*Example 3.6: The identification of market producers: the case in **Belgium***

For the local authorities, the non-market output is obtained by subtracting the market output from the total output. Market output is, by convention, the sum of:

The sale of non-durable goods and services;

The refunding of maintenance works of the public roads and waterways;

The local taxes that are considered to be the sales of waste management services (according to the Belgian National Bank to build the National Accounts).

Market output from 1997 to 2002 was found to be 74.27 percent, 73.07 percent, 69.13 percent and 68.96 percent for the period 2000-2002.

Source: Federal Planning Bureau, 2005

*Example 3.7: The identification of market producers: the case in **The Netherlands***

Statistics Netherlands distinguishes market and non-market activities by using the NACE-code in their business register and by using a special attribute to characterise public and private sector in their business register (the sector code).

General Government is as defined in the JQ and includes non-market activities mainly regrouped in the NACE 75. Specialised Producers are also as defined in the JQ and include market activities mainly regrouped in the NACE 90 in the business register.

Source: Working documents of the Working Group "Environmental Expenditure Statistics", 2006

3.2.2 NACE classification of the Specialised Producers

This sub-chapter makes reference to the NACE Rev. 1.1. However, as the codification will change after 2008, the correspondences between the NACE Rev. 1.1 and the new NACE 2 are presented in the sub-chapter 3.3.

The Specialised Producers' activities are mainly activities within NACE 90 such as (NACE Rev 1.1):

- 90.01 Collection and treatment of sewage;
- 90.02 Collection and treatment of solid waste;
- 90.03 Sanitation, remediation and similar activities.

Specialised Producers may be found in statistical surveys of industries other than class 90 of the NACE Rev. 1.1.

Firms categorised in classes 37.10 and 37.20 (recycling) also provide some services in the waste management domain. Surveys covering these firms should distinguish between the production of recycled materials and waste treatment services. The first activity is a production activity that ends up in sales of secondary materials, but the second activity includes payments for accepting the waste for treatment and recycling. Only the waste treatment services should be entered in the EPEA.

The same problem arises with class 41 of the NACE Rev 1.1 (collection, purification and distribution of water). Water supply and the collection and treatment of wastewater may be integrated, so that the same firms provide the two types of services. The industrial surveys are generally organised on the basis of firms and not facilities. Therefore, most of the output of wastewater collection and treatment services appears as a secondary output of water supply firms.

However, firms belonging to class 51.57 (wholesale of metal and non-metal waste and scrap and materials for recycling) and class 45.11 (demolition and wrecking of buildings) may also have some secondary output of waste treatment services.

Environmental consultancy and also environmental testing and analysis firms are mainly classified in NACE division 74 (other business activities).

Almost all NACE classes may have a secondary output related to environmental services. So the examination of the production statistics for the firms or facilities of class 90 of NACE Rev.1.1 should be complemented by the examination of secondary EP output in other classes.

Note: The presence of government units among the Specialised Producers may create some double counting problems. If different data sources are used, some municipalities' expenditure could be included in government expenditure and in the Specialised Producers' expenditure. For more information, see chapter 4.3.

*Example 3.8: The NACE classification: the case of wastewater collection and treatment in **France***

In France, water supply and collection and treatment of wastewater are integrated. As the main activity of these firms is water supply, they are classified in class 41.00 of NACE Rev. 1. Therefore, most of the output of wastewater collection and treatment services appears as a secondary output of the water supply firms. In 1997, sales resulting from the secondary output of firms classified in class 41.00 of NACE Rev.1.1 represented 26.3 percent of the total sales of the NACE class[25].

Source: Eurostat, 2002 (a)

*Example 3.9: Wastewater treatment in **Lithuania***

Expenditure for water supply and wastewater treatment is often paid on the same bill, whereas the costs that are significant for environmental protection aspects are only the treatment costs. Thus, there is a question of separation between the two cost types, which can be difficult.

After consultation with enterprise consultants, Statistics Lithuania decided that this sum could be divided approximately in two parts, which would make 50 percent for wastewater treatment.

However, the Lithuanian Water Suppliers Association was contacted, who supplied information about the tariffs on water supply and wastewater management services carried out. Using these data, Statistics Lithuania have calculated the percentage of wastewater treatment in total water supply and wastewater treatment[26].

Source: Statistics Lithuania, 2005

*Example 3.10: Waste and wastewater treatment in **Hungary***

Every year, the Hungarian Central Statistical Office asks municipalities to name the organisations that provide municipal waste treatment, water supply and sewerage. The office matches this information with the business register and, with this list, makes a survey on municipal waste and wastewater collection and treatment. This system provides a full picture of the organisations providing municipal waste and wastewater services in Hungary.

In 2000, the results indicated that only 25 percent of the organisations involved in municipal waste collection were classified under NACE 90, and that 41 percent were classified under the category of public administration (class L). However, in terms of waste volumes, the organisations classified under the class 90 collected 84 percent of the total volume.

For wastewater, in 2000, 14 percent of the organisations were classified under NACE 90 and collected 49 percent of the wastewater. In Hungary, most of the companies providing wastewater services are classified in NACE 41 because their main activity is water supply. Thus 50 percent of the organisations were classified under class 41 (water supply) and collected 48 percent of the wastewater[27].

[25] EUROSTAT, (2002), "SERIEE : Environmental Protection Expenditure Accounts: Compilation guide"
[26] Statistics Lithuania, (2005), "Data collection project on environmental protection expenditure", Vilnius
[27] EUROSTAT, (2002), "SERIEE : Environmental Protection Expenditure Accounts: Compilation guide"

To date, Hungary cannot separate the environmental expenditure of organisations with water supply activities because it is usually the same company that provides water supply and wastewater services.

Source: Eurostat, 2002 (a)

3.2.3 Classification of producers: differences between JQ and EPEA

The coverage of units in the EPEA and the JQ is actually almost identical although the terms used differ. In the JQ, the term "public sector" is used. However, two main differences exist between the classification of producers in the EPEA and the JQ.

- In the EPEA, Specialised Producers are strictly those which carry out EP activities as their main activity whereas secondary activity producers are also classified as Specialised Producers in the JQ;

- In the EPEA, the public Specialised Producers may include market producers which depend upon an institutional unit classified in General Government whereas "public sector" producers refer only to non-market producers in the JQ.

Table 3.3 below presents the correspondence between the EPEA and the JQ classification in terms of economic units.

Note: The EPEA is a broader framework than the JQ and more consistent with national accounts, it is preferable to use the EPEA framework as a foundation for environmental expenditure reporting.

In other words, the JQ and the EPEA record largely the same EP expenditure, but they do not necessarily record it under identical producer groups. As an example, while both record ancillary EP activities under the sector in question, secondary activities are allocated to different producer groups.

Table 3.3: Classification of economic units in the JQ and EPEA

EPEA	JQ
Specialised Producers:	
- General Government	
Non-market	Public sector
Market without autonomy of decision	Public Specialised Producers
- Other market producers	
Public firms and similar	Public Specialised Producers
Private	Private Specialised Producers
Non-Specialised Producers:	
- With secondary EP output	Public or private Specialised Producers
- With ancillary EP output	Business sector
- Without ancillary or secondary EP output	Business sector

Source: Eurostat, (2005) (b)

To summarise,

Specialised Producers:

In the EPEA, all producers whose principal activity is the production of EP services, regardless of whether they belong to the private or public producers group or if they carry out market or non-market activities.

In the JQ, all units (including NPISH) which produce market environmental protection services regardless of whether they belong to the private or public producer group and regardless of whether this production is the principal activity or not.

Public sector: In the JQ, those units which carry out non-market activities (including Non Profit Institution Servicing Households).

General Government: All institution units which produce services delivered free or at a non-economically significant price for individual or collective consumption AND which are mainly financed by compulsory payments made by units belonging to other sectors AND do not enjoy autonomy of decision. It corresponds to the code S13 of ESA 95.

Governmental specialised producer: In the EPEA, entities controlled by government either through public ownership (more than 50 percent of the shares) or by special legislation, regardless of whether they produce market or non-market goods or services AND regardless of whether they have autonomy of decision or not.

Public corporations: Market producers with no autonomy of decision that are subject to control by government units (according to specific legislation or to the percentage of the share retained by the government).

Local kind of activity unit: Enterprise, or a part of an enterprise, corresponding to a local unit, which engages in only one kind of (non-ancillary) productive activity or in which the principal productive activity accounts for most of the value added. This type of units does

not enjoy autonomy of decision.

Market products: Products and services which are sold at a price which is economically significant, so the sale covers more than 50 percent of the production costs. The price considered is the price not including VAT or other taxes or subsidy (this includes services).

Non-market products: Products and services that are provided at a economically insignificant price.

Principal activity: Activity that represents the greater part of the Gross Added Value of the producer.

Secondary activity: Activity that does not represent the greater part of the Gross Value Added of the producer.

Ancillary activity: Activity that is carried out for internal uses and not for sale to other consumers.

3.3 Modification in the NACE classification

Some modifications of the NACE categories will take place at the beginning of 2008. According to this NACE Rev 2, replacing the NACE Rev 1.1, activities relating to environmental management will be re-categorised.

A new category will regroup most of the environmental activities that were classified through NACE 41, 90, 37 or other business activities.

NACE code Rev 1.1	Detailed description	New NACE code	Details	Comments
2330	Processing of nuclear fuel	3812	Collection of hazardous waste	Collection and treatment of radioactive nuclear waste
2330	Processing of nuclear fuel	3822	Treatment and disposal of hazardous waste	Includes: - treatment, disposal and storage of radioactive nuclear waste including: * treatment and disposal of transition radioactive waste, i.e. decaying within the period of transport, from hospitals * encapsulation, preparation and other treatment of nuclear waste for storage
3710	Recycling of metal waste and scrap	3831	Dismantling of wrecks	Includes: - dismantling of automobiles
3710	Recycling of metal waste and scrap	3832	Recovery of sorted materials	Includes: - reclaiming metals out of photographic waste, e.g. fixer solution or photographic films and paper
3720	Recycling of non-metal waste and scrap	3832	Recovery of sorted materials	All
4100	Collection, purification and distribution of water	3600	Water collection, treatment and supply	
9001	Collection and treatment of sewage	3700	Sewerage	
9002	Collection and treatment of other waste	3811	Collection of non-hazardous waste	Collection of non-hazardous waste
9002	Collection and treatment of other waste	3812	Collection of hazardous waste	Collection of hazardous waste

9002	Collection and treatment of other waste	3821	Treatment and disposal of non-hazardous waste	Treatment and disposal of non-hazardous waste Production of compost from organic waste
9002	Collection and treatment of other waste	3822	Treatment and disposal of hazardous waste	Treatment and disposal of hazardous waste
9003	Sanitation, remediation and similar activities	3811	Collection of non-hazardous waste	Collection of refuse in litter-bins in public places
9003	Sanitation, remediation and similar activities	3900	Remediation activities and other waste management services	Decontamination of soils and groundwater at the place of pollution, either in situ or ex situ, using mechanical, chemical or biological methods Decontamination and cleaning up of surface water following accidental pollution, e.g. through collection of pollutants or through application of chemicals Cleaning up oil spills on land, in surface water, in oceans and seas - including coastal seas Clearing of mines and the like (including detonation) Other specialised pollution control activities n.e.c.
9003	Sanitation, remediation and similar activities	8129	Other cleaning activities	Outdoor sweeping and watering of streets, squares, paths, markets, public gardens, parks etc. Snow and ice clearing on highways, airport runways, including spreading of salt or sand etc. Rental of lavatory cubicles

Source:
http://forum.europa.eu.int/irc/dsis/nacecpacon/info/data/en/nace%20correspondance%20table.htm

4. Definitions and classifications

Users of statistics often compare and analyse statistics from different sources, hoping to obtain harmonised statistics that will be comparable throughout the world. Within this global context, which, of course, is still a long way off, various 'levels' of harmonisation can be distinguished:

- According to the concepts of the EU statistical system, data supplied by EU Member States should add up to the EU aggregates. This is the vertical dimension of European harmonisation. National statistical offices should ideally use identical terminology, concepts and definitions in their publications, and these should be the same as those used in EU publications, so as not to confuse users but to enable them to compare and link data from different countries and different sources.

- The various subsystems within the EU system should be mutually consistent – e.g. environmental protection expenditure should be consistent with the Environmental Protection Expenditure Accounts (EPEA). The EU system should be consistent with the other international systems, such as those of the UN or the OECD. This is the horizontal dimension of international harmonisation.

To make data comparable, it is necessary to define what is to be included and excluded. Harmonisation is possible only if there is a consistent system in which each data collection and reporting system complies as closely as possible with internationally established standards and concepts.

Statistics on environmental protection expenditure are concerned with the economic aspects of environmental activities. It is important to link the information as far as possible to general standardised classifications and common definitions, such as the activity classification NACE and the framework of ESA 95.

The following paragraphs present the definition and the methods of classification of environmental activities and the various environmental expenditures recorded in the JQ and the EPEA.

4.1 Environmental protection activities

4.1.1 Definition

The ESA 95 defines an **activity** as what takes place when resources such as equipment, labour, manufacturing techniques, information networks or products are combined, leading to the creation of specific goods or services. An activity may be principal, secondary or ancillary, according to how much of the Gross Value Added it generates and the units which will use the goods or services.

Environmental protection regroups all activities (involving the use of equipment, labour, manufacturing techniques and practices, information networks or products) where the main purpose is to collect, treat, reduce, prevent or eliminate pollutants and pollution or any other degradation of the environment due to pressure from human activities. The 1994 SERIEE manual refers to these as "characteristic activities".

This definition implies that actions and activities must satisfy the primary purpose criterion to be included under environmental protection, i.e. that environmental protection is the

prime objective of an activity. Hence, excluded from the field of environmental protection are activities that, while beneficial to the environment, primarily satisfy technical needs or the internal requirements for hygiene or security of an enterprise or other institution (1994 SERIEE § 2007). Furthermore, for some expenditures there might be differences in countries in regard to whether an expenditure is to be handled as an EPE or not, and in regard to which CEPA code is the correct one (please see the Note below).

The label of budget lines is often not sufficient to classify the expenditures and decide whether this is an EPE or not or if a share of the budget line includes EPE. More information describing the activity actually carried out is usually needed. That can be derived sometimes from the budget itself or from other sources, such as contracting people.

Note: Some of the problems in the classification issue encountered in countries are:

- Protection of biodiversity and landscape versus Natural Resources Management: If the purpose is conservation of biodiversity or landscape, it is considered as an EPE. Otherwise, it is considered as Natural Resource Management. All expenditure relating to conservation of biodiversity or landscapes that is commercial only is also excluded from the EPE; i.e. liming of rivers for commercial fishing purposes. However, in most cases, it is not straightforward to decide whether the purpose of expenditure is mainly economic or environmental. An evaluation is thus needed.

- Items relating to energy: Activities that the government is involved with concerning energy savings or efficiency basically only relates to reducing climate change. However, there needs to be a distinction between government actions and businesses. Businesses are, to a large extent, investing in these types of equipment to reduce their costs and not due to environmental concerns and they would not be EPE.

- Purpose of same activity in different countries: For some activities, it could be wrong to provide only one possibility for which CEPA an activity falls under. For example, in the case of liming, the purpose is different in the UK compared to Norway. In the UK, it seems that the purpose of liming is maintenance of lakes/farming while in Norway, the main purpose of liming is to restore the fish stocks in order to improve the fishing conditions in lakes and rivers.

Tables 4.1 and 4.2 below present some budget items and political programmes where the environmental purpose is clearly identified or where an evaluation of the environmental share must be undertaken. Experts should be consulted to retrieve the appropriate share of expenditure. Other examples are presented in Annex 3 of this guide.

The labels of budget items/programmes are drawn from the ONS report 2002 and from the SCB report 2005[28].

[28] ONS, (2002), "Environmental protection expenditure by the UK General Government – 1996/97 to 2000/01"; SCB, (2005), "Public environmental protection expenditures and subsidies in Sweden"

Table 4.1: Environmental share of some budget items/programmes

Budget item/programme	Description	Environmental domain (CEPA) if classified as EPE	Environmental share of the item
Energy Efficiency Best Practice	Provision of advice for the adoption of energy saving schemes	Protection of ambient air and climate (CEPA 1)	100%
Cleaner Vehicles Programmes	Expenditures on encouraging the use and development of greener cars	Protection of ambient air and climate (CEPA 1)	100%
Freight grants	Capital grants to encourage use of rails rather than road freight	Protection of ambient air and climate (CEPA 1)	100%
Rural sewerage	Expenditures by local authorities on provision of sewerage services in rural areas	Wastewater management (CEPA 2)	100%
Waste collection and disposal	Expenditures by local authorities primarily on municipal waste	Waste management (CEPA 3)	100%
Contaminated land	Expenditure on the remediation of contaminated land	Protection and remediation of soil, groundwater and surface water (CEPA 4)	100%
Water quality monitoring	Expenditures by the Environment Agency on monitoring river water quality	Protection and remediation of soil, groundwater and surface water (CEPA 4)	100%
Agri-environmental spending	Schemes encouraging farmers to act in an environmentally sensitive way	Can cover all CEPA activities but the main purpose principle leads to a restriction of the domains concerned: Protection and remediation of soil, groundwater and surface water (CEPA 4) OR Protection of biodiversity and landscape (CEPA 6)	Evaluation of share needed
Natural Nature Reserve Management grants	Contributions by Government Agencies	Protection of biodiversity and landscape (CEPA 6)	100%

Table 4.2: Environmental share of some subsidies programmes

Environmentally motivated subsidies	Environmental domain (CEPA) if classified as EPE	Environmental share of the item
Emission-reducing subsidies		
Different supports in the climate area	Protection of ambient air and climate (CEPA 1)	100%
Supports for climate investments	Protection of ambient air and climate (CEPA 1)	100%
Energy-related subsidies		
Investment subsidy to reduce the use of energy	Protection of ambient air and climate (CEPA 1)	100%
Investment subsidy for renewable energy	Protection of ambient air and climate (CEPA 1)	100%
Support to introduce windpower, etc, on the market	Protection of ambient air and climate (CEPA 1)	100%
Resource-related subsidies		
Environmental research	R&D for environmental protection (CEPA 8)	100%
Measures for improving the environment in the agricultural sector	Protection of landscape and biodiversity (CEPA 6)	Evaluation of share needed
Support to sanitation of polluted areas	Protection and remediation of soil, groundwater and surface water (CEPA 4)	100%

A clear distinction must be made between purpose and effect. Actions and activities undertaken for non-environmental purposes can have positive environmental effects and should not be included. Thus EP concept does not encompass all expenditure that has a positive effect on the environment, but only that which is carried out with the purpose of protecting the environment.

Table 4.3 below presents some budget items that are clearly not considered as environmental expenditures or where further analysis is needed.

Table 4.3: Budget lines not classified as EPE

Budget line classified as non EPE	
Countryside conservation	If the information available makes it possible to establish that this expenditure has, as its main purpose, mainly the access to the countryside, it is NOT considered as EPE (however, expenditure for the general management on Natural Parks (without any further detail on the nature of the activities carried out) are included in the EPEA scope)
Natural heritage	CEPA 6 excludes protection and conservation of historical monuments and the label as such does not make it possible to establish whether the expenditure concerns only a natural object (CEPA 6.2) or also historical heritage. Thus, further analyses are needed.

Activities such as water supply, or saving of energy or raw materials are regarded as the management of natural resources and are excluded from environmental protection. This expenditure has to be accounted for in another satellite account of the SERIEE system, separate from the EPEA, specifically devoted to expenditure for the use and management of natural resources. However, such activities are considered environmental protection activities and accounted for in the EPEA only to the extent that they mainly aim at environmental protection. An important example is recycling which is included to the extent that it constitutes a substitute for waste management (1994 SERIEE § 2008).

Activities: What take place when resources such as equipment, labour, manufacturing techniques, information networks or products are combined, leading to the creation of specific goods or services.

Environmental protection activities: Activities (involving the use of equipment, labour, manufacturing techniques and practices, information networks or products) where the main purpose is to collect, treat, reduce, prevent or eliminate pollutants and pollution or any other degradation of the environment due to pressure from human activities.

It is sometimes difficult to determine the purpose of an action, in particular for General Government. In example 4.1, Sweden explains that this is the case, for example, with an information campaign related to a specific environmental field. General Government could launch an energy campaign in order to reduce impact on the climate and not to reduce costs. This kind of expenditure could be considered as an EPE and be classified in “other activities” related to the protection of ambient air and climate. In the case of industries where this kind of activity is more often performed in order to reduce costs, as the primary purpose is not environmental, the expenditure related to this activity is not considered as EPE.

*Example 4.1: The identification of purposes of activities in **Sweden***

As the environmental activities within General Government are different from those in the manufacturing sector, a number of activities cover several environmental fields. Therefore, it is not possible to classify them in a single domain.

The purpose of performing an environmental activity from the industrial sector may also be different from performing one for the public. For example, the purpose of using energy more efficiently may not be for environmental reasons for the industrial sector, whereas campaigns for energy efficiency executed by General Government are mostly for environmental reasons. and not to reduce energy costs. For example, in the case of an enterprise investing in a new automatic door for energy saving reasons, it can generally be concluded that they do it because they reduce their energy costs. In the case of the government funding energy saving equipment and material, it is generally done for climate reasons.

The consequence is that some data are not allocated to any environmental domain. Thus, expenditure which is not distributed in an environmental domain is classified in the domain "other"; expenditure clearly tending towards an existing CEPA domain is classified as EPE. An example is the governmental support for renewable energy which has been classified as EPE and put in the CEPA category of ambient air and climate. Energy campaigns administered by General Government are performed in order to reduce impact on the climate and not to reduce costs or dependence on foreign energy supply.

Source: Statistics Sweden, 2005 (b)

4.1.2 Classifications

The Classification of Environmental Protection Activities (CEPA)

In 1994, European statisticians and accountants adopted a common classification of environmental protection activities that was replaced in 2000 by an improved version. CEPA 2000 is a generic, multipurpose and functional classification for environmental protection. It is used for classifying not only activities for environmental protection, but also products. The activities are generally classified by the environmental domain which is protected (air, waste, nature protection, etc.) and then by type of measure (prevention, reduction, etc.).

For example, the analysis of government budgets and accounts requires the coding of items of government environmental protection expenditure into CEPA. Some of these expenditure items will be transfers such as subsidies or investment grants whereas others will be inputs into an environmental protection activity (for example wages and salaries). The compilation of environmental expenditure accounts requires determining environmental protection activities and their output of environmental protection services by categories of CEPA.

Environmental protection activities are production activities in the sense of National Accounts, i.e. combining resources such as equipment, labour, manufacturing techniques, information networks or products to create an output of goods and services. An activity may be principal, secondary or ancillary. The management of natural resources and the prevention of natural hazards are not included in CEPA. These categories of activities are covered by broader frameworks.

The level 1 structure of the CEPA is the CEPA classes, commonly referred to as environmental domains. The main function of most 2-digit and 3-digit headings in CEPA is to guide classification into the following classes:

1: Protection of ambient air and climate

2: Wastewater management

3: Waste management

4: Protection and remediation of soil, groundwater and surface water

5: Noise and vibration abatement

6: Protection of biodiversity and landscape

7: Protection against radiation

8: Research and development

9: Other environmental protection activities

9.1: General environmental administration and management

9.2: Education, training and information

9.3: Activities leading to indivisible expenditure

9.4: Activities not specified elsewhere

Note: It should be noted that if it is possible to specify the environmental field, the activity must be classified in the environmental domain concerned. Each domain is composed of sub-categories including the use of cleaner technologies or products, the treatment or prevention of pollution and the measurement or control of pollution. A last sub-class regroups the "other activities" related to the environmental domain. This sub-class includes activities separable from other activities related to the same class and from similar activities related to other environmental domains.

The following Table 4.4 presents the links between the CEPA domains used in the EPEA and those used in the JQ.

Table 4.4: Environmental domains

CEPA used in EPEA	CEPA used in JQ
Protection of ambient air and climate	Protection of ambient air and climate
Wastewater management	Wastewater management
Waste management	Waste management
Protection and remediation of soil, groundwater and surface water	Protection and remediation of soil, groundwater and surface water
Noise and vibration abatement	Noise and vibration abatement
Protection of biodiversity and landscapes	Protection of biodiversity and landscapes
Protection against radiation	Other
Research and development	
Other environmental protection activities	

Source: Adapted from Eurostat, 2005 (b)

The Classification Of Functions Of Government (COFOG)

The Classification of Functions of Government (COFOG) is another central classification of national accounts. It classifies General Government transactions according to purpose and thus permits the identification of actual or imputed expenditure made in connection with particular functions or to achieve particular purposes. The function of environmental protection in the COFOG is based upon the Classification of Environmental Protection Activities (CEPA).

COFOG includes a full division dedicated to environmental protection. Within this division 6 groups are distinguished:

05.1: Waste management

05.2: Wastewater management

05.3: Pollution abatement

05.4: Protection of biodiversity and landscape

05.5: R&D environmental protection

05.6: Environmental protection not elsewhere classified

The breakdown is based upon the CEPA. The links between the classification system and the categories of expenditures used in COFOG and CEPA are presented in Table 4.5 below. It helps to understand which expenditures are included.

Table 4.5: Correspondence table between COFOG and CEPA

COFOG (05 – Environment Protection) (ESA 95)	CEPA 2000 (SEEA, EPEA, JQ)
05.1.0 Waste management	3. Waste management
05.2.0 Wastewater management	2. Wastewater management
05.3.0 Pollution management	1. Protection of ambiant air and climate
	4. Protection and remediation of soil, groundwater and surface water
	5. Noise and vibration abatement
	7. Protection against radiation
05.4.0 Protection of biodiversity and landscape	6. Protection of biodiversity and landscape
05.5.0 Research and development environment protection	8. Research and development
05.6.0 Environment protection n.e.c.	9. Other environmental protection activities

As Table 4.5 shows, there is a strict correspondence between CEPA 2000 and division 05 of COFOG, while the former is more broken down than the latter.

However, as all expenditure should be classified under one and only one position of the classification, in some cases, EP expenditure or multi-purpose activities may be classified under another item. As a consequence, some other positions of COFOG may also be relevant for the identification of the EP expenditure. For example, it could be economic aid to developing countries and countries in transition, overall planning and statistical services, agriculture, multi-purpose development projects, housing development or cultural services. This point is tackled in more details in chapter 5.

In principle, the units of classification are individual transactions. But this rule needs to be followed strictly only in the case of capital and current transfers and net acquisition of financial assets. In other cases, all the outlays of a particular administrative unit will be given the COFOG code assigned to that unit, thus making the ministry or agency the de facto unit of classification for most outlays[29].

It is worth noting that the production and transmission of data by COFOG is compulsory according to the ESA 95 regulations[30], while for the time being the EPEA is not required by regulation.

As the environmental accounts are satellite accounts to the national accounts, as far as possible they should be consistent with these national accounts. It is therefore natural to use these data as the starting point in order to determine total intermediate consumption and other taxes on production, total compensation of employees, total gross fixed capital

[29] Helen Stone Ice, (2002), "A note on the classifications of expenditure according to purpose", John Hopkins University, London

[30] In particular EU member states transmit data by COFOG to the European Commission through Table 11 of the ESA 95 transmission programme.

formation and other capital uses, total current transfers and total capital transfers given for this function.

Note: As there is a constant demand for reducing reporting obligations and to reduce the workload on national statistical offices, the COFOG source would be a most welcome source to use. However, the current COFOG coding is too rough and is not sensitive enough for either EPEA compilations or JQ reporting. A close cooperation between experts both nationally and internationally could improve the situation. It is therefore recommended to use the COFOG as a data source.

4.2 Environmental Protection Expenditure

Environmental protection expenditure (EPE) is the sum of capital and current expenditure carried out in order to protect the environment. This concept corresponds in practice to a number of different aggregates according to the perspective under which the phenomenon is analysed.

In a national account perspective, economic activities and the related transactions are analysed from both supply and use sides, and also under a financing perspective. EPEA, which strictly follows the national accounts, describes environmental protection expenditure according to all these points, thus leading to the calculation of various aggregates that are mainly the output of EP services, the national EP expenditure and the financing of national EP expenditure by institutional sector.

From the supply side, environmental protection expenditure concerns all the current transactions (costs of production) and capital expenditure (gross capital formation) carried out in order to produce EP services sold on the market (whatever the name given to the price), provided free of charge or produced for own use (ancillary).

From the use side, environmental protection expenditure includes:

- The domestic uses of EP products (goods and services). These EP products are either services, connected or adapted products. Uses are either final uses or intermediate consumption;

- The domestic gross capital formation for environmental protection;

- Those transfers for EP that are not already reflected in the expenditure recorded under the two previous categories.

The sum of these components gives total domestic EPE. Adding transfers to the rest of the world and deducting transfers received from the rest of the world leads to national environmental protection expenditure. This aggregate is constructed in a way to avoid double counting and makes the sum comparable with standard national accounts aggregates such as gross domestic product.

From a financing point of view, the national environmental protection expenditure arising from each institutional sector includes the expenditure for the use of EP products and gross capital formation financed through own economic resources plus transfers given to other sectors for financing EP expenditures.

From the perspective of the JQ, as mentioned in chapter 2, two expenditure concepts are distinguished, which correspond to two different principles for evaluating EPE: the abater principle and the financing principle.

Expenditure according to the abater principle is reflected in the aggregate "expenditure I". For a given sector or economic unit, expenditure according to this principle adds up all expenditures (either (internal) current or capital) that the sector makes for the environmental protection activities it conducts.

Expenditure is also presented according to the financing principle, which is recorded in the aggregate "expenditure II". Here, for a given sector or economic unit, the expenditure II concept corresponds to its financial contribution to overall environmental protection activities, whatever the unit that executes them. Consequently, for a given sector or economic unit, expenditure according to the financing principle is equal to EXP I plus any environmental protection services purchased from another sector or unit, less revenues from sales of environmental protection services to others. Transfers related to environmental protection, either paid or received, are equally taken into account.

There is no exact correspondence between EPEA and JQ aggregates due to the fact that the expenditure concepts adopted within the two systems are similar but not equal.

Table 4.6 below shows a summary comparison of the key variables in the EPEA and the JQ.

Table 4.6: Comparison of key variables in JQ and EPEA

EPEA	**JQ**
Expenditure variables	
Intermediate consumption (IC):	
Of which EP services	Fees/purchases
Other Intermediate Consumption	Internal current expenditure
Compensation of employees	
Consumption of fixed capital	(Not recorded)
Gross fixed capital formation	Total investments
Other capital uses (land)	
Financing variables	
Specific transfers not related to production	Subsidies/transfers
Transfers related to production:	
Current transfers	
Capital transfers	
Earmarked environmental taxes	
Market EP output (sales)	Revenue from sale of environmental services
(not separately recorded but deducted from cost of production)	Receipts from by-products

Source: Eurostat, 2005 (b)

In the following sub-chapters, the variables to be accounted for in EPEA and JQ, concerning in particular Specialised Producers and General Government, are dealt with in details. Variables are described starting from the EPEA which is much more detailed than the JQ. Variables are grouped in four main categories:

- Transactions for the production of EP services (see Table 4.7, § 4.3);

- Transactions for the use of EP services and goods (see Table 4.8, § 4.4);

- Specific transfers (see § 4.5);

- Taxes (VAT, earmarked environmental taxes, other environmental taxes) (see Table 4.10, § 4.6).

A detailed comparison of these groups of variables in the EPEA and JQ is made respectively in Tables 4.7, 4.8, 4.10. For each variable, it is specified which ESA 95 variable it belongs to.

4.3 Components of measuring EP services: the production side

Table 4.7 below presents the variables relating to the transactions for the production of EP services that must be accounted for in EPEA and the JQ.

Table 4.7: Detailed comparison of EPEA and JQ variables: transactions of Specialised Producers for the production of EP services

EPEA Table B: transactions of Specialised Producers (both public and private)	ESA 95 Variables		JQ aggregates and variables (Table 4 – Specialised Producers)	
	Code	Description	Aggr.	Variable
1 Intermediate consumption	P2	Intermediate consumption		
1.1 of which EP services	P2	Intermediate consumption	EXP II	Fees/purchases of EP services
1.2 of which adapted and connected products	P2	Intermediate consumption	EXP I	Internal current expenditure
1.3 of which other Intermediate consumption	P2	Intermediate consumption	EXP I	Internal current expenditure
2 Compensation of employees	D1	Compensation of employees	EXP I	Internal current expenditure
3 Taxes on production	D29	Other taxes on production		
4 Less subsidies on production	D39	Other subsidies on production		
5 Consumption of fixed capital	K1	Consumption of fixed capital		
6 Net operating surplus		(Balancing item)		
7 Output (basic prices or cost of production)	P1	Output		
7.1 Non-environmental output	P1	Output	EXP I	Receipts from by products
7.2 Environmental protection output	P1	Output		
7.2.1 non-market	P13	Other non-market output		
7.2.2 market	P11	Market output		
7.2.3 ancillary	P12	Output for own final use		
8 Current EP resources				
8.1 market output (sales)			EXP II	Revenues from sales of EP services
8.2 transfers [1]	D3	Subsidies	EXP II	Subsidies/transfers (received) [2]

		D7	Other current transfers		
9	Capital transactions				
9.1	Gross fixed capital formation	P51	Gross fixed capital formation	EXP I	Investment expenditures
9.2	Other capital uses (land)	K2	Acquisitions less disposals of non-financial non-produced assets	EXP I	Investment expenditures
9.3	Investment grants received	D92	Investment grants	EXP II	Subsidies/transfers (received) [2]
9.4	Other capital transfers received	D99	Other capital transfers	EXP II	Subsidies/transfers (received) [2]
10	Labour inputs				
11	Stock of fixed assets	AN11	Fixed assets		
		+AN2	+Non-produced assets		
12	Financing by producers [3]				

[1] These transfers do not exist for Specialised Producers belonging to corporation sector (S11) and are often small for those belonging to General Government (S13).

[2] A corresponding amount should be recorded in Table 1 of JQ as Subsidies/transfers paid by General Government (EXP II).

[3] This is a calculated item of Table B of EPEA that represents the part of the total EP expenditure financed by the producer. This concept corresponds ideally to the EXPII of JQ, but in practice the former differs from the latter due to those transactions that are accounted for in the EPEA only and not also in JQ.

4.3.1 Intermediate consumption

Intermediate consumption is one of the main components of the costs of production (Table 4.7). It includes the use of energy, material, maintenance for measures made to protect the environment. A large part of this expenditure is related to operating environmental protection equipment. There are also other internal activities that intermediate consumption relates to, such as general administration, education, information, environmental management and certification and research and development.

For EPEA and JQ purposes the expenditure for intermediate consumption, in addition to all the other costs of production of EP services, should be divided into environmental domains.

Intermediate consumption regroups:

- Purchases of environmental protection services produced by other units; this expenditure can be carried out both by EP users and EP producers; often EP services purchased by Specialised Producers belonging to GG correspond to outsourcing. In general, the intermediate consumption of EP services of Specialised Producers (whether it is related to outsourcing or not) should be identified and nettled out from the national expenditure in order to avoid double counting;

- Purchases of adapted and connected products; this expenditure can be carried out both by EP users and EP producers;

- Purchases of other goods and services needed to produce EP services; this expenditure is carried out by EP producers only.

In the EPEA, all these components are included in the intermediate consumption of EP producers, while in the JQ purchases of EP services are included in another variable (i.e. fees/purchases, see below).

*Example 4.2: The identification of intermediate consumption for secondary producers in **Belgium***

For secondary producers, it is not easy to identify the part of intermediate consumption linked to their environmental protection activities. The same is true for the other output components. A reasonable assumption to make in the absence of more precise information is that the shares of the different components are the same for environmental and non-environmental output[31]. Then one can estimate intermediate consumption for environmental activities by applying the share of intermediate consumption in total output to environmental output. This implies that environmental output needs to be known or estimated directly, instead of calculated as the sum of its different components.

Source: Internal note, G. Vandille, Federal Planning Bureau, Belgium

EP services' intermediate consumption of Specialised Producers and outsourcing

In the EPEA, purchases of EP services from Specialised Producers are separately recorded in Table B and deducted from the national expenditure aggregate in Table A in order to avoid double counting (as a matter of fact the value of these purchases is already included in the purchases of EP services of the users). This accounting treatment applies for example in the case of outsourcing that is increasing in some particular domains of environmental protection. In some countries, municipalities or groupings of municipalities are responsible for wastewater and/or waste management. In this case, they may subcontract totally or partially the services to private or public firms. They receive fees or payments from users and pay sub-contractors, which may lead to substantial double counting if both the payments of users to municipalities and of municipalities to their sub-contractors are recorded.

In the JQ, intermediate consumption (called internal current expenditure) does not include purchases of environmental protection services bought from the General Government or Specialised Producers such as waste collection, sewage treatment, environmental consultancy services, or surveillance fees. All such purchases are reported under "fees/purchases" variable and are regarded as transactions that finance EXP I in other sectors.

Thus in the JQ intermediate consumption includes only purchases of goods and services needed to produce EP services and/or purchases of connected and adapted non-capital goods such as extra cost for low sulphur fuels.

In the JQ, unlike in the EPEA, intermediate consumption is not separately recorded, but is a part of a larger aggregate i.e. internal current expenditure, which includes intermediate consumption together with compensation of employees for environmental protection. In the EPEA, on the contrary, all the production costs are included and recorded in Table B (Table 4.7).

The difference between the JQ internal current expenditures and the total cost of production accounted for in the EPEA corresponds mainly to the Gross Operating Surplus of

[31] This means that the industry technology assumption is applied. The industry uses the same mix of inputs for all the different kind of goods and services it produces. An alternative method is to use the product technology assumption. Assuming environmental output of all industries consists of products belonging to NACE 90, one could apply the shares of the different output components of NACE 90 to the environmental output of all secondary producers in order to obtain an estimate of the different output components linked to the environmental output of these producers.

producers of EP, i.e. net operating surplus plus consumption of fixed capital (see below for an explanation of these variables).

It is worth noting that the concept of total current expenditure for environmental protection (used e.g. in industry surveys and in the SBS regulation) corresponds to the sum of internal current expenditure and fees/purchases in the JQ. As already mentioned for JQ purposes only intermediate consumption and compensation of employees are included within internal current expenditure and accounted for in EXP I, while fees/purchases are accounted for in EXP II. If the collected statistics cannot separate internal current expenditures from fees/purchases, it is recommended to provide an estimate of the share of fees/payments for EP services in total current expenditure.

The Research and Development expenditures (R&D expenditures)

In the present SNA (SNA 93), R&D expenditures are, by convention, treated as intermediate consumption of the economy, whether relating to market or non-market activities. However, as R&D contribute to future growth in output and as the knowledge gained from R&D is reflected in technological innovations, new products and improved methods, and to keep with economic reality, R&D needs to be recognised as an asset in the SNA and thus to be recorded as Gross Fixed Capital Formation. It is currently in discussion at the OECD and Eurostat level.

4.3.2 Compensation of employees

Compensation of employees is the total remuneration, in cash or in kind, payable by an enterprise to an employee in return for work done by the latter during the accounting period.

It has two main components:

- Wages and salaries, payable in cash or in kind;
- The value of the social contributions payable by the employers.

As intermediate consumption, compensation of employees is one of the main components of the cost of production. In the EPEA, this kind of expenditure is separately recorded in Table B like all other costs of production, while in the JQ it is included in internal current expenditure together with intermediate consumption (EXP I).

Like all other costs of production, compensation of employees should be broken down by environmental domain, but to do so is sometimes complicated. For example, an enterprise could have one employee working with environmental protection who is responsible for several domains. To make this distinction and calculate the right amount of compensation of employees, the proportion ratio between assets is an acceptable rule.

4.3.3 Other taxes on production

According to ESA 95, other taxes on production consist of all taxes that enterprises incur as a result of engaging in production, independently of the quantity or value of the goods and services produced or sold. They may be payable on the land, fixed assets or labour employed in the production process or on certain activities or transactions (ESA 95 §§ 4.22 – 4.24).

Note: EPEA, consistently with national accounts, records in Table B all the production costs incurred by EP producers, including other taxes on production. It is worth underlining that in general these are not environmental taxes, i.e. taxes earmarked to finance EP activities or taxes levied on environmental tax bases[32], but taxes that EP producers have to pay for their production activities; environmental taxes can be included to the extent to which such taxes are among the other taxes on production paid by EP producers.

This component of the costs of production is not included in the JQ that, as already mentioned, limits the content of the internal current expenditure only to intermediate consumption and compensation of employees.

4.3.4 Other subsidies on production

According to ESA 95 "other subsidies on production" consist of subsidies except subsidies on *products* which resident producer units may receive as a consequence of engaging in production (ESA 95 §§ 4.36-4.40).

Consistently with national accounts, EPEA records these subsidies in Table B as a transaction related to the production of EP services. In particular the amount of these subsidies received by the EP producers is deducted from the costs of production in order to obtain the value of the output at basic prices.

In the JQ different types of subsidies are entered. Subsidies for environmental protection are entered under EXP II, within the variable 'Subsidies/transfers': subsidies received by Specialised Producers are accounted for in Table 4, while those paid by General Government are recorded in Table 1 (see Table 4.7 and § 4.4 below for more details).

4.3.5 Consumption of fixed capital

The allowance for the Consumption of Fixed Capital (CFC) is a National Accounts concept (ESA 95 §§ 6.02 – 6.05) which is not shown in the annual reports and published accounts of Government Departments or Agencies. It represents the amount of fixed assets used up, during a period under consideration, as a result of normal wear and tear and foreseeable obsolescence, including a provision for losses for fixed assets as a result of accidental damage that can be insured against.

It should be distinguished from the depreciation allowed for tax purposes or the depreciation shown in business accounts.

Consumption of fixed capital must be calculated for all fixed assets, including both tangible fixed assets and intangible fixed assets such as mineral exploration costs and software, major improvements to non-produced assets and cost of ownership transfers associated with non-produced assets.

It can in theory be based upon estimates of the stock of fixed capital and assumptions about the use of capital, namely the stock of fixed assets and the probable average economic life of the different categories of those goods.

[32] According to the Eurostat Environmental Taxes Statistical Guide, an environmental tax is a tax whose tax base is a physical unit (or a proxy of it) of something that has a proven specific negative impact on the environment.

Note: For the calculation of the stock of fixed assets, the perpetual inventory method (PIM) is recommended whenever direct information on the stock of fixed assets is missing. This method is based on usage of data on creation of gross fixed capital during longer periods combined with data on lifetime period and depreciation patterns of individual categories of fixed assets. Application of this method gives current data on the state of long-lasting tangible and intangible property in reproduction prices and on consumption of fixed capital for the relevant period. The stock of fixed assets should be valued at the purchasers' prices for the current period.

ESA 95 recommends using linear depreciation to estimate the capital consumption, a method by which the value of a fixed asset is written off at a constant rate over the whole lifetime of the goods, unless we have such knowledge of a fixed assets pattern of efficiency-decline that would require using geometric depreciation.

In the absence of such data, the estimate of CFC could be assumed to be equivalent to a proportion of the operating costs of the services. The ratio of CFC to current expenditure differs considerably between countries, probably reflecting differences in, for example, preferred technologies used, industrial structure or main energy source used.

EPEA records this item in Table B among the costs of production of EP services, while JQ, due to its general feature of relying on observation data and actual outlays, does not account for this cost in addition to, in general, all the "imputed transactions" in the national accounts.

*Example 4.3: The calculation of CFC in **United Kingdom***

The Office for National Statistics uses a proportion of the operating costs of the services to estimate the Consumption of Fixed Capital of the government sector. A separate calculation is made for rural sewerage services, waste management by local authorities and other environmental protection activities.

For sewerage services, which are relatively capital intensive, CFC is assumed to be 30 percent of operating costs (compensation of employees and other current costs). This is in line with the ratios experienced in other EU Member States.

For local authorities waste management services, CFC is assumed to be 15 percent of operating costs.

For the remaining environmental protection activities, CFC is taken to be equivalent to only 5 percent of operating costs, in line with the National Accounts estimates for the analysis of General Government total outlays on environmental protection.

Source: Office for National Statistics, UK, 2001

*Example 4.4: The calculation of CFC in **The Netherlands***

In the Netherlands, the "perpetual inventory method" is applied for the calculation of the stock of fixed assets and the consumption of fixed capital. The gross stock of fixed capital is calculated using information on gross fixed capital formation in subsequent years and the expected service life of assets. Consumption of fixed capital is subsequently compiled assuming a straight-line depreciation of the fixed assets and an even distribution of the acquisitions of fixed assets over a year.

Capital goods for collective use with an indeterminate life-time (roads, bridges, etc.), livestock and most intangible assets like software and artistic originals are not taken into account.

As it may be expected that the retirement of capital goods will not take place at once, a survival function must be specified. Concerning the depreciation pattern, for reasons of simplicity, the straight-line depreciation method is applied for all assets.

Furthermore, information on the expected service life of an asset is directly observed data for different types of assets for a number of industries provided by statistics on capital stock and a questionnaire on disinvestment. Whenever information is absent, data for comparable industries and/or types of assets are used; in addition, some expert guesses are made. In The Netherlands, the average expected service life is assumed to be constant over time.

However, enterprises are allowed to depreciate on the environmental investment at a pace that they choose themselves. It is the so-called "Vamil" arrangement.

Source: Statistics Netherlands, 1997

4.3.6 Net operating surplus

The net operating surplus (NOS) is a balancing item calculated as the difference between output (sales) and intermediate consumption, compensation of employees, net taxes on production (i.e. other taxes on production less other subsidies on production) and consumption of fixed capital. A negative net operating surplus indicates that part of the production costs is not covered by sales.

Implicit subsidies

Market producers belonging to General Government can have a substantial negative net operating surplus. It is recommended in Eurostat 2002 that a negative net operating surplus should be offset by "other subsidies on products"[33]. These subsidies are called "implicit subsidies" because they are not explicitly shown in the accounts of government. Consistently with national accounts, EPEA accounts for net operating surplus in Table B among the costs of production. In case NOS is negative, the implicit subsidies that offset a negative net operating surplus are not recorded in Tables B and B1 but only in Tables A and C[34], where they are accounted for as specific transfers and broken down by beneficiary. Nonetheless implicit subsidies can be shown also in Table B by creating an ad hoc entry.

As already mentioned, JQ does not record "imputed transactions", including NOS in national accounts.

4.3.7 Output

EPEA records the value of the whole output of EP producers (i.e. both the EP and the non-EP output) in Table B, while JQ does not include this variable as such (Table 4.7).

In the EPEA the non-environmental output has to be separately identified and deducted from the total output in order to quantify the environmental protection part; the latter is further broken down into non-market output (sold at prices not economically significant, called partial payments, i.e. prices which, according to ESA 95 criteria, cover less than 50% of the production costs), market output (sold at prices economically significant, i.e. which cover more than 50% of the production costs) and ancillary output (i.e. production for own use).

The production of EP services is valued in accordance with national accounts conventions for the valuation of output. In national accounts, marketed output is valued at basic price, whereas uses are recorded at purchaser's price. The relationship between basic prices and purchasers' price is the following: basic price is the price paid by the purchaser less any taxes on products (whether deductible or not) plus any subsidies on products received by the producer. Non-marketed output is EP services that are provided free, or at prices that are not economically significant, to other units. This type of output is valued by the total cost of production.

There are several ways of calculating the output. Sometimes national accounts data and/or surveys data (production surveys, ad hoc surveys) can be detailed enough to give the output of some categories of EP producers, especially Specialised Producers, to be directly entered in the corresponding row of Table B. For some categories of EP producers, or when the data sources above are not detailed enough, the output should be calculated

[33] Eurostat, (2002), "SERIEE Environmental Protection Expenditure Account – Compilation Guide"
[34] See Eurostat, (2002), "SERIEE Environmental Protection Expenditure Account – Compilation Guide", page 82).

as the sum of the costs of production. Sometimes other methods can be applied based on physical data, e.g. the 'price times quantity' method (for details see Eurostat, 2002, *SERIEE Environmental Protection Expenditure Account – Compilation Guide*, ch. 5).

Example 4.5: The record of output in ***Belgium***

For NACE 90[35] total output needs to be recorded, as the industry belongs to the Specialised Producers. The value can easily be found in the National Accounts. In order to discriminate non-environmental output from environmental output, use is made of a company register.

In this register, "other business income" is separated from "main activity turnover". The shares of these two kinds of income are calculated for all NACE 90 companies in the register, after which total output from the National Accounts is split into environmental and non-environmental output according to the share of "main activity turnover" and "other business income" respectively.

For secondary producers, only environmental output needs to be recorded. Environmental output can be identified in the supply table, which shows which kind of products are made by the different industries. If supply tables are not produced for each year, the share of environmental output in one particular year can be applied to total output of the secondary producer industry in other years in order to provide an estimate of environmental output in those years for which no supply table is available.

Source: Internal note, G.Vandille, Federal Planning Bureau - Belgium

JQ does not record the output of the EP producers and does not account for all the costs of production within the internal current expenditures. Nonetheless, within EXP II, EP market output is captured through the 'Revenues from sales of EP services' variable, while the non-environmental output is approximately captured through the 'Receipts from by-products' (see below for explanation on these variables).

As market output is, in Table B of EPEA, a current EP resource, this concept is detailed in the sub-chapter 4.3.8 Current EP resources below.

4.3.8 Current EP resources

The current environmental protection resources are the receipts of the EP producers. These receipts correspond to the market EP output (i.e. EP output which is sold, whatever the name given to the price) and current transfers (i.e. payments without counterpart by government units to other units: subsidies and other current transfers) for the production of EP services.

Identifying current EP resources means identifying that part of total EP output that is financed by payments from other units, and by difference that part which has to be paid for by the producer itself. Basically this latter part refers to:

- The value of total non-market output less partial payments and current transfers to producers of the government sector,

- The value of ancillary output of other producers, less the subsidies received from government units.

[35] Division 90 of NACE Rev. 1.1 will be classified in divisions 37, 38, 39 or 81 of NACE Rev.2.

In the EPEA, current EP resources are recorded in Table B; the items listed above are entered in Table C as financing by the producers themselves.

In the JQ, current EP resources correspond respectively to revenues for the sales of EP services and subsidies/transfers received by Specialised Producers and paid by General Government (GG). In order to calculate the EXP II aggregate, the revenues of EP services are deducted from EXP I both for GG and Specialised Producers, while subsidies/transfers are deducted for Specialised Producers and added for GG.

Market output

The market EP output corresponds to the EP output which is sold by the producer to other units, whatever the name given to the price (market price, fees, charges, partial payments, etc.).

In the EPEA, market EP output is accounted for in Table B at basic prices and it is evaluated at purchasers' prices in Table B1 by adding taxes on products (mainly VAT) and deducting subsidies on products (often negligible).

In the JQ, market EP output is recorded as a resource through the variable 'Revenues', i.e. the payments that General Government and Specialised Producers receive for selling environmental protection services (the Fees/Purchases). These payments are entered as revenues in the respective sector. These revenues should be deducted from abater expenditure (EXP I) in order to evaluate their financing expenditure (EXP II).

Current transfers

Current transfers are payments without counterpart by government units to other units for the production of EP services (or adapted or connected products). They consist of subsidies and other current transfers.

These transfers do not exist for Specialised Producers belonging to the corporation sector (S11) and are often small for those belonging to General Government.

Thus, in the EPEA, these transfers are entered in Table B only if they are received by Specialised Producers belonging to General Government. A corresponding amount is entered in Table C if such transfers are incurred by different levels of GG, e.g. from Central Government to Specialised Producers of Local Government: a corresponding financing flow can be shown in Table C only if the GG level which pays the transfers differs from the one which receives them.

In the JQ, such transfers are entered in Table 1 as Subsidies/transfers paid by General Government and in Table 4 as Subsidies/transfers received by Specialised Producers.

Receipts from by-products

Sometimes, environmental protection activities produce by-products that have an economic value. These could either be sold and generate revenues, or be used internally and lead to reductions in costs. Some examples are the use of biogas from landfills, income from incineration plants or sludge sales from wastewater treatment. But it could also be consultants from waste treatment plants who share knowledge and expertise in other countries.

Energy or material savings due to more efficient processes and other productivity gains resulting from environmental protection activities are not to be included as receipts from by-products. But energy generated and material recovered, as a result of waste treatment, are considered as receipts from by-products. So there should always be a specific EP activity that these receipts stem from.

In the JQ, receipts from by-products are separately recorded, while in the EPEA they are not but must be deducted from the costs of production in order to obtain the value of the EP output. Then, in the EPEA, these receipts correspond approximately to the non-EP output recorded in Table B.

Although the receipts from by-products of the JQ and the non-environmental output of the EPEA largely correspond, the two variables are not identical. In EPEA, non environmental output is rather strictly defined as the part of the output of Specialised Producers that does not correspond to environmental protection services, e.g. recyclable materials for the NACE 37 producers[36]. In the JQ the definition of the variable is broader, as it also includes "savings of raw material or energy generated as a result of waste treatment". However it is not clear whether this information is available in different countries. One should also notice that receipts from by-products are an output-type measurement. Deducting these from "internal expenditure" may lead to a bias (Eurostat, 2005).

For Specialised Producers, this variable should be interpreted as revenues from by-products plus revenues from non-environmental activities. The General Government should have very little or zero income from non-environmental output.

4.3.9 Capital transactions

Gross fixed capital formation (GFCF) and other capital uses (land)

To execute characteristic activities, characteristic producers invest in gross capital formation and acquisitions less disposals of non-produced non-financial assets (land, patents, etc.).

In the case of Specialised Producers, whichever institutional sectors they belong to, the total gross capital formation is assumed to be for environmental protection (see SERIEE 1994 Version, § 2181); then for the Specialised Producers the total expenditure for gross capital formation is fully recorded in Table B of the EPEA and in Table 4 of the JQ.

In the EPEA, the gross capital formation is not recorded for secondary producers while it is recorded for the ancillary producers (see *SERIEE 1994 Version*, §§ 2149-2152).

In the JQ, the gross capital formation is recorded for the ancillary producers as well as for the public sector (Table 1). For these sectors, as for ancillary producers in the EPEA, the total investments are the sum of the following two categories:

- End-of-pipe investments: These investments do not affect the production process itself but they serve to treat pollution already generated.

- Investments in integrated technologies: These investments lead to a modified or adapted production process. They serve to reduce the amount of pollution generated. It may be a modification of the existing process or a totally new production process.

The criterion applied for deciding whether investments are for environmental protection or not has to be specified. Following SERIEE and Structural Business Statistics (SBS)

[36] Division 37 of NACE Rev.1.1 will be classified in division 38 of NACE Rev.2.

Regulation, the "purpose criterion" described in chapter 4.1.1 is used. According to this criterion, an investment is included when made for environmental protection purposes.

As capital formation is one of the main components of the national EP expenditure aggregate provided by the EPEA, it is also treated in detail in chapter 4.4 which is dedicated to Table A of the EPEA.

Note: The environmental purpose criterion should be applied by means of comparison with the normal operating activity of the sector or unit, whereby activities beneficial to the environment that would have been taken regardless of environmental protection considerations are not considered as environmental protection activities.

There are a large number of activities that may have a favourable effect on the environment but whose main purpose is not environmental protection. The expenditure associated with these activities should not be reported as environmental protection expenditure.[37]

Example 4.6: The identification of environmental investments in ***Belgium***

It is assumed that all investments by NACE 74 and NACE 41[38] are made to serve both the production of environmental and non-environmental output. As a consequence, no specific investment for environmental output is registered.

The description of the variables used in Belgium for the compilation of the EPEA is shown in Annex 6.

Source: G. Vandille, Federal Planning Bureau, 2005

Investment grants

Investment grants consist of capital transfers in cash or in kind made by government or by the rest of the world to other resident or non-resident institutional units to finance all or part of the costs of their acquiring fixed assets. Investment grants in kind consist of transfers of transport equipment, machinery and other equipment by government to other resident or non-resident units and also the direct provision of buildings or other structures for resident or non-resident units.

In the EPEA, investment grants are accounted for in Table B according to EP producers that receive them. They are also entered in Table C as financing from GG to EP producers. Specialised Producers contribute to national EP expenditure (Table A) only through their GFCF for EP activities; then in Table C the part of national EP expenditure of Specialised Producers that is not financed by themselves is represented by the investment grants they receive from GG together with other capital transfers (see below).

In the JQ, such transfers are entered in Table 1 as Subsidies/transfers paid by General Government and in Table 4 as Subsidies/transfers received by Specialised Producers (EXP II).

[37] Eurostat, (2005), "Environmental Expenditure Statistics: Industry Data Collection Handbook"
[38] Division 74 of NACE Rev.1.1 will be classified in division 24, 59, 63, 69, 70, 71, 73, 74, 77, 78, 80 or 82 of NACE Rev. 2 and division 41 in division 36.

*Example 4.7: The investment grants in **Belgium***

Investment grants are mainly provided by regional government.

The beneficiaries are firstly corporations and secondly local administrations.

The local administrations receive, for example, grants for the improvement and the purification of water bodies. The grants can be used for instance to finance the construction of municipal sewerage. In such cases they are recorded as EPE.

Another example are the grants given to the private sector for the protection of nature in the context of the LIFE project, co-financed by the EU.

A third example are grants provided to local administrations in order to buy land in the context of the Natura 2000 programme.

Source: Internal note, G. Vandille, Federal Planning Bureau - Belgium

Other capital transfers

Capital transfers are different from current transfers by the fact that they involve the acquisition or disposal of an asset, or assets, by at least one of the parties to the transaction. A capital transfer in kind consists of the transfer of ownership of an asset (other than inventories or cash), or the cancellation of a liability by a creditor, without any counterpart being received in return.

A capital transfer in cash consists of the transfer of cash that the first party has raised by disposing of an asset, or assets (other than inventories), or that the second party is expected, or required, to use for the acquisition of an asset or assets other than inventories.

While transfers for interest relief, i.e. that are designed to cover part of the interest charges, are treated as current transfers, transfers that are designed to cover (part of) the amortisation of debt are treated as capital transfers. In the EPEA, subsidised loans (soft loans) given for the acquisition of fixed assets are treated as capital transfers. Soft loans are valued by their cash grant equivalent, i.e. the cash equivalent of the preferential interest rate (SERIEE 1994 version, § 2042).

Accounting in the case of other capital transfers in the EPEA and in the JQ is the same as that of investment grants (see above).

4.3.10 Labour inputs

EPEA in Table B also records a physical parameter that is not considered in JQ, i.e. the labour inputs.

This figure can be quantified by means of different data sources.

It is recommended that this item be quantified in such a way that it is consistent and comparable with the 'Compensation of employees' figure entered in the same Table B. For example, if the Compensation of employees is calculated through national accounts data the most consistent labour inputs variable is generally represented by full time equivalent employment.

4.3.11 Stock of fixed assets

In the EPEA, in order to calculate the consumption of fixed capital (Table B) and the interest on fixed capital (Table C1), capital stock accounts should be set up.

They can be based on long-term series of investment using the perpetual inventory method. If long-term series of investments are not available, an initial estimate of the capital stock in place (and its age structure) can be made on other data.

The *SERIEE Environmental Protection Expenditure Accounts Compilation Guide* provides details and examples on how to estimate the capital stock (Eurostat, 2002 pages 70-74).

It is worth underlining that to set up capital stock accounts can be particularly useful also for linking expenditure data to physical data.

The JQ does not require estimation of the capital stock due to the fact that imputed costs such as consumption of fixed capital and interest on fixed capital are not recorded.

4.4 Components of measuring EP services: the use side

From the use side, EPE consist of all the transactions related to the use of EP services in addition to connected and adapted products (for example CFC-free products or biofuels)[39].

In the EPEA, these transactions lead to the calculation of the aggregate 'national expenditure for environmental protection', which is described in Table A by its components and the categories of units to which the expenditure is allocated. The various components mainly consist of:

- Uses of EP services (except by Specialised Producers);

- Capital formation for environmental protection (including net acquisition of land);

- Uses of connected and adapted products;

- Specific transfers for environmental protection (accounted for in Table A by beneficiary).

The components of national expenditure do not all have the same importance. Uses of EP services are by far the most important item of national expenditure, followed by capital formation. Uses of connected and adapted products tend to be small (with few exceptions, e.g. when septic tanks are widely used in a country). Specific transfers tend to be very small, except when primary data on the other components are incomplete (e.g., when only the transfers are known but no data are available or can be estimated on the expenditure financed by these transfers).

Not all these components concern General Government and Specialised Producers; in Table A of EPEA these sectors are taken into account as follows:

- General Government in its capacity as consumer of collective services (i.e. as collective consumer of non-market output);

- Specialised Producers of EP services for their investment for environmental protection.

[39] See § 4.4.3 for more details.

In the JQ, as mentioned, an aggregate that corresponds to the national EP expenditure is not calculated. The collective consumption of non-market output by General Government is entered in EXP I ('internal current expenditure') in addition to the capital formation for the production of EP services ('investment expenditure') and the uses of connected and adapted products ('internal current expenditure'). Uses of market output of EP services and specific transfers are accounted for in EXP II.

Due to the JQ criteria for the classification of the units – according to which market Specialised Producers of General Government are taken into account into the Specialised Producers' category (Table 4) and not within the "public sector" (Table 1) – investments made by Specialised Producers belonging to General Government are entered under Specialised Producers (Table 4), together with those of specialised corporations (S11), and not under "public sector" (Table 1); accordingly, "public sector" expenditure (Table 1) is limited to the EPE related to the non-market output, i.e. the expenditure carried out by General Government as consumer of non-market EP services and investments for the production of non-market EP services.

Table 4.8 lists the EPE variables related to the uses of EP services and connected and adapted products. As in the previous Table 4.7, variables are listed starting from the EPEA (left column), then showing the ESA 95 variables they belong to (middle column) and finally highlighting the corresponding JQ variables.

Table 4.8: Detailed comparison of EPEA and JQ variables: transactions of Specialised Producers and General Government for the use of EP services and goods

EPEA Table A: Components of national expenditure (summary presentation)	ESA 95 Variables		JQ aggregates and variables (Tables 1 and 4)	
	Code	Description	Aggr.	Variable
1 Uses of EP services			EXP II	Fees/purchases of EP services
final consumption	P3	Final consumption	EXP II	Fees/purchases of EP services
intermediate consumption	P2	Intermediate consumption	EXP II	Fees/purchases of EP services
capital formation (land improvement)	P51	Gross fixed capital formation	EXP II	Fees/purchases of EP services
2 Capital formation for EP (and net acquisition of land) (1)	P51	Gross fixed capital formation	EXP I	Investment expenditure (made by GG as Non-Specialised Producers or as non-market Specialised Producers – Table 1; made by GG market Specialised Producers and corporation Specialised Producers – Table 4) (2)
3 Uses of adapted and connected products			EXP I	(various variables)
final	P3	Final consumption	EXPI	(households – Table 3)
intermediate	P2	Intermediate consumption	EXP I	Internal current expenditure
capital formation	P51	Gross fixed capital formation	EXP I	Investment expenditure
4 Specific transfers			EXP II	Subsidies/transfers (paid/received)
current	D3 D7	Subsidies Other current transfers	EXP II	Subsidies/transfers (paid by GG to units other than Specialised Producers belonging to corporation sector – Table 1; received by market Specialised Producers of General Government – Table 4) (3)
capital	D92 D99	Investment grants Other capital transfers	EXP II	Subsidies/transfers (paid by GG to other units – Table 1; received by Specialised Producers – Table 4) (1)

5 Total domestic use (1+2+3+4)				(no correspondence to JQ aggregates.) [4]
6 of which financed by the rest of the world				(transactions indirectly included but not separately recorded) [5]
7 National expenditure for environmental protection (5-6)				(no correspondence to JQ aggregates.) [4]

[1] In the EPEA the contribution of Specialised Producers to National EP expenditures is restricted only to their investments.
[2] In the JQ, investments made by market Specialised Producers belonging to General Government are entered under Specialised Producers (Table 4), in addition to those of specialised corporations (S11), and not under General Government (Table 1); accordingly, General Government expenditure is limited to the non-market output.
[3] These current transfers do not exist for Specialised Producers belonging to the corporation sector (S11) and are often small for those belonging to General Government.
[4] For the transition from the JQ aggregates EXP I and EXP II to the EPEA National Expenditures see Eurostat, (2005), OECD/Eurostat Environmental protection expenditure and revenue Joint Questionnaire/SERIEE environmental protection expenditure accounts Conversion guidelines – Table 10 p. 22.
[5] For example, in general in JQ, part of the subsidies paid or received by "public sector" could relate to environmental aid/funding. Part of the revenues received (and associated expenditure) by Specialised Producers could relate to exports. Part of the investments could relate to purchase of capital goods from abroad etc.

4.4.1 Uses of environmental protection services and price concept

Uses of EP services represent the most important EPE from the use side and also form the main component of national expenditure in the EPEA.

In the EPEA, uses of EP services are accounted for in Table A at purchasers' prices while the output of EP services is recorded in Table B at basic prices or cost of production. The transition from the output of Table B to the uses of Table A is made through Table B1, by accounting for two main groups of transactions (see Eurostat, 2002, ch. 5):

- The first group is related to imports and exports of EP services. As national expenditure describes the uses of economic resources by the domestic economy, imports of EP services are to be added to the domestic supply, whereas exports have to be subtracted in order to arrive at domestic uses. Imports and exports of EP services are often very small so that after verification of this assumption this type of adjustment may be ignored.

- The second group of transactions relates to the system of prices. As in the national accounts, the EPEA records the uses of EP services at purchasers' prices, whereas the supply of these services is initially valued at basic prices or cost of production. Therefore, a revaluation is made of the supply to make it consistent with the prices in which uses are measured, by adding non-deductible VAT and other taxes on products and deducting subsidies on products. Except for non-deductible VAT (paid mostly by households) these revaluation items are typically unimportant and may be ignored.

Note: The JQ is not very specific about the price concepts to be used for the various transactions on goods and services it covers. In particular the only specification made is that fees and purchases of environmental protection services should be recorded including non-deductible Value Added Taxes (VAT). However, in order to be consistent with the EPEA, payments ought to be recorded at the purchaser's price.

The general recommendation is thus to record expenses at the purchaser's price both for EPEA and JQ. By doing this, recorders are consistent with the National Accounts and in particular with data on General Government expenditure by COFOG.

EP services can be used as:

- Final consumption;
- Intermediate consumption;
- Capital formation.

Focusing on General Government and Specialised Producers, final consumption accounted for in Table A of EPEA is the collective consumption of non-market EP output provided by the General Government itself and then calculated at the costs of production.

Intermediate consumption of EP services is not entered for Specialised Producers in Table A, in order to avoid double counting, because it is already included in the use of EP services provided by Specialised Producers themselves. This intermediate consumption of EP services often corresponds to EP services subcontracted by General Government to Specialised Producers.

The only example found so far of the use of EP services that represents a capital formation is the land improvement as a result of decontamination of soil (CEPA 4). In the EPEA, the purchase of this EP service is considered as gross fixed capital formation from the point of view of the user (either by General Government units or non-specialised); from the point of view of the producer of this service, the related costs of production and investment are entered in Table B.

The particular case of decontamination of soil is not explicitly dealt with in the explanatory notes of JQ. Nonetheless, from the point of view of the user of this service, the corresponding expenditure should not be entered within the investments which are defined as related to the production of EP services but to their purchase; on the user side (e.g. in Table 2 of JQ if the user is an enterprise) this service has to be accounted for among fees/purchases of EP services. Correspondingly, internal current expenditure for labour and equipment and investments for the production of the service, if any, have to be recorded on the producer side (e.g. in Table 4 if the producer is a specialised producer).

4.4.2 Capital formation for environmental protection activities

Capital formation for environmental protection activities is one of the most relevant EPE. This variable corresponds to Gross Fixed Capital Formation (GFCF) and land acquisition and is defined identically both in JQ and EPEA. These kinds of transactions refer to investments of market or non-market producers of EP services.

In the EPEA, the capital formation for the production of EP services is one of the main components of the national expenditure and then is accounted for in Table A. The value of capital formation entered in Table A is exactly the same as that accounted for in Table B for the different kinds of EP producers, i.e. specialised, secondary and ancillary producers. For Specialised Producers, belonging both to General Government and Corporations, capital formation is the only contribution to the national expenditure accounted for in Table A.

In the JQ, capital formation for EP activities or investments for EP are recorded according to the abater principle under EXP I. As already mentioned, the investments of all Specialised Producers are entered in Table 4, both for market and non-market sectors, while in Table 1 only the investments made by General Government for the production of non-market EP services should be entered.

4.4.3 Uses of adapted and connected products

According to SERIEE, connected and adapted products cover products whose use serves an environmental protection purpose, although they are not classified as EP services[40].

Connected products are products whose use by resident units directly and exclusively serves an environmental protection objective but which are not EP services produced by an environmental protection activity.

Adapted products are defined as products that are:

- Less polluting when consumed and/or disposed of than equivalent normal products. Equivalent normal products are products that provide similar utility, except for the impact on the environment;

- More costly than equivalent products. Only the extra costs paid in order to make an adapted product available to the user are considered as environmental protection expenditure in EPEA.

While many examples of connected and adapted products exist (such as mercury-free batteries, solvent-free paints, biodegradable packaging materials, CFC-free products, septic tanks, catalytic converters, trash bags, etc.), only very few products are of practical relevance. A classification of connected and adapted products has not been developed, while a number of recommendations are provided by the *SERIEE Environmental Protection Expenditure Accounts Compilation Guide* (Eurostat 2002, page 87)[41].

Expenditure for connected and adapted products in general does not represent a great part of EPE. The data provided by European countries that have covered this kind of expenditure in their EPEA accounts indicate that purchases of connected and adapted products can be expected to be between 5% and 10% of total expenditure (but they are more important for some domains – e.g. for air protection).

General Government and Specialised Producers can use these products as intermediate consumption.

General Government can purchase connected and adapted products for the production of EP services (i.e. as an EP producer) or for carrying out non-EP activities. In the EPEA, when General Government is an EP producer the intermediate consumption of connected and adapted products is entered in Table B, but not in Table A in order to avoid double counting; when General Government is not an EP producer the intermediate consumption

[40] Eurostat, 2002, p 86

[41] As a minimum, it is recommended to make estimates of the use of the following products in a systematic way: 1) septic tanks; 2) maintenance services and other products for septic tanks; 3) catalytic converters for vehicles; 4) desulphurised fuels. This minimum list includes only one adapted product (i.e. desulphurised fuels), all other being connected products.
Septic tanks and associated goods and services may be less relevant in Member States where a high share of the population is already connected to sewerage networks. Catalytic converters should be recorded by assessing the total number of converters sold in 1 year (including those built in new cars).
It is recommended that the following products be included as well: 1) a more complete set of measures relating to vehicles, based on the cost of compliance with environmental regulations (in addition to the catalytic converters already covered); this includes measurement services of exhaust gases of vehicles and measures to adapt trucks, buses and aeroplanes; 2) trash bags, bins, rubbish containers, compost containers.
When estimating the expenditure associated with the use of bins, wheeled rubbish containers, etc. account should be taken of those bins, etc. which are owned by specialised public or private units engaged in collecting waste as these are already included in their expenditure figures. The same applies to producer units that are subject to a specific industry expenditure survey.
The following connected products may be considered as well: 1) measurement services of exhaust gases of heating systems; 2) exhaust pipes of vehicles; 3) anti-noise windows.

of connected and adapted products is accounted for in Table A only. In the JQ, the intermediate consumption of these products is included within 'Internal current expenditure' in Table 1 if General Government is not a specialised producer or is a non-market specialised producer.

Intermediate consumption of connected and adapted products by Specialised Producers in the EPEA is accounted for only in Table B, while in the JQ is accounted for in Table 4, under 'Internal current expenditure'.

4.5 Specific transfers

Specific transfers are unrequited payments received by resident or non-resident units which contribute to the financing of EP activities and uses of EP products or constitute a compensation for income or capital losses relating to environmental protection. A distinction is made between current and capital transfers. Within current transfers, a distinction is made between subsidies on production and other current transfers.

This definition includes many kinds of transfers such as e.g. (see *SERIEE 1994 Version* §§ 2039-2047 for more details):

- Subsidies on products paid by General Government or European Union institutions to market characteristic producers or market producers of adapted or connected products in order to lower the prices of characteristic services or adapted or connected products,

- Subsidies to compensate (part of) the cost of ancillary environmental protection activities (other subsidies on production),

- Current transfers made to households in their capacity as consumers to compensate (part of) the burden of acquisition of specific products (e.g. fiscal incentives to purchasers of catalytic converters),

- Current transfers to NPISHs including voluntary contributions, membership subscriptions, etc. which NPISHs receive from households and other units,

- Capital transfers from General Government to other units or between General Government units in order to compensate or cover severe capital losses or accumulated deficits linked with environmental protection,

- Current or capital transfers to the rest of the world in order to finance environmental protection programmes (international public or private co-operation, etc.),

- Capital transfers from General Government to other units or between General Government units in order to finance gross capital formation (investment grants),

- Taxes constitute specific transfers when their revenues are earmarked for environmental protection. Such taxes are called specific taxes.

Subsidies are paid to market (and own-account) producers only. Within subsidies on production, subsidies on products and other subsidies on production are distinguished. Subsidies on products are payable per unit of a product. Other subsidies on production are not directly linked to the quantity or value of the products. Subsidies intended to cover all or part of the cost of reducing pollution are deemed to be other subsidies on production

(ESA 95 § 4.37). Other current transfers are current transfers within General Government, current international co-operation, current transfers to NPISHs, etc.

Capital transfers are transfers linked to the acquisition (or disposal) of fixed assets. They are subdivided into investment grants and other capital transfers. Investment grants are intended to finance the cost of acquisition of fixed assets of resident or non-resident units. Other capital transfers are transfers to cover capital losses or accumulated deficits, large legacies or donations, etc. (see § 4.3.9 above).

Environmental taxes constitute specific transfers when their revenues are earmarked for environmental protection. Such taxes are thus called specific taxes (see below § 4.6.2 for explanation of this variable).

Transfers are recorded twice: as a resource for the unit that benefits from it and as a charge for the unit which pays for the transfer. Normally, positive and negative transfers should balance each other out between sectors. However, there are at least two cases where transfers paid and received may not balance each other out.

- The first case concerns transfers to or from the rest of the world;

- The second case is when transfers are paid but the beneficiary of these transfers cannot be identified. These are the open-ended transfers. Open-ended transfers are dealt with in sub-chapter 4.5.1 below.

4.5.1 Specific transfers in the EPEA

In the EPEA, all kinds of specific transfers are taken into account. They are recorded in different accounting tables depending on whether they constitute a resource of EP producers (Table B), a component of the national EP expenditure (i.e. environmental transfers which are not a counterpart of other EP transactions – Table A) or a financing of national EP expenditure (Table C).

Specific transfers relating to EP expenditures are often already recorded in the chief of the receiver or the payer. Therefore, adding the transfer payments in such cases would lead to double counting. When they are the counterpart of expenditure already recorded, specific transfers constitute only one way of financing EPE.

This is the case for a lot of specific transfers paid by General Government to EP producers, e.g. subsidies or investment grants (for current and capital transfers given to EP producers see above § 4.3). These transfers are often aimed at covering partially the costs and/or the investments to produce EP services. They are shown in Table B as a resource of EP producers and are entered also in Table C only if they constitute a financing of a component of the national EP expenditure.

Due to the valuation system adopted in the EPEA, intermediate consumption or final uses of EP services are recorded at purchasers' prices and thus they integrate the effect of subsidies (in addition to that of taxes). In this case subsidies are not entered elsewhere in the EPEA: neither in Table A, where their effect is integrated in the purchases of EP services, nor in Table C because they do not constitute a financing of national expenditure. A different treatment applies to investment grants and other capital transfers: the capital formation for the production of EP services is fully recorded in Table A as a component of national EP expenditure; hence investment grants and other capital transfers represent a financing of this component of national expenditure and then have to be accounted for in Table C.

Subsidies on EP services or connected and adapted products reduce the price paid by purchasers, in relation to the basic prices. Therefore, the expenditure recorded for the use of these products in the national expenditure aggregate is undervalued in relation to the economic resources necessary for their supply. In that case, the subsidies are entered as a specific item in the national expenditure (Table A). Not entering these subsidies would give a wrong picture of the total resources used for environmental protection.

In this case, the purpose of the integration of specific transfers in the national expenditure aggregate is to describe those uses of economic resources for environmental protection which are not covered by the other components of environmental expenditure, i.e. which do not take the form of uses of goods and services (income transfers, transfers to other countries) or are not included in the prices of EP services and connected and adapted products (e.g. subsidies leading to lower prices paid by the purchasers). Experience suggests that the specific transfers that lower the prices of EP goods and services are often very small and may be ignored. This may not apply to the issue of negative operating surplus of government market producers which are offset by an implicit subsidy on products. An implicit subsidy means that the prices these government market producers charge are too low to cover all costs of production, and the consumption is undervalued. Such implicit subsidies can be quite large and should be recorded in Table A under a specific sub-heading of 'specific transfers' (see Eurostat, 2002, § 5.5).

The second purpose of the integration of specific transfers in the national expenditure aggregate in Table A is to take up 'open-ended' transfers. These are transfers that would normally not be recorded in Table A, because they only contribute to financing items already included (e.g. investment grants). However, some of these transfers may be without a counterpart in the basic data available for the EPEA.

Note: The best solution, in the case where open-ended transfers are without a counterpart in the basic data available for the EPEA, is to impute the transfers to the most probable beneficiary. If such an imputation is not possible, the 'open-ended' transfers should be accounted for in Table A within specific transfers.

For example, transfers are identified in the accounts of central government that go to a government agency, NGOs or to transport companies but the expenditure of these beneficiaries is not available because they are not surveyed or their annual reports are not available. In such a case, these transfer payments can be used as a basis to estimate the expenditure of these agencies, NGOs or transport companies and determine the supply and use of EP services and the investment they make. If such estimations appear unreliable, it may be best to enter such 'open-ended' transfers in the specific transfers row in Table A.

Such 'open-ended' transfers may be of particular importance in the biodiversity and landscape protection domain (CEPA 6) where farmers may receive state aid in various forms targeted at protecting the environment. Often, these transfers are the only basis to estimate the value of environmental protection services produced by farmers.

A similar situation can occur for agricultural and grazing practices less harmful for soil and water bodies (to be classified within CEPA 4): also for these activities often only the transfers from General Government to farmers are identifiable from public budgets or other related sources. Instead of estimating the value of these EP services it may be considered to enter the transfers in the specific transfers row of Table A.

4.5.2 Specific transfers in the JQ

In the JQ, all types of transfers financing Environmental Protection activities or expenditure in other sectors are accounted for within the variable 'Subsidies/Transfers', including transfers to or from other countries. These constitute part of financing expenditure for the paying sector, and reduce the financing of EXP I in the receiving sector. When a sector both receives and gives transfers, the net amount should be recorded.

Included are payments of so called "earmarked" environmental taxes (e.g. general pollution taxes), which are not payments for a bought service but where the revenues are earmarked for financing environmental protection measures. Payments of general environmental or green taxes (such as energy taxes) where the revenues are not earmarked for financing environmental protection measures are excluded.

In the JQ, for the Specialised Producers, this variable includes all subsidies and other transfers received which finance environmental protection in the sector minus payments of earmarked environmental taxes. The subsidies received from other units include, among others, the subsidies from the government. These could take the form of direct transfers, capital grants or soft loans.

For General Government, the variable subsidies and transfers include all subsidies and other transfers paid by them which finance environmental protection activities in other sectors or countries minus revenues received on earmarked environmental taxes minus any transfers received from abroad.

4.5.3 The particular case of subsidies

Definition in the national accounts

The ESA 95 defines subsidies as "current unrequited payments which General Government or other institutions make to resident producers, with the objective of influencing their levels of production, their prices or the remuneration of the factors of production". Broadly speaking, a subsidy keeps prices below the market price by giving financial support with the change of the marginal cost of goods or service.

Some forms of payments are excluded, for example:

- Capital transfers, such as investment subsidies;
- Current transfers from the government to households in their role as consumers.

Transfers given to activities in other countries are also excluded.

So in national EP expenditure, only some specific transfers are included, namely those that lower the price paid by the purchasers of EP services or that compensate for income or capital losses related to EP, as otherwise total expenditure would be underestimated.

Environmental subsidy

According to ESA 95, environmental subsidies are recorded under "other subsidies on production". They consist of current subsidies to cover some or all of the costs of additional processing undertaken to reduce or eliminate the discharge of pollutants into the environment. These consist of subsidies except subsidies on products which resident units may receive as a consequence of engaging in production.

The definition in ESA 95 is limited in that it only includes subsidies not counted as an investment grant and only focuses on the reduction or elimination of the discharge of pollutants. However, it is up to the compiler to actually select the appropriate expenditure.

There are arguments in favour of the use of the motivation criterion to identify environmental subsidies, considering the conditions for the selection of environmental expenditure either for EPEA and JQ and the definition used in SERIEE. Whatever kind of transactions they constitute, they must indeed satisfy the primary purpose criterion, i.e. that environmental protection is their prime objective.

Note: The SERIEE manual states clearly that, when compiling the EPEA, a distinction must be made between purpose and effect and that actions and activities undertaken for other than environmental purposes should not be included, even if they have positive environmental effects. It is recommended the same approach be followed when filling in the JQ.

However, by choosing the original motive for the subsidy, the political influence will be very strong in the compiled statistics. For example, if a budget line has been motivated by regional or cultural reasons these should not be classified as environmentally motivated.

The recommendation could nevertheless be that the selection criteria that eliminate inconsistency with EPEA and JQ definitions and reduce risks of bias or subjectivity are:

- To strictly follow the SERIEE definition of specific transfers: "specific transfers are unrequited payments received by non-resident or resident units which contribute to the financing of **characteristic activities** and uses of **specific products** or constitute a **compensation for income or capital losses related to environmental protection**" (SERIEE 1994 manual, § 2039);

- To take into account the motivation of the subsidy as it is expressed at policy level.

Sweden has developed a method to select environmental motivated subsidies. It is presented in the example below.

*Example 4.8: The environmental subsidies in **Sweden***

Environmentally-related total subsidies are determined by deciding which budget lines in the budget proposal have an environmental purpose. This is achieved by a detailed review of budget proposals. If there is an environmental motive written in the budget proposal, the paid subsidies from this budget line are taken as environmentally motivated. In some cases, additional information about the motive behind the budget line must be given.

However, there are cases when the whole budget line cannot be regarded as environmentally motivated. Sweden has used the same method as for the EPE. For EPE, they therefore used a calculated share of all expenditures resulting from the specific budget line in cases when only a share of the line was environmental. For the recorded subsidies from the specific budget line, the same share from each subsidy is taken and no consideration is given as to who the receiver is.

An example is international environmental aid where 11 percent of the Swedish International Development Agency's (SIDA) total aid is taken as environmental, since that is the share which they state is paid out primarily for environmental purposes.

Source: Statistics Sweden, 2005

Tax subsidies and hidden subsidies

Subsidies can be classified as direct and indirect subsidies. An indirect subsidy does not have the purpose of directly influencing the level of production, prices or remuneration of the factors of production. An example is a tax subsidy which is a reduction of the normal rate of taxation.

Tax subsidies are not included in the definition of environmental protection expenditure although they could have a large positive impact on the environment. The reason is that there is no extra cost involved. In effect, they are incentives for more environmentally friendly actions as they reduce the tax paid because of the kind of activity carried on or profit tax. However, the amount of tax subsidies is not clearly identifiable in the National Accounts. They are thus not included in the amount to be recorded in the EPEA or in the JQ.

*Example 4.9: The tax subsidies in **The Netherlands***

There is the "MIA" (environmental investment deduction) arrangement. According to this, depending on how large the positive effects of the investment are on the environment, 15 or 30% of the investment sum can be directly deducted from the profits before taxation in the year investment is made.

Furthermore, especially in the case of energy saving investment or investment in machinery making use of sustainable energy, there is the so-called "EIA" (energy investment deduction) arrangement. The "EIA" scheme allows an extra deduction from your taxable profit if the corporate asset purchased meets the energy performance criteria required.

Source: Internal note, F.Wentink, CSB Netherlands

4.5.4 Intra-governmental transfers

Current transfers within General Government include transfers between the different sub-sectors of General Government with the exception of taxes, subsidies, investment grants and other capital transfers, as described above. Under the national accounts current transfers net each other out and have no effect on the overall spending incurred during the reporting year.

The current transfers within General Government do not include transactions on behalf of another unit. These are recorded only in the resources of the beneficiary unit on whose behalf the transaction is made. This situation arises particularly when a government agency has directly transferred the taxes collected, in total or in part, to another government agency. In this case, the tax receipts destined for the other government agency are shown as if they were collected directly by that agency.

On the other hand, transfers of tax receipts which form part of a block transfer from central government to another government agency are included in current transfers within General Government.

Transfer payments should be analysed in some detail distinguishing the beneficiaries. For example, within the transfers paid by the environment ministry, transfers to environmental funds, to municipalities, to private companies, to households or to other countries can often be distinguished.

Some current transfers, investments grants or preferential loans given for funding environmental investment, or government receipts from earmarked pollution taxes could often be related to expenditure recorded already. Thus it will lead to a double-counting if the transfer payments are included as well.

A complementary table should be set up to describe the transfers between the different levels or units of government, in order to avoid double-counting. This table can also be used for publication purposes as it illustrates the flows of funds among different levels of government and between government units and other sectors, as private enterprises. It is in effect important to locate the final receiver of an intra-governmental transfer.

Table 4.9: Example of intra-governmental transfers summary table

	Donors							
Beneficiaries	*Federal government*	*Federal funds*	*Regional governments*	*Regional funds*	*Municipalities*	*Other units*	*Total received*	*Transfer balance*
Federal government								
Federal Funds								
Regional governments								
Regional funds								
Municipalities								
Other units								
Total given								

Source: Adapted from Eurostat, 2002 (a)

4.6 Taxes

From the point of view of the accounting systems of EPE, taxes that are particularly important are:

- Taxes on products levied on EP services (§ 4.6.1) and
- The so-called 'environmental' taxes (§ 4.6.2).

The first category does not concern deductible taxes, e.g. VAT, paid at the moment of purchases of services: it is important to account for these taxes in order to estimate the whole cost arising from the use of EP services.

Environmental taxes include 'earmarked' taxes, i.e. taxes aimed at financing EP activities, and other taxes levied on environmental tax bases: to account for, in particular, earmarked taxes is important in order to describe the financing of EP expenditure by institutional sector. Environmental taxes are specific taxes and are already mentioned in chapter 4.5.

Table 4.10 lists the tax-related variables to be accounted for in the EPEA and JQ, highlighting the ESA 95 variables they belong to.

Table 4.10: Detailed comparison of EPEA and JQ variables: Taxes (VAT, earmarked environmental taxes, other environmental taxes)

Other EPEA TRANSACTIONS	ESA 95 Variables		JQ aggregates and variables	
	Code	Description	Aggr.	Variable
Non-deductible VAT [1]	D211	Taxes on products: Value added type taxes	EXP II	(included but not separately recorded) [2]
Specific environmental taxes (Earmarked) [3] [5]	D212 D214 D29 D59	Taxes on products: Taxes and duties on imports excluding VAT Taxes on products: Taxes on products, except VAT and import taxes Other taxes on production Other current taxes	EXP II	Subsidies/transfers
Other environmental taxes [4] [5]	D212 D214 D29 D59	Taxes on products: Taxes and duties on imports excluding VAT Taxes on products: Taxes on products, except VAT and import taxes Other taxes on production Other current taxes		

[1] In national accounts (and thus in EPEA table B) output is valued at basic prices, which means that it does not include taxes on products whether deductible (VAT type) or not, whereas uses are recorded at the purchaser's price, including taxes on products. This results in a difference between the value of sales and the value of purchases of EP. In the EPEA, VAT type taxes are explicitly recorded in Table B1 which is mainly constructed to make a transition from the EP output valued at basic price to the EP output valued at purchasers' prices.

[2] When compiling EXP II from EXP I, the JQ introduces sales (revenues of producers) and purchases (payments by users) of EP services. JQ instructions indicate that EPE should be recorded including non-deductible VAT, which means that purchases (payments) by households should include non-deductible VAT, i.e.:

- Payments by Households will include VAT.
- Payments by private companies will be net of VAT.
- Revenues from selling environmental services should be recorded net of VAT.

Although the JQ is not explicit on this point, payments should also include other taxes on products. However neither non-deductible VAT, nor other taxes on products are receipts of producers (revenues or sales). Therefore there is a difference between sales and purchases (revenues and payments), which produces a difference between EXP I and EXP II.

[3] Taxes (e.g. general pollution taxes) which are not payments for a bought service but where the revenues are earmarked for financing environmental protection measures. In the EPEA these taxes are recorded in Table C, while in the JQ they are included within the variable subsidies/transfers – EXP II.

[4] General environmental or green taxes (such as energy taxes) where the revenues are not earmarked for financing environmental protection measures. In the EPEA these taxes are recorded only in Table C1, while in the JQ they are excluded.

[5] Under the column "ESA 95 " the main categories of ESA 95 taxes listed within environmental taxes are usually classified.

4.6.1 Taxes on products

The taxes on products are taxes payable per unit of service produced or transacted. They are divided into value added type taxes (VAT), taxes and duties on imports and taxes on products except VAT and import taxes. They are non-specific taxes.

Value added type taxes

In ESA, the system of registration is net of deductible VAT. This means that VAT is recorded as being paid only by purchasers that are not able to deduct the VAT they pay from their VAT liabilities. Some producers may be unable to deduct the VAT they pay on their intermediate consumption, e.g. those that are exempt from VAT on their sales, as some government units. The greater part of VAT is therefore recorded in the system as being paid on final uses.

As a consequence, intermediate consumption is recorded excluding VAT whereas final consumption is valued with VAT.

In the EPEA VAT is explicitly recorded in Table B1 in order to make a transition from the EP output entered in Table B at basic prices to the EP output at purchasers' prices. The EP output at purchasers' prices is recorded by kind of use in Table B1 and it is further broken down by user in Table A.

In the JQ, VAT is not shown as such, while the indication is made that fees and purchases of environmental protection services should be recorded including non-deductible Value Added Taxes (VAT).

There are two ways of recording VAT:

- Tax statistics might provide the VAT receipts by products or product groups;

- VAT legislation allows the VAT rates applied to EP services to be ascertained. This VAT rate could be applied to the output figures for that part of output that is purchased by users that cannot deduct VAT. Hence, the part of the output that is used for final consumption must first be estimated.

Example 4.10: The record of VAT in ***Austria***

In Austria, all data for enterprises are available from structural business statistics excluding tax and it is assumed that the enterprises have deductible VAT. For General Government, it is assumed that the whole sector is not liable for VAT.

Source: Working documents of the Working Group "Environmental Expenditure Statistics", 2006

Other taxes on products

In some countries, taxes are collected in relation to some EP services, e.g. taxes on wastewater released to sewage networks. In the ESA, these taxes are recorded as other taxes on production. They are normally paid by the producers of EP services and are therefore already included in the value of output at basic prices. Hence, no revaluation of the basic price to purchaser price is necessary for such taxes. However, there may be

exceptions, as in France. In such cases the accounting treatment of these taxes is the same as that of VAT, i.e. they should be added when the transition from basic to purchasers' prices is made (and in the particular case of the EPEA they should be entered explicitly in Table B1).

Example 4.11: Other taxes on products in ***France***

In France, for example, taxes are levied on the consumption of distributed water and wastewater treatment services that are separately shown on the water bills paid by the consumers. These taxes are not considered part of the basic prices in the national accounts and should be added when the transition from basic to purchasers' prices is made.

Source: Eurostat, 2002

4.6.2 Environmental taxes

The concept of environmental taxes is defined within a harmonised statistical framework developed in 1997, jointly by Eurostat, the European Commission's Directorate General Environment and Directorate General Taxation and Customs Union, the Organisation of Economic Co-operation and Development (OECD) and the International Energy Agency (IEA). The objectives were to prepare a statistical framework that would serve as the base for regular collection and publication of data on the use of environmental taxes in EU and OECD countries.

The statistical framework uses the following definition of an environmental tax (see Eurostat, 2001, *Environmental taxes — A statistical guide*):

"A tax whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific negative impact on the environment."

This definition applies to a particular category of taxes defined within the 1994 SERIEE manual, called 'specific taxes'.

They are taxes whose revenues are earmarked for environmental protection purposes. It is useful to focus on earmarked taxes for analysing the funding mechanisms of environmental activities, for example.

The definition of specific taxes overlaps with the definition of environmental taxes based on the tax base, but they are not identical. Some, but not all, taxes on environmentally related tax bases are earmarked for environmental protection purposes, and earmarked taxes may be related to tax bases other than those used in the definition of environmental taxes.

According to the definition above, there are other environment-related taxes that are not earmarked, e.g. taxes on emissions that are not earmarked for environmental protection.

EPEA takes into account both categories of environmental taxes, i.e. those earmarked and those that are not, while JQ is limited to the earmarked ones only.

It is worth noting that value added type taxes (VAT) are excluded from the definition of environmental taxes. This is mainly because of the special characteristics of this type of tax. VAT is a tax levied on all products (with few exceptions), and it is deductible for many producers, but not for households. Because of this, it does not influence relative prices in the same way that other taxes on environmentally-related tax bases do (see Eurostat, 2001, *Environmental taxes — A statistical guide*).

Specific taxes

Specific taxes are taxes earmarked for environmental protection purposes, i.e. the revenue from these taxes is used for subsidising the production of environmental services, financing non-market activities or paying current transfers or investment grants, capital formation of non-market Specialised Producers or other capital transfers for environmental protection.

Earmarked taxes are taken into account in the analysis of financing of environmental protection both in the EPEA and JQ.

In the EPEA, they are mainly accounted for in Table C to describe how the national EP expenditure is financed by the different institutional sectors.

In the JQ, earmarked taxes are recorded within the variable 'Subsidies/Transfers' and contribute to the calculation of the EXP II aggregate according to the financing principle.

Some earmarked taxes for environmental protection are used to pay subsidies on EP services or investment grants for EP capital formation. As the tax receipts are already included in the value of the output, adding the subsidies financed by these taxes to national expenditure would be wrong.

*Example 4.12: Specific taxes in **Belgium***

In Flanders, the Northern region of Belgium, the taxes on waste, on wastewater and on manure for instance are all transferred to the MiNa Fund, which is devoted entirely to the environment.

The same is true in Wallonia, the Southern region of Belgium, where different funds exist for the protection of water bodies, the protection of groundwater and for waste management. The taxes on waste and wastewater are transferred to these funds.

Source: Internal note, G. Vandille, Federal Planning Bureau - Belgium

Other environment-related taxes

These are taxes levied on a physical environmental tax base, but not earmarked for environmental protection measures, e.g. carbon or energy taxes.

These taxes are not taken into account in the context of the JQ which includes among 'Subsidies/Transfers' only the earmarked taxes.

They are instead considered in the context of the EPEA, where they are in particular entered in Table C1.

In the EPEA, these environment-related taxes neither constitute elements of national expenditure nor contribute to the financing of national expenditure. These taxes are not classified as specific transfers but they are taken into account in Table C1 in order to calculate the 'total environment-related financing burden' in addition to the 'net cost of environmental protection' by sector.

The main objective of Table C1 is to calculate the 'net cost of environmental protection' by sector. This indicator already incorporates the effect of all taxes taken into account somewhere in the EPEA Tables A-C, except for the environment-related taxes that are not earmarked. The net cost indicator incorporates the contribution of taxes already captured

in Tables B1 and A as taxes on products or in Table B as taxes on production (e.g. vehicle taxes on garbage trucks) and those earmarked taxes captured in Table C that were used to finance current national expenditure (see Eurostat, 2002, *SERIEE Environmental Protection Expenditure Account – Compilation Guide*, chapter 5).

5. Data collection and reporting methodologies

Eurostat traditionally regulates which data are needed at a European level while Member States have the freedom to choose what is the most appropriate method for them to compile the data.

Statistics for a given characteristic have the greatest usefulness when they enable reliable comparisons of values for a specific variable through industries, across space and over time. It is also in everybody's interest that data are comparable between countries, both European and other relevant countries. The basis for international comparison exists today in terms of common frameworks, definitions and sets of variables (as expressed in the SERIEE and the JQ and explained in this handbook) and also in terms of standard statistical units and common or compatible classifications.

In order to interpret results correctly, it is important to take into account underlying differences between countries and possible structural changes which might have an impact on the size and structure of the environmental expenditure.

Where similar statistics from various sources exist they should be identified and any differences should be analysed and, if possible, quantified. A discrepancy between two sets of statistics produced by different surveys may be due to differences in the data collection process or in reporting units.

The following paragraphs present the most common reporting methodologies used in Europe.

5.1 Reporting methodologies

The following paragraphs present what is needed for the EPEA and the JQ, in the case of General Government and Specialised Producers. However, it is not exhaustive. A compilation guide and conversion guidelines already exist to give details of the requirements of the EPEA and JQ[42].

5.1.1 General Government (S13)

Basically, for government expenditure, four economic categories of expenditure should be distinguished:

- Purchase of goods and services: it may cover the purchase of goods and services for government own production activities or the purchase of EP services produced by specialised industries under contract with administration. In the latter case, there is a risk of double counting when the output of this specialised industry is recorded under the corporation sector;

- Salaries and social security contributions;

[42] For example, Eurostat, (2002), "SERIEE Environmental Protection Expenditure Accounts – Compilation guide", Luxembourg and Eurostat, (2005), "Conversion guidelines"

- Capital expenditure (gross fixed capital formation and acquisition of land);

- Current and capital transfers (subsidies and investments grants).

In EPEA, General Government is considered in its capacity as a producer in Table B and both as a producer and consumer in Table A; furthermore, it is considered as a financer in Table C.

- In its capacity as a producer, in Table B all costs of production and GFC of General Government are recorded, while in Table A only GFC is entered.

- In Table A the expenditure made by General Government as a consumer is also recorded, i.e. the value of non-market services produced by General Government and consumed as collective consumption. The value of these services comprises the JQ internal current expenditure plus the gross operating surplus of non-market producers, plus the purchases of EP by the non-market producers, less revenues (partial payments) of non-market producers.

- In its capacity as a financer, in Table C specific transfers paid (current and capital) and received (mainly earmarked taxes) by General Government are recorded.

In the JQ, for General Government, expenditure comprises investments plus internal current expenditure less receipts from by-products for the sole non-market activities.

5.1.2 Specialised Producers

In the EPEA, in Table B, all the costs of production and the investments of Specialised Producers are recorded, while in Table A only the investments are entered because the contribution of Specialised Producers to the National EP expenditure is restricted to their GCF. However, these investments include the investments both of market and non-market General Government Specialised Producers. In the EPEA, investments by non-market Specialised Producers within the government sector are recorded under Specialised Producers and not under General Government as in the JQ.

In the JQ, expenditure by Specialised Producers corresponds to internal current expenditure plus investments less receipts from by-products.

5.2 Main data sources, collection methods and reporting

The main objective of this handbook is to show how to build statistical information on General Government and Specialised Producers' EPE that matches both the EPEA and JQ data requirements, the first question to think about is the choice of the data collection method, principally statistical surveys or budget analysis. In this step, the choice between the possible options depends on several factors like the complexity of the organisation of the production among producers in the country or the design of administrative data sources such as budgetary documents or the financial resources available for the data collection activity.

After choosing the data collection method, the second kind of question concerns the methodology for implementing the approach selected and the source of data to choose. Data availability is improving but comparability is reduced mainly due to limitations in the

existing data sources or difficulties in using the existing external sources in an environmental expenditure context.

5.2.1 Budget and National Accounts analysis

Budget analysis

Budget analysis is a method of deriving data directly from the budgetary documents published by the various government units. Economic information on government transactions in these budgetary documents includes the receipts and uses of funds by the various government units.

Within each ministry, province or municipality, the various departments have their own budget, which is presented under various subdivisions and also follows an economic classification (current and capital expenditure, salaries, purchase of goods and services or transfers).

The budget presents the previsions of receipts and uses of funds for the current or next year. The period covered by the budget may be different from the civil year.

A budgetary analysis means running a syntactic analysis. As the label of the budget line is often not sufficient to classify the expenditure as an EPE or not and more information describing the activity are usually needed. Thus each expenditure item is analysed based on all the information available in the budgetary document, such as the description of the expenditure, whether or not the item falls within the field of analysis, its nature and the domain it belongs to. This work requires a detailed list of activities by domain.

In some cases, expenditure items must be split in order to allocate them to environmental protection. For some institutions whose main activity cannot be fully related to environmental protection, it is necessary to estimate which part of the activities is related to EP. This can be done through an analysis of the detailed information from the documents of the corresponding department. Experts should also be consulted to retrieve the appropriate environmental share of expenditure.

*Example 5.1: The classification of budget items in **Sweden***

In some cases, Sweden has used either annual budgets or direct contacts with different authorities in order to take out only a share of a budget line as environmental. Examples are international environmental aid and environmental support to agriculture. For environmental aid, Sweden has taken 11 percent of the Swedish International Development Agency total aid as environmental, since that is the share the agency states is paid out for its primary environmental purposes. An additional 44 percent is paid out to projects having the environment as a secondary goal, but this is not included.

Another budget line affected is the one named “Measures for the structure and environment in landscapes”. It contains among other things, measures for an environmental and rural development plan. Only about half of the paid financial support can be said to be EPE. It also includes other support not possible to classify as environmental, such as measures included for an economically and socially sustainable development in rural areas.

Source: Statistics Sweden, 2005

As budgets do not always clearly define the purpose of transactions, the classification of expenditure in environmental or non-environmental expenditure category, and also in a specific environmental domain can be quite difficult.

Example 5.2: The classification of budget items in ***Norway***

The difficult part of a budget analysis involves the items in the budget that are a combination of several different purposes. These budget items are known as non-homogeneous and require that the environmental portion be identified by some method. Extensive work has been carried out to improve the EP share of non-homogeneous expenditure where the percentage could not be found in the Ministries' budgets.

Step 1: The most correct percentages are probably found where the ministries have given exact budget numbers for environmental protection activities. In these cases the percentages have been calculated using the actual outlay in the budget. The EP budget expenditure is divided by the actual outlay for this record in the central government accounts.

Step 2: Some EP activities are easily identified in the text-part of the budget, but without any specific budget-numbers. For these activities a very approximate evaluation has been made, consisting of identifying whether each activity within a record in the accounts seems quite similar in size. If so, the calculation is simple: if one out of five activities is identified as an EP activity, then EP percentage of this record is set to 20 percent. In some cases, where the activities are not considered of similar size, the percentage is even more roughly set.

Step 3: In identifying the EP part of regular current expenditure of ministries or different public institutes, the percentage of employees working with environmental related issues has been used. Documentation of employees is usually not found in the budget, but rather in separate annual reports or from information on the website. For the ministries, the internal telephone book has been used. This percentage (ratio of the number of employees working with the environment to the total number of employees) is then used to estimate the EP part of specific institutions' and ministries' current costs.

There might also be a need to update the information gained from step 3 from time to time. But it is not expected that the changes would be substantial. Another step is thus added to the process when dealing with the changes from one year to the next. In effect, when the central government budgets do not provide any new information about non-homogeneous expenditure, the percentage from last year is used in the calculation for the following year.

Source: Statistics Norway, 2005

Expenditure by central and state government is more significant in some environmental domains. Among Member States, it is thus more frequent to find expenditure in the CEPA domain of protection and remediation of soil, groundwater and surface water (CEPA 4), protection of biodiversity and landscape (CEPA 6), research and development (CEPA 8) or other environmental activities (as formation or general administration) (CEPA 9).

Once the analysis of the budget document has been made, the individual budgetary data items selected must be dealt with.

Some of the flows recorded in the accounts of government are of no further use for the EPEA. This includes, for example, expenditure such as repayment of loans or depreciation allowances.

National accounts and the functional analysis with COFOG

When national accounts are sufficiently detailed, many of the data for the compilation of expenditure accounts are directly available. This holds at least for a major part of the output and use of EP services. Unfortunately, the level of aggregation of national accounts is often rather high, so that transactions relating to environmental protection are not always separately identified. Nevertheless, the need for highlighting environmental expenditure data can be taken into account when national accounts systems are designed and when new classifications are introduced in the national accounts.

For the compilation of the government part of the EPEA0 National Accounts should be used in preference to budget data as accounts data refer to actual transactions.

Example 5.3: The analysis of National Accounts in ***Denmark***

In Denmark, national accounts are used to compile EPE accounts. A 6-step method is followed to derive EPE accounts from national accounts.

The first step is to look at the classification used in the national accounts and to select those industries that appear to be more or less "pure" producers of EP services.

The second step is to find out which information on the production of EP services is embedded or separable from industries that produce EP services in addition to non-environmental services or products. Often, hidden information on EP services can be found in the basic statistics and databases underlying the national accounts. In the Danish national accounts, information on the output of EP services is separable from the information on output of non-environmental services from General Government by using the information in the database on public finance accounts that are used as an integrated part of the national accounts.

The third step is that Table B of the EPEA can be filled in on the basis of this information with respect to the output of EP services by Specialised Producers.

Thus a fourth step could involve the isolation of the rows in input-output tables that concern the industry in question.

The fifth step is to build the EPEA Table B1 (supply-use table) on the basis of the information derived in step four and the EPEA Table B (production table).

The sixth step is to complete the remaining Tables A (uses table), C (financing table) and C1 (net cost of environmental protection table) of the EPEA.

Source: Eurostat, 2002 (a)

Note: The Task Force working on the implementation of COFOG agreed to use the purpose criteria to allocate expenditure with a COFOG code.

For example, "foreign aid for environmental protection" has the motive of environmental protection and is classified in COFOG 05. The group should be identified according to the specific project. If that is not possible, expenditure should be allocated to "environmental protection n.e.c." (05.6).

"Government support of sustainable energy or energy saving technology" could be basically classified in COFOG 05:

- 05.3 for pollution abatement (which measures contribution to environmental quality, including air quality);

- 05.6 if it is not possible to allocate to 05.3.

But allocation to some other functions is possible depending on the final aim of providing a subsidy. Possible coding is:

- 04.3.5 for energy conservation;

- 04.3.6 for promotion of use of non-electric energy.

"Water management" budget lines concern management to control the water level and to prevent flooding. In general, inland water management activities (other than flood defence) should be classified under COFOG 06.3.1 or COFOG 04.2.1 (agriculture) in case of irrigation systems. Flood defence activities fall under COFOG 04.2.1 as well. All these cases are NOT considered as EPE.

Analysis of General Government transactions is an integral part of the national accounts process. The main objective is to assess the value of the output of government units and to distribute it according to the various products, such as, for example, education services or health services. The methods produce data consistent with other national accounts aggregates.

Like all other units of the national economy, the units of the government sector are classified according to their main activity. However, except when detailed government accounts are available to identify different activities so that the main activity is easy to determine, most units of the government sector may be classified in class 75 of the NACE Rev. 1.1 "public administration and defence industry"[43].

The transactions of governments are also classified according to the classification of the functions of the government by their purpose, which allows the compilation of the corresponding production and generation of income (COFOG). However, when the COFOG is not applied at a sufficient level of detail, a specific analysis has to be made for EPEA purposes.

In COFOG, a full division is dedicated to environmental protection. Within this division, six groups based upon the environmental domains of the CEPA are distinguished.

[43] The class 75 of the NACE Rev 1.1 will be separated in several classes in the NACE 2, namely in the 81, 82, 84, 88 and 91 classes.

However, as all expenditure should be classified under one and only one position of the classification, in some cases EP expenditure or multi-purpose activities may be classified under another item. As a consequence, some other position of the COFOG may also be relevant for the identification of EP expenditure. For example:

- 01.2.1: Economic aid to developing countries and countries in transition;
- 01.3.2: Over-all planning and statistical services;
- 04.2.1: Agriculture;
- 04.7.4: Multi-purpose development projects;
- 06.1.0: Housing development;
- 08.2.0: Cultural services.

Other functions may also contain some secondary environmental elements. However, it will in general be difficult to identify this EP part in data sets based on COFOG.

Within each group, the items of the units' own production (as administration and operation of related activities) and transfers to other units (as grants, loans or subsidies to support the related activities) should be covered.

In order to quantify EPE for EPEA or JQ purposes, in general, one needs to reclassify public accounts according to two different criteria:

- An economic criterion, i.e. the kind of expenditure according to ESA 95 definitions;
- A functional criterion, i.e. the purpose of the expenditure (environmental expenditure classified by CEPA or non-environmental expenditure).

The economic reclassification is done by bridging the financial codes/categories used in the accounts and the ESA 95 variables. Thus, some expenditure categories that relate to financial transaction are not accounted for in the EPEA Tables.

The functional reclassification can thereby be limited to the expenditure that belongs to the kinds of expenditure to be accounted for in the EPEA. It is thus more efficient to begin with the economic reclassification and then the functional one.

Italy is well advanced in the implementation of the budget analysis linked with COFOG classification as the Italian Statistics Institute (Istat) has developed a method for the collection of data on government EPE. The data are collected from public financial accounts. This administrative data source is exploited by means of different budget analysis methods according to the statistical output to be produced and the kind of General Government unit. The Italian method is presented in more detail in Annex 3 and 4.

The scope of all methods is General Government as defined in ESA 95. This includes some Specialised Producers classified under NACE 90[44], namely the units of municipalities which carry out wastewater and waste management services as their main activity. The other NACE 90 Specialised Producers belonging to the business sector, such as publicly owned enterprises or private enterprises that carry out EP activities on behalf of GG units, so subcontractors, are not covered. Data on these producers are collected according to the SBS regulation through other surveys.

[44] Division 90 of NACE Rev.1.1 will be classified in divisions 37, 38, 39 or 81 of NACE Rev.2.

The method used is explained below.

The automatic systems

The method is based on a system bridging functional classifications used in public financial accounts and the COFOG, in order to produce the aggregate required by the ESA 95 regulation.

The criteria adopted for building up the bridge systems can be summarised as follows:

- In general, each function of the classification originally adopted in the financial accounts is reclassified, preferably under a unique COFOG category;

- Some public administrations are considered as mono-purpose and thus reclassified as a whole under a unique COFOG category;

- In a few cases, some functions or public administrations are broken down between two or more COFOG categories by means of statistical parameters taken from other information.

This system takes out the EP expenditure only from the functions of financial accounts that are labelled by using keywords explicitly referring to environment or territory, for example waste and wastewater. In this way, EPE actually classified or hidden under other functions is not captured, while some non-EPE can be included in the EP COFOG division. It could be the case with, for example, water supply if not shown separately from wastewater expenditure.

In practice, several “bridge systems” are built up, i.e. one for each kind of public administration, due to the fact that the functional classification of the outlays varies among the different kinds of administrations.

The table below presents the Functional reclassification of public budgets: example of ‘bridge system’ for Italian Regional Administrations.

Table 5.1: The "bridge system" used in Italian regional administrations

Functional categories used in the budget		COFOG functions	
Code	**Description**	**Code**	**Description**
1	General administration and institutional organs	1.01.01	Executive and legislative organs
2	Labour	4.01.02	General labour affairs
3	Administrative policy and fire-protection services	3.02.00	Fire-protection services
4	Education	9.06.00	Subsidiary services to education
5	Professional training	9.03.00	Post-secondary non-tertiary education
6	Organisation of cultural services	8.02.00	Cultural services
7	Social protection to persons and households	10.04.00	Family and children
8	Health defence	7.04.00	Public health services
9	Sport and spare time	8.01.00	Recreational and sporting services
10	Agriculture and farming	4.02.01	Agriculture
11	Forests	4.02.02	Forestry
…	…	…	…
16	Water distribution and sewage systems	6.03.00	Water supply
		5.02.00	Waste water management
…	…	…	…
28	Industry and energy sources	4.04.02	Manufacturing
29	Nature protection	5.04.00	Protection of biodiversity and landscape
…	…	…	…

The functional classification of the Italian Regional Administrations includes 34 categories. For the most part, these categories correspond to a unique COFOG function, but there are exceptions such as the category 16 "water distribution and sewage systems" which corresponds to two COFOG functions, namely water supply and wastewater management. The main purpose criterion is generally applied to make the correspondence between categories belonging to the two classifications. However, sometimes, statistical data from official sources are taken in order to split function between different COFOG categories. For example the function "water distribution and sewage system" is split between the corresponding COFOG categories according to the national average production costs of the two kinds of water services, calculated on the basis of data provided by the National Authority for inland waters and waste.

In general, the functional reclassification cannot often be carried out easily. The functional classifications used in public accounts do not include ad hoc categories related to EP expenditure according to CEPA and COFOG definitions. A more "analytical approach" thus needs to be followed.

The analytical method

This method is based on an analysis one by one of each expenditure item included in the public financial accounts, in order to produce data broken down by CEPA and COFOG for EPEA purposes, i.e. according to the functional classifications used in the accounting system.

But two problems are to be solved:

- The first problem is that of information source. The information on the expenditure item may not be enough to decide whether the expenditure item includes environmental protection expenditure. In addition, environmental protection expenditure in the same item can belong to different CEPA classes. Also, one single expenditure item may include environmental and non-environmental protection expenditure.

- The second problem is due to the risk of introducing subjective criteria in the choices made.

These problems are minimised with the two-step method. The first step is exclusively based on the information contained in the accounts. It consists of scanning government budgetary documents in order to classify expenditure in 4 types of expenditure:

- The definitively Not including Environmental Protection Expenditure (NEPE) which is to be excluded;

- Environmental Protection Expenditure homogeneous enough to be classified under only one CEPA category (EPE);

- Non-Homogeneous Expenditure (NHE) which includes both environmental protection expenditure and non-environmental and/or includes expenditure to be broken down between two or more CEPA classes ("multi-CEPA" items);

- Uncertain Expenditure (UE) for which there is not enough information to exclude or select it.

In order to solve these problems, Istat has developed a decision tree based on formal and substantial criteria, and also on the hierarchy of the substantial criteria. This minimises the effect of subjective choices in the analysis and ensures consistency of data over time. The decision tree is presented in Annex 4.

Nine CEPA operational tables are also used as they give detailed and structured descriptions of each CEPA class and provide an operational support for selecting and classifying expenditure items. These tables are arranged in two parts: one for the overall information on the CEPA class concerned and the second part for the description of the content of the individual activities included in within the CEPA classes.

Istat has also drawn a list of Frequently Occurring Cases (FOC) which include the most frequent borderline cases occurring in the Italian public budgets relating to policy fields involving the natural environment but without having any immediate correspondence with CEPA items. This list, based on studies and consultations of experts, reports the "wording" usually used in public accounts, the possible activities hidden behind those wordings and how to classify the activities according to the intermediate groups and classify them by CEPA.

The first step does not lead to the calculation of EPE, only to an intermediate result which does not represent the whole EPE of the accounts, i.e. the identification of the expenditure items for which the analysis stops (NEPE and EPE groups) and those for which further analyses are needed (UE, NHE and multi-CEPA groups).

Thus, after that, in the second step, additional information by means of contacts or documents such as financial documents or ad hoc surveys and statistical methods are used on NHE, multi-CEPA and UE items in order to allocate them either to environmental protection expenditure or to non-environmental protection expenditure groups and to break down the EPE by CEPA classes they belong to.

These statistical methods are based on estimation coefficients calculated by means of physical indicators correlated to the activity inputs or outputs (e.g. number of employees), parameters derived by technical literature and on estimation coefficients calculated by means of official statistics or financial indicators derived from EPE and NEPE quantified after analysing the public account.

As far as coefficients are concerned, priority should be given to parameters calculated on the basis of physical or monetary indicators correlated as much as possible to input or output of the activities funded through the expenditure items to be further investigated. As a last option, coefficients can be calculated on the basis of financial data derived from the public budgets at the end of the functional reclassification process.

The Italian method of financial coefficients is presented in Annex 3 of this document.

This way of doing the accounts analysis is labour intensive. Its effectiveness depends on the quantity and quality of the information provided in the public accounts.

The mixed approach

The automatic system and the analytical system have both advantages and disadvantages. The automatic system allows the whole GG sector to be covered more easily and rapidly than with analytical methods. But analytical methods help to avoid the inclusion of non-environmental expenditure and forgetting environmental expenditure that is classified or hidden under other functions.

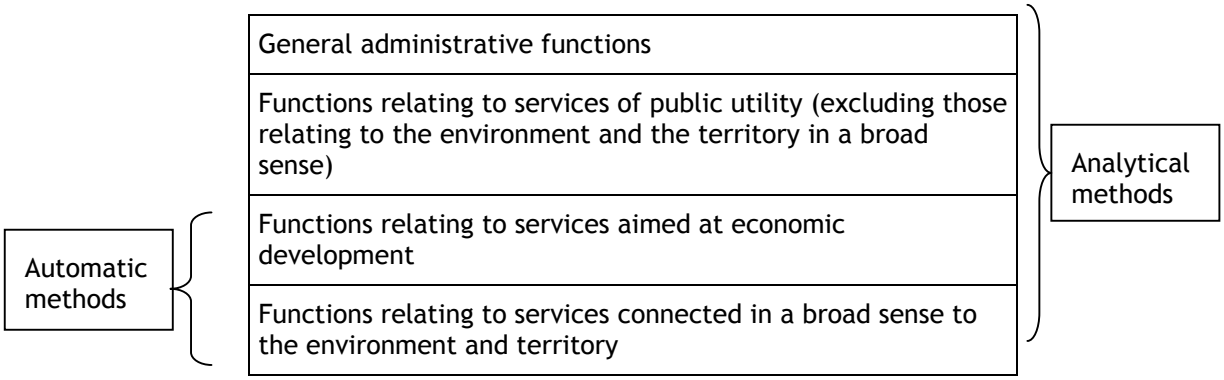
In general, the choice between analytical and automatic methods should take into account the following tradeoffs:

- Accuracy of the estimates produced by analytical methods versus difficulty of applying this method to the whole GG given the amount of work required;

- Completeness of the field of observation more rapidly reached via automatic methods versus the lower accuracy achieved by this method.

The Figure below presents the main functions emerging from public budgets and their consideration in the two different approaches followed for functional reclassification.

Figure 5.1: Methods used for the different functions emerging from public budgets



Which method to adopt can be chosen mainly based on the detail of information contained in the accounts, the mission of the public units in the context of the function to be analysed and on other efficiency reasons.

But a method that integrates both approaches could also be used. It is based on automatic systems for some kind of government units and on an analytical approach for other kinds of public administration.

This mixed approach foresees:

- Analytical reclassification of the entire budget for those administrations that have several institutional attributions in the environment sector and that transfer considerable resources to other public and private bodies for environmental purposes: essentially Central government and Regional administrations;

- Mixed type reclassification primarily centred on functions relating to services connected in a broad sense to the environment for territorial authorities that in general carry out some specific environmental functions: essentially for provinces, municipalities and mountain authorities, by means of:

  - Automatic reclassification carried out with limitation to functions that are sufficiently homogeneous;

  - A break-up by means of statistical methods carried out for non-homogeneous functions to be attributed only partly to the environment and/or to different environmental sectors;

  - Detailed analysis carried out for functions that can be considered as relating to the environment in a way that is much too generic.

- Reclassification of the entire budget as a whole for administrations with very little environmental protection competence or that can be considered as mono-purpose administrations active in the environmental field by means of:

  - Automatic systems with attribution of a unique function to the whole public administration, especially for authorities that do not carry out environmental protection activities (e.g. social security agencies);

  - Ad hoc methods of estimation, especially for public authorities that exclusively carry out very specific functions in the environmental field.

With the automatic system, the breakdown by environmental domain is not enough for JQ and EPEA purposes. With the analytical and mixed system used in Italy, the breakdown matches the JQ and EPEA requirements.

Some overestimations may occur, too, for some particular COFOG groups due to the fact that some expenditure is sometimes fully classified within a unique category while it should be broken down between two or more categories. Despite these specific overestimations, the automatic approach seems to underestimate the total General Government EPE as it does not cover EPE included/hidden in the other sections of the public financial accounts. However, the analytical system provides accurate estimations of EPE because all sections of the public financial accounts are analysed in order to select the expenditure items that include EPE.

With the automatic system, data on Specialised Producers belonging to the government cannot simply be summed together with those concerning the Specialised Producers belonging to the business sector without any risk of double counting. The analytical system helps to avoid the double counting with Specialised Producers due to the fact that the financial accounts of the public administrations are analysed in a very detailed way.

The analytical method is quite labour intensive but a mixed approach is more manageable, even though it requires more labour input than the automatic system.

*Example 5.4: The COFOG analysis in **Spain***

Since EPEA is a Satellite Account of National Accounts, Spain has decided to use COFOG data in order to complete data for General Government in EPEA. However, these data have to be analysed in detail in order to avoid double counting, as waste and wastewater activities are usually carried out by private Specialised Producers at a local level. Those activities are included as intermediate consumption in COFOG. Spain has developed a way to find out whether Specialised Producers' output is included in General Government's intermediate consumption.

For example, COFOG data on 05.1, relating to the environment, at a national, regional and local level are analysed in detail. Then, the structure of output (wages, intermediate consumption) for local, regional and national level in COFOG is calculated. This allows the identification of any items where there could be a problem of double counting.

Then, all sources of information available are examined. For the waste sector, the main source is Waste Statistics - Survey on the collection and treatment of waste (SCTW). This survey exhaustively investigates NACE 90.002 (private and public Specialised Producers). Micro-data can be separated into two groups: public and private. Thus, by using the survey, output structure for both private and public producers can be calculated and compared with COFOG structure.

Since there can be differences in structures for COFOG and for the survey, outsourcing from COFOG intermediate consumption must be taken out. For this, the SCTW variables are used so as to obtain all the information on the public and private sectors and to identify which part was due to outsourcing.

Finally, the output structure for the General Government is calculated again and compared with private sector structure.

Source: Internal Note, M. C. Senin, Instituto Nacional de Estadistica, Spain

Some difficulties encountered with COFOG

There is absolutely no guarantee that the total amount of environmental expenditure identified in the budgets corresponds to the COFOG 05 total published in the National Accounts. Several causes may be at the root of this discrepancy:

- Determining whether a particular budgetary item is primarily of an environmental nature or not remains a matter of judgement.

- For some budgetary items, it is obvious that they serve to finance more than one function of the government. For such items, estimation can be performed of the part that should be attributed to the environmental function, or the entire value of the budgetary item could be attributed to the dominating function.

- The budget is subject to revisions.

Unless one has clearly identified an error in the calculation, the most appropriate action is to apply the distribution across CEPA domains identified during the budget analysis to the COFOG 05 total of the National Accounts.

*Example 5.5: The identification of environmental GFCF in the budget analysis in **Belgium***

The budget analysis for the Belgian federal government enables Gross Fixed Capital Formation for 2001 to be allocated to the CEPA domains. During the analysis, four items were marked as environmental GFCF:

- The Ministry of Defence showed an investment of 1.57 million euros for the military dismantling installation where old ammunition is taken apart. This investment was allocated to the waste domain.

- The budget of the Ministry of Social Affairs, Public Health and the Environment also contained a small part of the investment, namely 0.13 million, which was naturally allocated to the waste domain.

- The budget of the same ministry also contained an investment of 0.0025 million euros for the management of large industrial risks. This was allocated to the domain Other.

- The final item in the budget of the Ministry of Social Affairs, Public Health and the Environment identified investments for the reduction of ozone levels. This item, worth 0.1 million euros was allocated to the air domain.

Thus, 1.8025 million euros were identified as environmental GFCF. However, in the National Accounts, the COFOG 05 total was found to be only 1.64 million euros. The percentages represented by each domain in the 1.8025 million euros were applied to the COFOG 05 total in order to calculate the final values for GFCF by CEPA domains, namely 1.55 for waste, 0.09 for air and 0.0023 for other.

Source: Internal note, G. Vandille, Federal Planning Bureau - Belgium

Some countries do not base their EPE statistics on the COFOG as generally COFOG is not detailed enough and as some COFOG codes could be not correctly chosen. However, a budget analysis could help for the identification of the records which are environmental protection activities. A more important reason is that records in the central government accounts that are only partly EPE are not included in the COFOG as the COFOG coding cannot be split on sub-activities with different purposes.

Example 5.6: Problems with budget analysis in ***Norway***

The statistics developed using a budget analysis by Statistics Norway are not consistent with Statistics Norway's official statistics on Central government's total expenditure by function based on COFOG. EPE statistics are in effect not based on COFOG.

However, a large new project called StatRes has been initiated by the Ministry of Government Administration and Reform to produce efficiency measures for the various functions of central government. There may be an initiative in this process for changing the COFOG coding options in a way that enables splits to be made on sub-activities in the future.

Source: Statistics Norway, 2005

5.2.2 Surveys

Production statistics surveys are generally derived from industrial surveys. Although most of the Member States use surveys, some of them use surveys created especially for the Specialised Producers of EP services and others use already existing surveys.

As surveys are generally restricted to given units, it must be verified that the field of the survey corresponds to the whole universe of Specialised Producers as defined in the EPEA and national accounts. Some surveys are, for example, restricted to units above a given size. The results of surveys must be extrapolated using some other variables as employment or sales. In practice, government units in charge, for example, of the wastewater collection and treatment, may be listed under class 90.00 in the registers but may not be surveyed by industry statistics.

As surveys are generally organised by enterprises and not establishments, characteristic producers may also be found in statistical surveys of industries other than class 90 of the NACE Rev.1.1. As an example, they may be in the 37.10 and 37.20 (recycling), 51.57 (wholesale of metal and non-metal waste and scrap and materials for recycling), 45.11 (demolition and wrecking of buildings) or 45.24 (construction of water projects). But they could also be in the category regrouping firms with other manufacturing activities. For example, firms in the class 25.12, retreading and rebuilding of rubber tyres, may collect and transport waste for recovery[45].

Other limitations of industrial surveys mainly refer to the level of detail. In NACE Rev.1.1. there is no disaggregation of the class 90. That means that it does not allow production accounts to be drawn up by environmental domain, because data are only available for all producers of the class together. However, most countries conduct surveys at a lower level of disaggregation such that waste collection and disposal and wastewater collection and treatment, are often distinguished so that the compilation is easier at national level.

The quality of the data depends on the response rate and, as it takes time to respond to surveys, the response rate is often low. But the quality of data depends also on the comprehension of the questionnaire by the respondents. It leaves room for interpretation by the respondents so there is a risk of heterogeneity in responses. Furthermore, there is a long delay in data processing.

[45] Division 2512 of NACE Rev 1.1 will be classified in division 2211 of NACE Rev.2, division 37 in division 38, division 4511 in division 4312, division 4524 in division 4221 and division 5157 in division 4677.

In the special case of Specialised Producers, double counting could appear if local government send the questionnaire to municipalities that are included in NACE 90.

Use of existing surveys

The introduction of additional variables to an existing survey is more flexible and it is often easier to add an extra variable to an existing survey than to launch an entirely new one. Usually, questions on environmental protection expenditure are added in the field of economic statistics or investments surveys. The part that relates to environmental expenditure could be sent to all units or to a sub-sample of those that receive the total survey.

It is often difficult to add a large new section on environmental expenditure to existing surveys. For this reason, generally, only a limited amount of data is collected. In this way, the advantage in terms of costs is balanced with the disadvantage of the amount of data collected.

Separate surveys on environmental protection expenditure

Some countries have decided to make a separate survey on environmental protection expenditure, usually under the responsibility of the environmental statistics units. A separate survey allows the inclusion of more variables and more detailed definitions, instructions and illustrative examples. The sample can also be targeted to the relevant economic units.

The Bulgarian questionnaire on protection and restoration of the environment is put in Annex 5 of the handbook for illustration.

Example 5.7: The EPE survey in the ***Czech Republic***

Since 2003, a Statistical Survey of the Environmental Expenditure for the business sector has been conducted. The aim of this statistical survey (environmental report ZP 1-01) is to find out the information on expenditure and sources of funding of long-term physical property for environmental protection, on non-investment expenditure on environmental protection, and on economic benefits from activities of environmental protection.

The outcomes of the survey are used for the assessment of the development of expenditure on environmental protection, the regional deployment and sectored stratification of this expenditure, and, last but not least, for the provision of information to EU institutions (according to Council Resolution No. 58/97 from December 20, 1996), and other international organisations.

The measured indicators are:

- Expenditure on purchasing long-term physical property (DHM) for the prevention and elimination of the risk of environmental pollution,
- Financial sources of purchasing long-term physical property funding for environmental protection,
- Internal and external non-investment expenditure on environmental protection (from the enterprise perspective),

- Economic benefits from by-products made in the process of activities concerning environmental protection (returns from environmental protection services, returns from by-product sales, savings from the re-use of by-products).

All these indicators are measured in respect of the classification corresponding to particular areas of the environment (CEPA 2000), and the expenditure on the DHM purchase for environmental protection is, furthermore, classified according to the region for which the investment was made.

The cluster of reporting units is set parametrically on the basis of the Register of Economic Subjects. The obligation to provide information concerns non-fiscal enterprises in the following fields: agriculture, forestry, mining of mineral resources, manufacturing industry, production and distribution of electricity/gas/water, surface and underground transport, air transport with more than twenty staff. This obligation further concerns all non-fiscal enterprises in the field of recycling of secondary raw materials and waste disposal.

The reporting units are obliged to provide required data by the Act No. 89/1995 on State Statistical Service in the Wording of Other Regulations.

The environmental report to be provided has four pages. The first page represents the report header, where all the identification data on the reporting unit, especially the identification number of an organisation, are given. The following three pages display the real expenditure on environmental protection. Furthermore, two pages giving a brief explanation of the methodology used are attached to the report.

As the report was the outcome of a new statistical survey, every reporting unit obtained a more detailed methodological handbook to refer to for better understanding of the issue concerned.

Time schedule of survey data processing:

- Until the end of February, environmental report ZP 1-01 was sent to the reporting units. The reporting units filled in the report, and they sent it back to the Czech Statistical Office by March 31.
- At the end of August, the information processing of particular reports is finished, and the data from the statistical survey ZP 1-01 is gradually being made public.
- The overall expenditure on purchasing of long-term physical property for environmental protection for the year (thus including the data on governmental institutions from the report) is known in December.

Source: Internal note, E. Krumpova, Czech Statistical Office

*Example 5.8: Surveys in **Lithuania***

Statistics Lithuania uses two types of survey to collect data on the business sector. One is the Annual Environmental Protection Expenditure Survey and the second is the Annual Business Survey.

The Annual Environmental Protection Expenditure Survey

The current statistical data from enterprises are collected using a sampling method. The Statistical Profile Business Register is used as a sampling frame.

The statistical part contains number of employees; turnover; status of activity; form of ownership; activity; secondary activity; institutional sector; source; historical data and statistical units.

The kind of economic activity and classification by number of employees into the groups 5-49, 50 and more were used as stratification variables. The sample is drawn independently in each stratum. But all enterprises belonging to NACE 37, 41 and 90 are included in the sample independently of the number of employees.

The variables surveyed are:

- Gross investment for environmental protection (end-of-pipe and changing in the production process);

- Current expenditure (internal and purchases of environmental protection services);

- Receipts from by-products;

- Revenues from environmental protection services;

- Subsidies received.

The Annual Business Survey

Through this survey, several variables are collected in classes 9001, 9002 and 9003 of the NACE Rev.1. Each Specialised Producer is classified according to its ownership (public or private).

The variables collected are:

- Number of employees;

- Sales (or turnover);

- Intermediate consumption;

- Compensation of employees;

- Taxes paid on production;

- Subsidies received for production;

- Gross fixed capital formation.

Source: Statistics Lithuania, 2005

In some countries, specific surveys are directed at local government. These surveys may be general surveys or inventories for local governments of, for example, infrastructure or services existing at a local level. Some questions may refer to, for example, the way in which waste and wastewater collection and treatment services are organised. These surveys may also collect monetary information.

Two types of survey may be considered:

- Surveys that only ask for expenditure in general terms, without detailed disaggregation by type of transaction;

- Detailed surveys that ask for quantities of waste or wastewater collected and treated, the operating costs for collection and treatment, the receipts from sales, the investments or the capital or current transfers. These surveys may be sample surveys.

Example 5.9: The variables surveyed in ***Czech Republic***

The data from all governmental institutions are obtained by questionnaire, where only a table about environmental investment expenditure is included. Using this questionnaire, data on these government departments are obtained: Semi-budgetary organisations, Territorial self-governing units, Regional councils, municipalities (with 500 or more inhabitants), Voluntary unions of municipalities, State funds, National Property Fund of the Czech Republic, Land Fund and Support and Guarantee Fund for Farmers and Forestry.

Since 2003 environmental expenditure has been divided into nine groups:

- Investment in air and climate protection

- Investment in wastewater management

- Investment in waste management

- Investment in protection and remediation of soil, groundwater and surface water

- Investment in noise and vibration abatement (excluding workplace protection)

- Investment in biodiversity and landscape protection

- Investment against radiation (excluding external safety)

- Investment in research and development

- Investment in other environmental protection activities

There are seven financial sources surveyed from the viewpoint of environmental investments. These sources are:

- One’s own sources

- Budget (it can be filled only by government departments, territorial self-governing units and semi-subsidies)

- Grants and subsidies from public budget

- Grants and subsidies from abroad

- Grants and subsidies from other sources

- Loans and financial assistance

- Securities emission, free transfers, non-monetary deposits, delimitation, etc.

Possible breakdowns of the environmental expenditure are by: environmental domains, structure of financing, NACE code, structure of ownership (private, cooperative, state, municipal, clerical), I-Sector of National Accounts or region

Source: Internal note, E. Krumpova, Czech Statistical Office

Example 5.10: The variables surveyed in ***Lithuania***

In Lithuania, data on environmental expenditure of municipalities are collected by a total survey. There are 60 municipalities in Lithuania.

The variables surveyed are:

- Gross investments (only end-of-pipe);

- Current expenditure (internal and purchases of environmental protection services);

- Receipts from by-products;

- Revenues from environmental protection services;

- Subsidies paid.

Source: Statistics Lithuania, 2005

5.2.3 Registers

Structural business statistics (SBS) describe the economy through the observation of units engaged in an economic activity, which in SBS is generally the enterprise. The main variables collected in the framework of structural business statistics are:

- Demographic variables: number of enterprises, number of local units;

- "Input related" variables: number of persons employed, number of employees, personnel costs, gross investment in tangible goods;

- "Output related" variables: turnover, production value, value added at factor cost.

These variables are collected for all market activities.

SBS covers the NACE Rev 1.1 sections C to K, which are organised in four annexes, covering Industry (sections C-E), Construction (F), Trade (G) and Services (H, I, K). Financial services are covered in three specific annexes and separate metadata files are compiled.

Structural business statistics also cover more detailed sector-specific variables. The detailed definitions of all SBS variables and the detail level and breakdowns required are included in Commission Regulation (EC) No 2700/98 of 17 December 1998, amended by Commission Regulation (EC) No 1670/2003 of 1 September 2003.

Note: There is currently a revision of the SBS where the inclusion of NACE O, Other community, social and personal service activities, is proposed to Annex 1.

5.2.4 Other data sources

In most countries, trade or industrial associations carry out their own surveys or estimates as concerns their output or employment. Industrial associations may have specific registers of their members according to detailed specialisation. Environmental yearbooks or reviews or environmental associations may provide lists of firms specialised in EP services which may allow the identification of producers of environmental services in national business or VAT registers.

Government agencies are created to take care of some specific environmental issues such as, for example, funding environmental protection research and development. These agencies may cover one or several domains or sub-domains, general or specific issues but also a specific geographical area. They may supervise non-profit institutions or collect taxes whose revenues are used for environmental protection.

Annual reports and accounts of these agencies may be collected and analysed, complementary to the accounts of government. The analysis of these reports may be useful because the analysis makes it possible to:

- Have a source for the description of the environmental sector, the identification of environmental legislation and the establishment of a detailed classification of activities and also other units involved in environmental protection;

- Distribute in a deeper way multipurpose expenditure between environmental protection and other issues and typical environmental expenditure between domains;

- Assess the use of subsidies and other transfers paid by central government;

- Allocate the receipts of specific taxes and other income to environmental protection.

For these government agencies, the data will be of the same kind as that for government. Their reports generally provide physical data, such as the volume of waste collected or the area of land purchased for environmental protection.

5.2.5 Mixed approaches

As different sources individually could be insufficient to have complete data on environmental expenditure of Specialised Producers, in terms of volume of expenditure or number of Specialised Producers, it could be useful to consider different sources of data and different methods.

*Example 5.11: The mixed approach in **Italy***

The data on EPE of Specialised Producers are not collected by means of a unique method.

Data on Specialised Producers belonging to the General Government (GG) as defined in the ESA 95 are collected from the public financial accounts by means of different kinds of budget analysis techniques. In Italy, the public Specialised Producers belonging to the NACE 90 include only GG units of municipalities that carry out wastewater and waste management activities as their main activity.

Data on Specialised Producers belonging to the business sector, including publicly owned enterprises or private enterprises which carry out EP activities on behalf of GG units (thus subcontractors) are collected through the annual surveys on economic accounts of enterprises according to the SBS regulation. Two different surveys are made on enterprises' economic accounts: one for enterprises with less than 100 employees and another for enterprises with 100 or more employees.

Source: Istat, 2005

For central government, a direct analysis of budgetary documents is often manageable due to the limited number of units that must be analysed.

For local governments, the number of units (municipalities or associations) may be substantial. Furthermore, the level of disaggregation in their accounts may be rather low so that only highly aggregated data are available. Thus, a combination of different sources and methods may be useful. For example, large units may be subject to budget analysis and small municipalities to sample surveys.

A careful analysis of the data of each source is necessary to avoid double counting. In particular, it is necessary to verify that these units are not already covered by another source such as, for example, industrial surveys, and to verify whether or not subcontracting or delegation of public services to private or public enterprises plays an important role and how this subcontracting can be retraced in the data.

*Example 5.12: The mixed approach in **Sweden***

The method used to collect public EPE in Sweden can be described in 5 steps.

- The first step is to examine the definitions of the different variables and EPE. The main definition is concerned with costs relating to EP.

- The second step is the identification of EPE within the government budget lines. Four different items are collected for each given budget line classified as environmental in some way, namely investments, consumption, financial transactions (which are later excluded as amortisations and interests are not EPE) and transfers. Firstly, those classified as COFOG 5 (environmental protection) are included. Thereafter, the budget proposals are read in detail to make it possible to classify several more budget lines as EPE. It is not only budget lines classified as COFOG 5 that are environmentally related and not all expenditure classified as COFOG 5 has the primary purpose of environmental activities. But as it is often impossible to discern how much of a budget line is environmental with the information given in the budget proposals, both annual reports or direct contacts with the authorities have been used as a source to take out only a share of the budget lines'

expenditure. For example, 11 percent of the Swedish International Development Agency's total aid is presumed to be for environmental aid, since that is the share primarily paid out for environmental purposes.

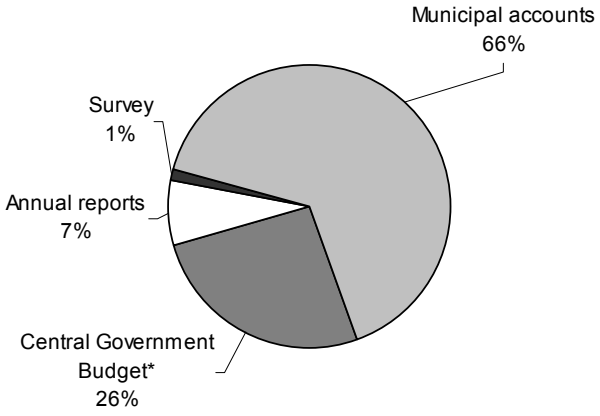
- Other sources, such as annual reports and contacts with the authorities, are consulted in order to identify EPE that cannot be determined from the results of the government budget.

- Several important EP areas in Sweden are the responsibility of local government, including areas with large expenditure such as waste and wastewater. The expenditures for municipal EP have been collected for four activities from municipal accounts within Statistics Sweden:

  - Environment and health protection authority exercise;
  - Environment, health and sustainable development;
  - Water supply and sewage treatment;
  - Treatment of waste.

- The data should be recorded together with the information needed. It should be decided if the expenditure is in accordance with CEPA and it should then be classified according to environmental domains.

The graphic below shows the percentage of data coming from the different sources of data for environmental expenditure in 2004 in Sweden.



* Including county administrative boards

What data has been used from the different sources?

- Government budget: data from budget lines within the environmental field;

- Annual reports: environmental protection expenditure within central authorities not identified by study of the government budget or by survey;

- Small surveys/questions to authorities: environmental protection expenditure within central authorities not identified by study of the government budget or annual reports, for instance expenditure for environmental management;

- Annual accounts for municipalities: environmental protection expenditure for municipalities.

Since several sources are used to estimate the public expenditure, there is a risk that some data overlap each other. To avoid double counting, between the government, county administrative boards and municipalities, transfers to municipalities from the government budget are excluded. Because this often goes via county administrative boards, it is excluded there as well. One example is the transfers for liming.

Source: Statistics Sweden, 2006

The case of Research and Development expenditures

The Frascati manual[46] defines Research and Development (R&D) as "creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this knowledge to devise new applications".

Whereas R&D statistics are collected by means of specially designed surveys, government R&D funding data generally have to be derived from national budgets, which are based on their own standard methods and terminology. Budget-based data are referred to as "government budget appropriations or outlays for R&D" (GBAORD).

This essentially involves identifying all the budget items involving R&D and measuring or estimating their R&D content in terms of funding. These estimates are less accurate than performance-based data but as they are derived from the budget, they can be linked to policy through classification by "objectives" or "goals". GBAORD data measure government support to Research and Development activities, or, in other words, how much priority governments place on the funding of R&D.

GBAORD covers not only government-financed R&D performed in government establishments but also government-financed R&D in the three national sectors (business enterprise, private non-profit institutions and higher education) in addition to abroad (including international organisations). It includes public general university funds. GBAORD includes both current costs and capital expenditure.

Belgium and Norway use GBAORD in JQ reporting and record it in the domain "other".

The classification of the R&D is done according to the primary objective. For example, a research project to develop fuel cells to provide power in remote forest locations financed by the Ministry of Agriculture will be classified in the "agriculture, forestry and fishing" and not in "energy", even when the R&D content is "energy".

The R&D in environmental protection is regrouped in the COFOG category 5.5.

[46] The OECD published Frascati manual in 2002 for national experts in member countries who collect and issue national R&D data and submit responses to OECD R&D surveys. It is today globally recognised as a standard.

6. Presentation and interpretation of results

The objective of this chapter is to show how to use the results, on an aggregate level, how important and useful are the different variables, different environmental domains and the sectors concerned.

EPEA analysis and interpretation can improve the approach to the information that the decision-maker can use to take a decision. Linking expenditures data with physical data could bring valuable insights on several issues relating to environmental strategies.

For example, it can be used for cost-benefit analysis of proposed new regulations and policies. To do so, it is essential to show how expenditure relates to environmental protection policies. For example, expenditure should make it possible to follow a country's waste or wastewater policies showing the changes in the costs for the collection and treatment of waste due to more stringent regulations, changes in government expenditure due to privatisation of wastewater management, or changes in the structure of expenditure when new legislation leads to higher investments.

Indeed, the usefulness of data on environmental expenditure by General Government and Specialised Producers is strictly linked to the analyses that are allowed by the EPEA-type information. This type of information helps to respond to different categories of questions, such as:

- How much is spent on activities producing environmental protection services?
- How much of the production is carried out for third parties by operators specialising in environmental protection activities ("Specialised Producers", such as municipal enterprises) and how much is instead carried with respect to other activities or for one's own use and consumption to reduce self-produced environmental pressures ("Non-Specialised Producers")?
- To what extent does the General Government assume responsibility for such production (breakdown by institutional sector)?
- To what extent do the various sectors of economic activity assume responsibility for the production of environmental protection goods and services (breakdown by sector of economic activity)?
- Do the various users entirely bear the cost for the purchase of the environmental goods and services they use, or are the costs in part borne by other institutional sectors?
- To what extent does each institutional sector finance environmental protection expenditure incurred by other sectors (for example, financing flows from households and enterprises to GG by means of fees, charges and taxes that finance the cost of certain services purchased by GG for collective consumption; grants provided by GG as an incentive to choose environmentally friendly investments (ex. the adoption of environmentally friendly technologies)?
- To whom and to what extent does the financial burden for environmental protection fall?
- To what extent does environmental protection expenditure (total, by General Government, etc.) impact on total economic expenditure?
- In which sectors of environmental intervention is such expenditure concentrated?

- Considering the trend in pressures on the quality of the environment, are the sectors with higher levels of pollution (the more polluting activities) the same as those that spend more on environmental protection?

The data produced by means of environmental expenditure accounts such as the EPEA can be analysed in many different ways. These include:

- Analysis by individual sector: for example, public expenditure for environmental protection in relation to total public expenditure;

- Comparison of the different sectors: for example, the percentage distribution of the financial burden for environmental protection amongst enterprises, households and General Government;

- Comparison of the different environmental domains: for example, the percentage distribution of the financial burden of environmental protection amongst waste management, waste water treatment, etc;

- Analysis by environmental expenditure variable: for example, capital expenditure for environmental protection versus current expenditure; financing flows from households and enterprises to GG by means of fees, charges and taxes; grants provided by GG as an incentive to choose environmentally friendly investments, etc;

- Analysis of physical data linked to expenditure data: for example, physical data on environmental protection equipment and plants (such as the capacity and population served by the water treatment plants) for analyses of efficiency; or physical data on pressures managed via environmental protection activities (such as waste management) for analyses of effectiveness or of the degree of application of the "polluter pays principle", etc.

6.1 Analysis by individual sector

The EPEA aggregates are closely comparable with national accounts main aggregates. Ratios between EPE and national accounts may thus be calculated and expenditure has to be related to other variables, such as Gross Domestic Product (GDP) or Gross Fixed Capital Formation (GFCF).

Another relevant figure is the proportion of public expenditure for environmental protection from the total of GG expenditure.

As an example, Table 6.1 below presents an estimate of the aggregate net expenditure on environmental protection by the UK government sector for the years 1996/97 to 2000/01. It shows the evolution of EP for one sector, General Government, in relation to the GDP.

It was estimated that environmental protection expenditure by the UK government sector increased from £3.2 billion in 1996/97 to £4.2 billion in 2000/01. The average annual growth rate over the period, at 7%, was slightly higher than for other aggregates in the economy. As a result, expenditure increased marginally as a percentage of GDP.

Table 6.1: Net government sector expenditure on EP in the UK, 1996/97 to 2000/01

	Total net expenditure, £ million, current prices	Increase on previous year (%)	Increase in GDP (%)
1996/97	3.210		
1997/98	3.535	10.1	6.6
1998/99	3.630	2.7	5.5
1999/00	3.910	7.8	4.9
2000/01*	4.185	7.0	4.8

- Source: Office for National Statistics, UK, 2001
- Data for 2001 is provisional

6.2 Comparison of the different sectors

Responsibilities that are considered traditional for central government include regulation and control, surveillance and general administration. Activities such as waste collection and wastewater treatment have been the responsibility of local government for a long time.

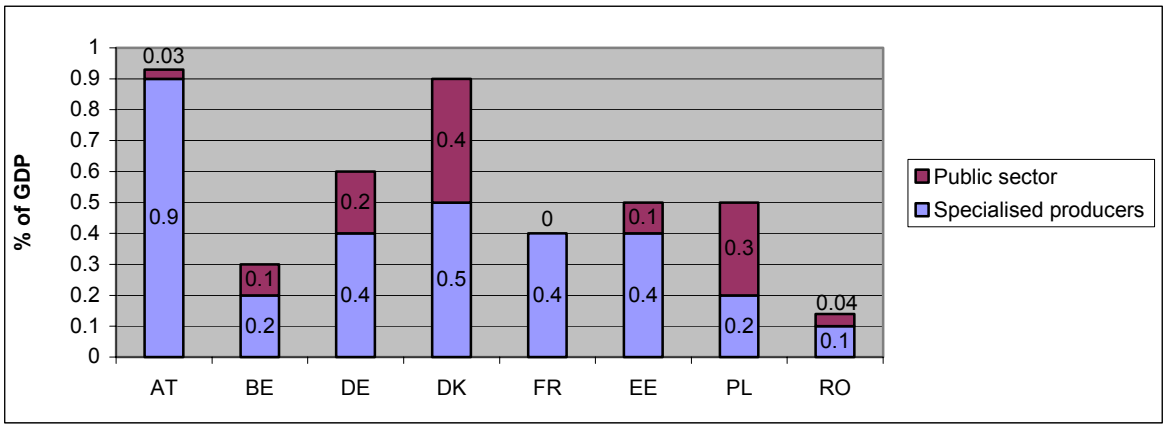
However, the privatisation, or in some cases semi-privatisation, of these services have caused a shift in expenditure from the General Government to the Specialised Producers sector. Differences in the degree of privatisation can also to some extent explain variations in expenditure between the two sectors in the different countries. Because of this, it is important to analyse the two sectors jointly in order to get an overview of the total amount spent on these types of environmental protection activities regardless of who is actually providing the service.

One can also analyse expenditure for the different institutional sectors based on the EPEA relative to the waste management sector (category 3 of the CEPA) and see how the supply of waste management services breaks down between Specialised Producers belonging to the General Government and private enterprises, highlighting to what extent some enterprises produce this type of service for their own use and consumption (ancillary production).

One can also analyse utilisations by type of use (final consumption, intermediate consumption, etc.) and thus by type of user (households, enterprises, GG), leading to a calculation of national expenditure for waste management by user. Then, taking account of the transfers among different sectors of the economy, national expenditure by user can be broken down by financer. This allows for calculations regarding, for example, the percentage of national expenditure that is self-financed by each user or the financial burden for waste management borne by each sector, including self-financed expenditure and financing of other areas.

Figure 6.1 below presents the differences in the relative weights in percentage of GDP of the General Government and the Specialised Producers groups in wastewater management, in some European countries.

Figure 6.1: EPE of General Government and Specialised Producers in wastewater management, in percentage of GDP, most recent year available



- Source: Eurostat, Statistics in Focus 10/2005
- BE, DK: 2000; AT 2001; DE, FR, EE, P, RO: 2002
- For DE, only the Specialised Producers of General Government

This analysis makes it possible to establish who bears the financial burden of environmental protection and to what extent.

The distribution of environmental protection expenditure between General Government and Specialised Producers depends on how environmental protection is organised in each country. In the example, it can be seen that in Austria, the percentage of GDP created in the wastewater management is generated more by the Specialised Producers group than by General Government. In Poland, on the contrary, the public sector generates more GDP in wastewater management than the Specialised Producers.

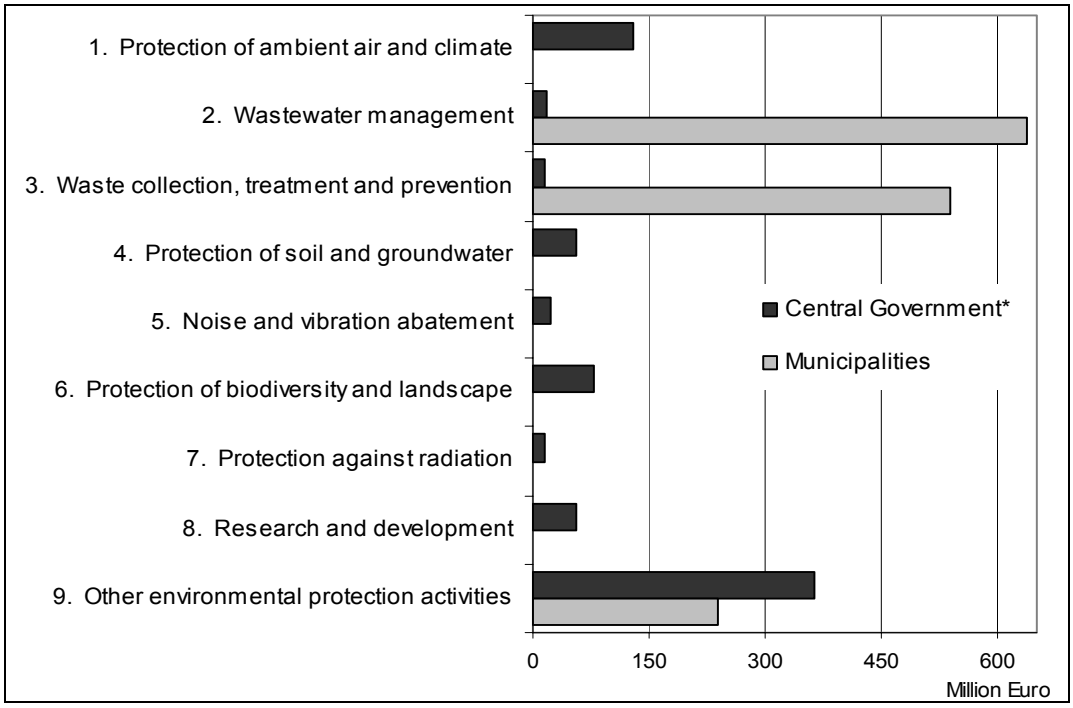
6.3 Comparison of the different domains

Expenditures by environmental domain provide a general indication of a country's financial efforts directed towards that domain. EPE can give an indication of the type and level of service that the country provides for the different environmental domains (for example, waste management) and the relative importance that it attaches to the domain in relation to other services.

One particular application is the use of estimates of public sector spending on the protection of biodiversity as one of the headline indicators of progress towards the Council of the European Union target, set in 2001, to halt biodiversity decline by 2010.

As an example, the Figure below presents the distribution on environmental domains for central government and municipalities' environmental protection expenditures.

Figure 6.2: Public environmental protection expenditure per sector in Sweden, in 2004



Including county administrative boards
Source: Statistics Sweden, 2005

6.4 Analysis of environmental expenditure variables

The main objective of the EPEA is to analyse the demand and supply of environmental protection services. It is structured in order to allow various indicators to be derived from the accounts. The first indicator is the basic aggregate of the EPEA, namely the national environmental protection expenditure, with its two main components: current and capital expenditure. The aggregates can be related to national accounts aggregates such as GDP, final consumption or gross fixed capital. These relationships indicate the importance of environmental protection expenditure as a share of the overall resources and uses of the economy, and thereby the efforts made by the society to reduce pollution.

One can also analyse across variables. For example, whereas current expenditure generates “well-being” in the present, capital expenditure lays the groundwork for future prosperity.

Table 6.2 below presents the environmental protection expenditures of the General Government pertaining to the UE 25. It is an estimation from Eurostat for the period from 2000 to 2002. These expenditures are classified according to the related environmental domain but also according to their nature, namely current expenditure or investment.

Table 6.2: EPE per domain, General Government UE 25 2000-2002, in millions of euros. Eurostat estimations

	Air	Waste	Wastewater	Others	Total	Part of GDP	Euros per inhabitants
2000							
EPE	2%	33%	22%	43%	50,214	0,56%	111
Investments for environmental protection	3%	11%	43%	43%	12,701	0,14%	28
Current expenditures for environmental protection	2%	41%	15%	43%	37,513	0,42%	83
2001							
EPE	3%	32%	16%	49%	54,243	0,58%	120
Investments for environmental protection	4%	8%	41%	47%	11,969	0,13%	26
Current expenditures for environmental protection	3%	39%	9%	49%	42,274	0,45%	93
2002							
EPE	2%	27%	8%	63%	50,893	0,53%	112
Investments for environmental protection	4%	10%	23%	64%	12,310	0,13%	27
Current expenditures for environmental protection	1%	33%	3%	63%	38,583	0,40%	85

Source: Eurostat, Statistics in Focus, 10/2005

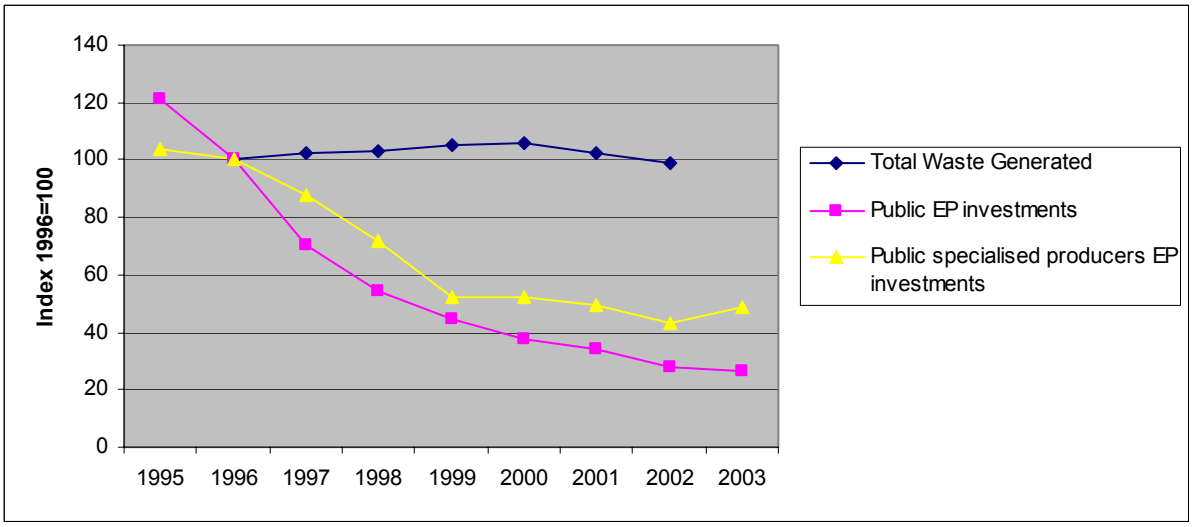
6.5 Analysis of physical data linked to expenditure data

The relationship between expenditure and the state of the environment can only be explored with supplementary information on the overall context of a country. Out of context, high EPE can be associated both with low environmental quality (the situation makes expenditure necessary) and with high environmental quality (which has improved as a result of the EPE).

Also the trend in EPE should be interpreted with caution: if, at some point in time, all production processes use cleaner technology and no emissions are created, no further environmental protection will be required. Hence, in the long run the trend in environmental expenditure may be downward sloping.

Figure 6.3 below presents the evolution of the index over total waste generated and EP investments made by the government and public Specialised Producers during the period 1995 – 2003 in Germany. This figure shows that total wastes generated (and treated) are relatively stable, while producers of the services are reducing their investments.

Figure 6.3: Evolution of the index over EP investments and waste generated in Germany between 1995 and 2003



Source: Eurostat, Dissemination database

Joint analysis of information coming from the different environmental accounts (for ex., NAMEA and EPEA) can thus provide a framework for the state of the environment of a given sector/sub-sector and of the intensity of the responses to environmental pressures.

For example, based on the trend in environmental pressures as reported in the NAMEA-type accounts and asset accounts of natural resources, one can analyse the part of public and/or private operators that report a greater response based on environmental protection expenditure accounts.

In this way, EPE is an indicator of the response from society to reduce environmental pressure and move towards sustainability. However, one should take into account that improvements are also made as part of day-to-day activities, where no specific expenditure to protect the environment can be identified. In addition, high levels of spending could be a result of new, stricter policies in a country where much has already been done to reduce pollution and where the marginal cost is high, or could be a result of long periods of no spending.

For these reasons, an analysis focused on the links to physical data (size of emissions, amounts of waste, etc.) is recommended.

If the amounts spent on environmental measures are not necessarily proportional to their environmental efficiency, environmental expenditure may reflect the implementation of the polluter pays principle. According to this principle, one polluter must take into account the reduction, prevention, compensation or reparation of environmental damages. Doing this, he internalises the negative externalities that he inflicts to his environs. In effect, the neighbourhood endures a diminution of its welfare that is not compensated nor supported by the polluter, without any external intervention.

Physical data on pressures managed via environmental protection activities (such as waste management) can be linked to environmental expenditure data for analyses of effectiveness or of the degree of application of policies such as the “polluter pays principle”.

Annex 1: The CEPA classification

INTRODUCTORY NOTES

CEPA 2000 is a generic, multi-purpose, functional classification for environmental protection. It is used for classifying activities and also products, actual outlays (expenditure) and other transactions. The classification unit is often determined by the units of the primary data sources that are being classified and by the presentation formats used for results. For example, the analysis of government budgets and accounts requires the coding of items of government environmental protection expenditure into CEPA. Some of these expenditure items will be transfers such as subsidies or investment grants whereas others will be inputs into an environmental protection activity (e.g., wages and salaries). The compilation of environmental expenditure accounts requires determining environmental protection activities and their output of environmental protection services by categories of CEPA.

CEPA is designed to classify transactions and activities whose primary purpose is environmental protection. The management of natural resources (e.g., water supply) and the prevention of natural hazards (landslides, floods, etc.) are not included in CEPA. Resource management and prevention of natural hazards are covered by broader frameworks (e.g., SERIEE, SEEA 2000 or the OECD/Eurostat environment industry manual). Separate classifications for e.g. resource management should be set up which, together with the CEPA, would be part of a family of environment-related classifications.

Environmental protection activities are production activities in the sense of national accounts (see e.g. SNA § 6.15 or ESA § 2.103), i.e. combining resources such as equipment, labour, manufacturing techniques, information networks or products to create an output of goods or services. An activity may be a principal, secondary or ancillary activity.

Environmental protection products are

· the environmental protection services produced by environmental protection activities,

· adapted (cleaner) and connected products.

The expenditure recorded is the purchasers' prices of environmental protection services and associated products and the extra costs over and above a viable but less clean alternative for cleaner products.

Expenditure for environmental protection is outlays and other transactions related to:

a) Inputs for environmental protection activities (energy, raw materials and other intermediate inputs, wages and salaries, taxes linked to production, consumption of fixed capital),

b) Capital formation and the purchase of land (investment) for environmental protection activities,

c) Outlays of users for the purchase of environmental protection products,

d) Transfers for environmental protection (subsidies, investment grants, international aid, donations, taxes earmarked for environmental protection, etc.).

For the presentation of aggregate results and indicators of expenditure, care is needed when adding up expenditure of different types. Available frameworks such as the SERIEE or

the OECD/Eurostat PAC framework offer ways to avoid double counting of items of expenditure. In particular, they offer guidance on how to avoid mixing transfer payments with the expenditure that is financed by the transfers and purchases of environmental products with the expenditure for their production.

Classification structure

The level 1 structure of CEPA (the 1-digits) are the *CEPA classes*. CEPA classes 1 to 7 are also called *(environmental) domains*. The main function of most 2-digits and 3-digits in CEPA is to guide classification into the classes. Selected 2-digits and 3-digits may also be used for data collection and coding as well as for publication purposes. In statistical practice, countries will have to adapt the CEPA structure to some extent, reflecting national policy priorities, data availability and other circumstances. Examples include separate 1-digit headings for traffic, international aid, energy savings programmes, general administration of the environment or soil erosion. For international comparison purposes the level 1 structure of CEPA should be fully respected.

General classification principles

Classification should be made according to the main purpose taking into account the technical nature as well as the policy purpose of an action or activity. Multi-purpose actions, activities and expenditure that address several CEPA classes should be divided into these classes. Classification under the heading 'indivisible expenditure and activities' should only be made as a last resort.

Classification of individual items cannot be based solely on the technical nature of the items. For example, the purchase of double-glazed windows in warm countries will typically relate to issues of noise protection, whereas in colder countries they will be a standard energy saving device. Measures to reduce fertiliser use may primarily fall under CEPA 4 (protection of groundwater), CEPA 2 (prevention of runoff to protect surface waters) or CEPA 6 (prevention of nutrient enrichment to protect biotopes) depending on the main purpose of measures and policies. Measures against forest fires will be unimportant or purely serve economic purposes (and thus fall outside of CEPA) in some countries whereas in others the main aspect of forest fires will be an environmental one related to landscape and habitat preservation rather than protection of a natural resource.

Classification of transversal activities and expenditure

Transversal activities are R&D, administration and management as well as education, training and information. All R&D should be allocated to CEPA 8. Administration and management as well as education, training and information should, to the extent possible, be allocated to the 'Other' positions in CEPA 1-7. Ideally, transversal activities would be identified separately, as well as by CEPA class but primary data sources relating to CEPA 1-7 often do not allow this. R&D, education and training or administration and management are often either not separable from other actions relating to another class (administration or training as part of waste management, for example) or cannot be split by class (R&D data collected by industry expenditure surveys, for example). If such identification problems are considered substantial, data on R&D, administration and management and on education, training and information should not be published at the 2-digit level.

The classification of R&D in CEPA 8 follows the NABS 1993 (the Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets). CEPA 8 should be used when primary data following the NABS are available from R&D statistics. When this is not the case, other data sources employed (e.g., budget analysis) may not allow a systematic separation of R&D from other actions and activities. R&D may then be included under several CEPA classes.

The above considerations will apply differently across countries, depending on the availability and level of detail of primary data sources. Often, differences in the main data sources will result in different practices for coding transversal activities and expenditure, and international comparability for these may be limited.

1 PROTECTION OF AMBIENT AIR AND CLIMATE

Protection of ambient air and climate comprises measures and activities aimed at the reduction of emissions into the ambient air or ambient concentrations of air pollutants in addition to measures and activities aimed at the control of emissions of greenhouse gases and gases that adversely affect the stratospheric ozone layer.

Excluded are measures undertaken for cost saving reasons (e.g. energy saving).

1.1 Prevention of pollution through in-process modifications

Activities and measures aimed at the elimination or reduction of the generation of air pollutants through in-process modifications related to:

- Cleaner and more efficient production processes and other technologies (cleaner technologies),

- The consumption or use of 'cleaner' (adapted) products.

Cleaner technologies

Prevention activities consist of replacing an existing production process by a new process designed to reduce the generation of air pollutants during production, storage or transportation, e.g. fuel combustion improvement, recovery of solvents, prevention of spills and leaks through improving air-tightness of equipment, reservoirs and vehicles, etc.

Use of cleaner products

Prevention activities consist of modifying facilities so as to provide for the substitution of raw materials, energy, catalysts and other inputs by non- (or less) polluting products, or of treating raw materials prior to their use in order to make them less polluting, e.g. desulphuration of fuel. Expenditure under this position also includes the extra-cost of the use of cleaner products (low sulphur fuels, unleaded petrol, clean vehicles, etc.).

1.2 Treatment of exhaust gases and ventilation air

Activities involving the installation, maintenance and operation of end-of-pipe equipment for the removal and reduction of emissions of particulate matter or other air-polluting substances either from the combustion of fuels or from processes: filters, dedusting equipment, catalytic converters, post-combustion and other techniques. Also included are activities aimed at increasing the dispersion of gases so as to reduce concentrations of air pollutants.

Exhaust gases are emissions into the air, usually through exhaust pipes, stacks or chimneys, due to the combustion of fossil fuels. Ventilation air is exhausts of air conditioning systems of industrial establishments.

1.3 Measurement, control, laboratories and the like

Activities aimed at monitoring the concentrations of pollutants in exhaust gases, the quality of air, etc. Included are measurement services of exhaust gases from vehicles and heating systems and the monitoring related to the ozone layer, greenhouse gases and climate change. Weather stations are excluded.

1.4 Other activities

All other activities and measures aimed at the protection of ambient air and climate. Includes regulation, administration, management, training, information and education activities specific to CEPA 1, when they can be separated from other activities related to the same class and from similar activities related to other environmental protection classes.

2 WASTEWATER MANAGEMENT

Wastewater management comprises activities and measures aimed at the prevention of pollution of surface water through the reduction of the release of wastewater into inland surface water and seawater. It includes the collection and treatment of wastewater including monitoring and regulation activities. Septic tanks are also included.

Excluded are actions and activities aimed at the protection of groundwater from pollutant infiltration and the cleaning up of water bodies after pollution (see CEPA 4).

Wastewater is defined as water that is of no further immediate value for the purpose for which it was used or in the pursuit of which it was produced because of quality, quantity, or time of its occurrence.

2.1 Prevention of pollution through in-process modifications

Activities and measures aimed at reducing the generation of surface water pollutants and wastewater through in-process modifications related to:

- Cleaner and more efficient production processes and other technologies (cleaner technologies),

- The consumption or use of 'cleaner' (adapted) products.

Cleaner technologies

Prevention activities consist of replacing an existing production process by a new process designed to bring about a reduction of water pollutants or wastewater generated during production. It includes separation of networks, treatment and re-use of water used in the production process, etc.

Use of cleaner products

Prevention activities consist of modifying an existing production process so as to provide for the substitution of raw materials, catalysts and other inputs by non- (or less) water polluting products.

2.2 Sewerage networks

Activities aimed at the operation of sewerage networks, i.e. the collection and transport of wastewater from one or several users, and also rainwater, by means of sewerage

networks, collectors, tanks and other means of transport (sewage vehicles, etc.), including maintenance and repair.

Sewerage networks are the systems of collectors, pipelines, conduits and pumps to evacuate any wastewater (rainwater, domestic and other wastewater) from the points of generation to either a sewage treatment plant or to a point where wastewater is discharged into surface water.

2.3 Wastewater treatment

Wastewater treatment designates any process to render wastewater fit to meet applicable environmental standards or other quality norms. Three broad types of treatment (mechanical, biological, and advanced treatment) are specified below. Alternative definitions of types of treatment may be used, e.g. based on removal rates for BOD.

Mechanical treatment of wastewater designates processes of a physical and mechanical nature which result in decanted effluent and separate sludge. Mechanical processes are also used in combination and/or in conjunction with biological and advanced unit operations. Mechanical treatment is understood to include at least such processes as sedimentation, flotation, etc. The activity is aimed at separating materials in suspension by the use of screens (large solids) or through sedimentation eventually assisted by chemicals or flotation (elimination of sand, oil, part of the sludge, etc.).

Equipment includes screens for large solids, biological plants, equipment for filtration, flocculation, sedimentation; separation of oils and hydrocarbons; separation using inertia or gravity, including hydraulic and centrifugal cyclones, diaphragm floats, etc.

Biological treatment of wastewater designates processes which employ aerobic or anaerobic micro-organisms and result in decanted effluent and separate sludge containing microbial mass together with pollutants. Biological treatment processes are also used in combination and/or in conjunction with mechanical and advanced unit operations. This activity is designed to eliminate pollution from oxidisable materials through the use of bacteria: activated sludge technique or anaerobic treatment for specific concentrated wastewater. Biodegradable materials are treated with the addition of bacteria-enriched sludge in open or closed tanks.

Treatment of wastewater by advanced technologies designates processes capable of reducing specific constituents in wastewater not normally achieved by other treatment options. Covers all unit operations which are not considered to be mechanical or biological. Includes, for example, chemical coagulation, flocculation and precipitation; break-point chlorinating; stripping; mixed media filtration; micro-screening; selective ion exchange; activated carbon absorption; reverse osmosis; ultra-filtration; elector flotation. Advanced treatment processes may be used in combination and/or in conjunction with mechanical and biological unit operations. This activity is aimed at eliminating oxidisable non-biodegradable matter at a higher level, and also metals, nitrate, phosphorous, etc. by using powerful biological or physical and chemical action. Special equipment is required for each depollution.

Septic tanks are settling tanks through which wastewater flows and the suspended matter is decanted as sludge. Organic matter (in the water and in the sludge) is partly decomposed by anaerobic bacteria and other micro-organisms. Maintenance services of septic tanks (emptying etc.) and other products for septic tanks (biological activators, etc.) are included.

2.4 Treatment of cooling water

Treatment of cooling water designates "processes which are used to treat cooling water to meet applicable environmental standards before releasing it into the environment. Cooling

water is used to remove heat." Means, methods, facilities used may be: air cooling (extra cost compared with water cooling), cooling towers (to the extent they are required to reduce pollution, as distinct from technical needs), cooling circuits for processing water from work sites and for condensing released vapour, equipment for enhancing the dispersion of cooling water on release, closed cooling circuits (extra cost), circuits for use of cooling water for heating purposes (extra cost).

2.5 Measurement, control, laboratories and the like

Activities aimed at monitoring and controlling the concentration of pollutants in wastewater and the quality of inland surface water and marine water at the place wastewater is discharged (analysis and measurement of pollutants, etc.).

2.6 Other activities

All other activities and measures aimed at wastewater management. Includes regulation, administration, management, training, information and education activities specific to CEPA 2, when they can be separated from other activities related to the same class and similar activities related to other environmental protection classes.

3 WASTE MANAGEMENT

Waste management refers to activities and measures aimed at the prevention of the generation of waste and the reduction of its harmful effect on the environment. Includes the collection and treatment of waste, including monitoring and regulation activities. It also includes recycling and composting, the collection and treatment of low level radioactive waste, street cleaning and the collection of public litter.

Waste is materials that are not prime products (that is, products made for the market) for which the generator has no further use for its own purposes of production, transformation, or consumption, and which it wants to dispose of. Waste may be generated during the extraction of raw materials, during the processing of raw materials to intermediate and final products, during the consumption of final products, and during any other human activity. Residuals recycled or reused at the place of generation are excluded. Also excluded are waste materials that are directly discharged into ambient water or air.

Hazardous waste is waste that due to its toxic, infectious, radioactive, flammable or other character defined by the legislator poses a substantial actual or potential hazard to human health or living organisms. For the purposes of this definition, "hazardous waste" comprises for each country all those materials and products which are considered to be hazardous in accordance with that country's practices. Low level radioactive waste is included, whereas other radioactive waste is excluded (see CEPA 7).

Low level radioactive waste is waste that, because of its low radionucleide content, does not require shielding during normal handling and transportation.

Treatment and disposal of waste

Treatment of waste refers to any process designed to change the physical, chemical, or biological character or composition of any waste to neutralise it, render it non-hazardous, safer for transport, amenable for recovery or storage, or to reduce it in volume. A particular waste may undergo more than one treatment process.

Composting and recycling activities for the purpose of environmental protection are included. Often composting is a waste treatment method and the resulting compost is

provided free of charge or at a very low price. The manufacture of compost classified in division 24 of ISIC/NACE (Manufacture of fertilisers and nitrogen compounds) is excluded.

Division 37 of ISIC/NACE defines recycling as "the processing of waste, scraps whether or not used, into a form feasible to be transformed in new raw materials. This is typified in that, in terms of commodities, both input and output consist of waste and scrap, the input being sorted or unsorted but always unfit for further direct use in an industrial process whereas the output is made fit for further processing and is to be considered then as an intermediate item. A process is required, either mechanical or chemical". The main purpose of activities classified in division 37 of ISIC/NACE is the manufacture of secondary raw materials but there may be important secondary waste management activities.

Compost and secondary raw materials (and also products made of secondary raw materials) are not considered environmental protection products. Their use is excluded.

Disposal of waste is the final deposition of waste on or underground in controlled or uncontrolled fashion, in accordance with the sanitary, environmental or security requirements.

3.1 Prevention of pollution through in-process modifications

Activities and measures aimed at eliminating or reducing the generation of solid waste through in-process modifications relating to:

- Cleaner and more efficient production processes and other technologies (cleaner technologies),

- The consumption or use of ‘cleaner’ (adapted) products.

Cleaner technologies

Prevention activities consist of replacing an existing production process by a new process designed to reduce the toxicity or volume of waste produced during the production process, including by separation and re-processing.

Use of cleaner products

Protection activities consist of modifying or adapting the production process or facilities so as to provide for the substitution of raw materials, catalysts and other intermediate inputs by new, "adapted" inputs the use of which produces less waste or less hazardous waste.

3.2 Collection and transport

Collection and transport of waste is defined as the collection of waste, either by municipal services or similar institutions or by public or private corporations, and their transport to the place of treatment or disposal. It includes the separate collection and transport of waste fractions so as to facilitate recycling and the collection and transport of hazardous waste. Street cleaning is included for the part referring to public litter and collection of garbage from the streets. Excluded are winter services.

3.3 Treatment and disposal of hazardous waste

Treatment of hazardous waste comprises the processes of physical/chemical treatment, thermal treatment, biological treatment, conditioning of wastes, and any other relevant treatment method. Disposal of hazardous waste comprises landfill, containment, underground disposal, dumping at sea, and any other relevant disposal method.

Thermal treatment of hazardous waste refers to any process for the high temperature oxidation of gaseous, liquid, or solid hazardous waste, converting it into gases and incombustible solid residues. The flue gases are released into the atmosphere (with or without recovery of heat and with or without cleaning) and any slag or ash produced is deposited in the landfill. The main technologies used in the incineration of hazardous waste are the rotary kiln, liquid injection, incinerator grates, multiple chamber incinerators, and fluidised bed incinerators. Residues from hazardous waste incineration may themselves be regarded as hazardous waste. The resulting thermal energy may or may not be used for the production of steam, hot water, or electrical energy.

Landfill is an activity concerning final disposal of hazardous waste in or on land in a controlled way, which meets specific geological and technical criteria.

Other treatment and disposal of hazardous waste may consist of chemical and physical treatment, containment and underground disposal.

Chemical treatment methods are used both to effect the complete breakdown of hazardous waste into non-toxic gases and, more usually, to modify the chemical properties of the waste, e.g. to reduce water solubility or to neutralise acidity or alkalinity.

Physical treatment of hazardous waste: includes various methods of phase separation and solidification whereby the hazardous waste is fixed in an inert, impervious matrix. Phase separation encompasses the widely used techniques of lagooning, sludge drying in beds, and prolonged storage in tanks, air flotation and various filtration and centrifugation techniques, adsorption/desorption, vacuum, extractive and azeotropic distillation. Solidification or fixation processes, which convert the waste into an insoluble, rock-hard material, are generally used as pre-treatment prior to landfill disposal. These techniques employ blending the waste with various reactants or organic polymerisation reactions or the mixing of the waste with organic binders.

Containment is the retention of hazardous material in such a way that it is effectively prevented from dispersing into the environment, or is released only at an acceptable level. Containment may occur in specially built containment spaces.

Underground disposal includes temporary storage or final disposal of hazardous wastes underground that meet specific geological and technical criteria.

3.4 Treatment and disposal of non-hazardous waste

Treatment of non-hazardous waste comprises the processes of physical/chemical treatment, incineration of waste, biological treatment, and any other treatment method (composting, recycling, etc.).

Incineration is the thermal treatment of waste during which chemically fixed energy of combusted matters is transformed into thermal energy. Combustible compounds are transformed into combustion gases leaving the system as flue gases. Incombustible inorganic matters remain in the form of slag and fly ash.

Disposal of non-hazardous waste comprises landfill, dumping at sea, and any other disposal method.

3.5 Measurement, control, laboratories and the like

Activities and measures aimed at controlling and measuring the generation and storage of waste, their toxicity, etc.

3.6 Other activities

All other activities and measures aimed at waste management. It includes administration, management, training, information and education activities specific to the class, when they can be separated from other activities relating to the same class and from similar activities relating to other environmental protection classes.

4 PROTECTION AND REMEDIATION OF SOIL, GROUNDWATER AND SURFACE WATER

Protection and remediation of soil, groundwater and surface water refers to measures and activities aimed at the prevention of pollutant infiltration, cleaning up of soils and water bodies and the protection of soil from erosion and other physical degradation and also from salinisation. Monitoring, control of soil and groundwater pollution are included.

Excluded are wastewater management activities (see CEPA 2), and also activities aimed at the protection of biodiversity and landscape (see CEPA 6).

4.1 Prevention of pollutant infiltration

Activities and measures aimed at the reduction or elimination of polluting substances that may be applied to soil, percolate into groundwater or run-off to surface water. Included are activities related to sealing of soils of industrial plants, installation of catchment for pollutant run-offs and leaks, strengthening of storage facilities and transportation of pollutant products.

4.2 Cleaning up of soil and water bodies

Processes to reduce the quantity of polluting materials in soil and water bodies either in situ or in appropriate installations. It includes soil decontamination at former industrial sites, landfills and other black spots, dredging of pollutants from water bodies (rivers, lakes, estuaries, etc.), the decontamination and cleaning up of surface water following accidental pollution e.g. through collection of pollutants or through application of chemicals, and also the cleaning up of oil spills on land, inland surface waters and seas – including coastal areas. Excludes the liming of lakes and artificial oxygenation of water bodies (see CEPA 6). Excludes civil protection services.

Activities may consist of: measures for separating, containing and recovering deposits, extraction of buried casks and containers, decanting and re-storage, installation of off-gas and liquid effluent drainage networks, soil washing by means of degasification, pumping of pollutants, removal and treatment of polluted soil, biotechnological methods capable of intervening without affecting the site (use of enzymes, bacteria, etc.), physical chemistry techniques such as pervaporation and extraction using supercritical fluids, injection of neutral gases or bases to stifle internal fermentation, etc.

4.3 Protection of soil from erosion and other physical degradation

Activities and measures aimed at the protection of soil from erosion and other physical degradation (compacting, encrusting, etc.). They may consist of programs intended to restore the protective vegetal cover of soils, construction of anti-erosion walls, etc. Measures may also consist in subsidising agricultural and grazing practices less harmful for soils and water bodies.

Excluded are activities carried out for economic reasons (e.g. agricultural production or protection of settlements against natural hazards such as landslides).

4.4 Prevention and remediation of soil salinity

Activities and measures aimed at the prevention and remediation of soil salinity. Concrete actions will depend on climatic, geological and other country-specific factors. Included are actions to increase groundwater tables, e.g. through increased freshwater infiltration to avoid infiltration of seawater into groundwater bodies, lowering of groundwater tables (when groundwater contains high levels of salts) through long-term re-vegetation programmes, changes in irrigation practices, etc.

Excluded are measures that respond to economic purposes (agricultural production, reclamation of land from the sea, etc.).

4.5 Measurement, control, laboratories and the like

All activities and measures aimed at controlling and measuring the quality and pollution of soils, groundwater and surface water, measuring the extent of soil erosion and salinisation etc. Includes the operation of monitoring systems, inventories of "black spots", maps and databases of groundwater and surface water quality, of soil pollution, erosion and salinity, etc.

4.6 Other activities

All other activities and measures aimed at the protection and remediation of soil, groundwater and surface water. It includes administration, management, training, information and education activities specific to the class, when they can be separated from other activities related to the same class and from similar activities related to other environmental protection classes.

5 NOISE AND VIBRATION ABATEMENT (EXCLUDING WORKPLACE PROTECTION)

Noise and vibration abatement refers to measures and activities aimed at the control, reduction and abatement of industrial and transport noise and vibration. Activities for the abatement of neighbourhood noise (soundproofing of dancing halls, etc.) in addition to activities for the abatement of noise in places frequented by the public (swimming pools, etc.), in schools, etc., are included.

Excluded is the abatement of noise and vibration for purposes of protection at the workplace.

5.1 Preventive in-process modifications at the source

Activities and measures aimed at the reduction of noise and vibration from industrial equipment, vehicle motors, aircraft and ships engines, exhaust systems and brakes, or noise level due to tyre/road or wheel/rail surface contact. Includes the adaptation of equipment, vehicles (buses, trucks, or train and power units in the case of rail transport, aircraft and ships) in order to make them less noisy: soundproofing of hoods, brakes, exhaust systems, etc. Includes also plant modifications, specially conceived foundations to absorb vibrations, extra cost for regrouping of buildings and/or of facilities in the interest of noise abatement, special facilities in building construction or reconstruction, equipment and machines conceived or constructed for low noise or vibrations, low noise level flares and burners, etc.

Other preventive activities consist of noise abatement through the modification of surfaces. As noise emissions from motors, engines, exhaust systems and brakes are lowered, those from other sources become more important and in particular noise that

originates from the contact between tyres and road surfaces. Activities consist of substituting concrete for silent asphalt, multi-layered surfaces, etc.

5.2 Construction of anti noise/vibration facilities

Activities and measures aimed at the installation and management of anti-noise facilities. These may be screens, embankments or hedges. They may consist of covering sections of urban motorways or railroads. As regards industrial and surrounding noise they also consist of add-on facilities, covering and soundproofing of machines and piping, fuel regulation systems and sound absorption, noise screens, barriers, soundproofing of buildings, noise protective windows, etc., in order to limit noise perception.

5.3 Measurement, control, laboratories and the like

Activities and measures aimed at controlling the level of noise and vibration: installation and operation of stationary measurement and monitoring sites or mobile equipment in urban areas, observation networks, etc.

5.4 Other activities

All other activities and measures aimed at noise and vibration abatement. It includes administration, management, training, information and education activities specific to the class, when they can be separated from other activities related to the same class and from similar activities related to other classes. It also includes, when separable, traffic management with noise abatement purposes (for example, lowering of speed limits, improvement of traffic flows), introduction of time and geographical restrictions for noisy vehicles, traffic detours at a distance from residential areas, creation of pedestrian areas, creation of construction-free buffer zones, restructuring of modal split (improvement of public transportation, use of bicycles). This covers a potentially large set of administrative measures which raise serious identification problems given their incorporation in integrated programmes of traffic control and urban planning and the difficulty of separating that part of measures and expenditure that, in these programmes, concern noise and vibration abatement from expenditure related to air pollution control, improvement of the living environment or traffic safety.

In addition to regulation, other measures may consist of: financial incentives for the production and use of low-noise vehicles, labelling or information programmes for consumers so as to encourage the use of low-noise vehicles and the adoption of quiet driving behaviour.

6 PROTECTION OF BIODIVERSITY AND LANDSCAPES

Protection of biodiversity and landscape refers to measures and activities aimed at the protection and rehabilitation of fauna and flora species, ecosystems and habitats in addition to the protection and rehabilitation of natural and semi-natural landscapes. The separation between ‘biodiversity’ and ‘landscape’ protection may not always be practical. For example, maintaining or establishing certain landscape types, biotopes, eco-zones and related issues (hedgerows, lines of trees to re-establish ‘natural corridors’) have a clear link to biodiversity preservation.

Excluded is the protection and rehabilitation of historic monuments or predominantly built-up landscapes, the control of weeds for agricultural purposes and also the protection of forests against forests fire when this predominantly responds to economic reasons. The establishment and maintenance of green spaces along roads and recreational structures (e.g. golf courses, other sports facilities) are also excluded.

Actions and expenditure related to urban parks and gardens would not normally be included but may relate in some cases to biodiversity – in such cases the activities and expenditure should be included.

6.1 Protection and rehabilitation of species and habitats

Activities and measures aimed at the conservation, reintroduction or recovery of fauna and flora species, in addition to the restoring, rehabilitation and reshaping of damaged habitats for the purpose of strengthening their natural functions. Includes conserving the genetic heritage, re-colonising destroyed ecosystems, placing bans on exploitation, trade, etc. of specific animal and plant species, for protection purposes. Also includes censuses, inventories, databases, creation of gene reserves or banks, improvement of linear infrastructures (e.g., underground passages or bridges for animals at highways or railways, etc.), feeding of the young, management of special natural reserves (botany conservation areas, etc.). Activities may also include the control of fauna and flora to maintain natural balances, including re-introduction of predator species and control of exotic fauna and flora that pose a threat to native fauna, flora and habitats.

Main activities are the management and development of protected areas, whatever the denomination they receive, i.e. areas protected from any economic exploitation or in which the latter is subject to restrictive regulations whose explicit goal is the conservation and protection of habitats. Also included are activities for the restoration of water bodies as aquatic habitats: artificial oxygenation and lime-neutralisation actions. When they have a clear protection of biodiversity purpose, measures and activities related to urban parks and gardens are to be included. Purchase of land for protection of species and habitats purpose is included.

6.2 Protection of natural and semi-natural landscapes

Activities and measures aimed at the protection of natural and semi-natural landscapes to maintain and increase their aesthetic value and their role in biodiversity preservation. Included are the preservation of legally protected natural objects, expenditures incurred for the rehabilitation of abandoned mining and quarrying sites, renaturalisation of river banks, burying of electric lines, maintenance of landscapes that are the result of traditional agricultural practices threatened by prevailing economic conditions, etc. For biodiversity and landscape protection related to agriculture, the identification of specific state aid programmes to farmers may be the only data source available. Protection of forests against forest fires for landscape protection purpose is included.

Excluded are measures taken in order to protect historic monuments, measures to increase aesthetic values for economic purposes (e.g., re-landscaping to increase the value of real estates) and also protection of predominantly built-up landscapes.

6.3 Measurement, control, laboratories and the like

Measurement, monitoring, analysis activities which are not classified under the preceding items. In principle, inventories of fauna and flora are not covered since they are classified under protection of species.

6.4 Other activities

All other activities and measures aimed at the protection of biodiversity and landscape. It includes administration, training, information and education activities specific to the domain, when they can be separated from other activities related to the same domain and similar activities related to other classes.

7 PROTECTION AGAINST RADIATION (EXCLUDING EXTERNAL SAFETY)

Protection against radiation refers to activities and measures aimed at the reduction or elimination of the negative consequences of radiation emitted from any source. Included is the handling, transportation and treatment of high level radioactive waste, i.e. waste that, because of its high radionuclide content, requires shielding during normal handling and transportation.

Excluded are activities and measures related to the prevention of technological hazards (e.g. external safety of nuclear power plants), in addition to protection measures taken at workplaces. Also excluded are activities relating to collection and treatment of low-level radioactive waste (see CEPA 3).

Definition of radioactive waste

Any material that contains or is contaminated with radionuclides at concentrations or radioactivity levels greater than the "exempt quantities" established by the competent authorities, and for which no use is foreseen. Radioactive wastes are produced at nuclear power plants and at associated nuclear fuel cycle facilities and also through other uses of radioactive material, for example, the use of radionuclides in hospitals and research establishments. Other important wastes are those from mining and milling of uranium and from the reprocessing of spent fuel.

7.1 Protection of ambient media

Protection of ambient media groups together activities and measures undertaken in order to protect ambient media from radiation. It may consist of protection measures such as screening, creation of buffer zones, etc.

7.2 Transport and treatment of high level radioactive waste

Any process designed for the transport, conditioning, containment or underground disposal of high level radioactive waste.

Collection and transport of high level radioactive waste consists of the collection of high level radioactive waste, generally by specialised firms and their transport to the place of treatment, conditioning storage and disposal.

Conditioning of high level radioactive waste consists of activities that transform high level radioactive waste into a proper and fit condition for transport and/or storage and/or disposal. Conditioning may occur as part of ISIC/NACE 23 (processing of nuclear fuels) activities.

Containment of high level radioactive waste designates the retention of radioactive waste in such a way that it is effectively prevented from dispersing into the environment, or is released only at an acceptable level. Containment may occur in specially built containment spaces.

Underground disposal of high level radioactive waste is the temporary storage or final disposal of high level radioactive waste in underground sites that meet specific geological and technical criteria.

7.3 Measurement, control, laboratories and the like

Activities aimed at measuring, controlling and monitoring ambient radioactivity and radioactivity due to high level radioactive waste by means of specific equipment, instruments and installations.

7.4 Other activities

All other activities and measures aimed at the protection of ambient media against radiation and transport and treatment of high level radioactive waste. It includes administration, training, information and education activities specific to the domain, when they can be separated from other activities relating to the same class and similar activities relating to other environmental protection classes.

8 RESEARCH AND DEVELOPMENT

Research and development (R&D) comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge and the use of this knowledge to devise new applications (see Frascati manual, OECD 1994) in the field of environmental protection.

The class regroups all R&D activities and expenditure oriented towards environmental protection: identification and analysis of sources of pollution, mechanisms of dispersion of pollutants in the environment in addition to their effects on human beings, the species and the biosphere. This heading covers R&D for the prevention and elimination of all forms of pollution, and also R&D oriented towards equipment and instruments of pollution measurement and analysis. When separable, all R&D activities have to be classified under this position even when referring to a specific class.

Environmental R&D is further classified in accordance with the 1993 NABS (Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets, Eurostat 1994).

Excluded are R&D activities relating to the management of natural resources.

9 OTHER ENVIRONMENTAL PROTECTION ACTIVITIES

Other environmental protection activities refers to all environmental protection activities which take the form of general environmental administration and management activities or training or teaching activities specifically oriented towards environmental protection or which consist of public information, when they are not classified elsewhere in CEPA. It also includes activities leading to indivisible expenditure, in addition to activities not elsewhere classified.

9.1 General environmental administration and management

General administration of the environment designates any identifiable activity that is directed at the general support of decisions taken in the context of environmental protection activities, whether by governmental or by non-governmental units.

General administration of the environment, regulation and the like

Any identifiable activity within General Government and NPISH units that is directed towards the regulation or administration of the environment and the support of decisions taken in the context of environmental protection activities. When possible such activities should be allocated to other classes. If this is impossible, they should be included under this position of the classification.

Environmental management

Any identifiable activity of corporations that is directed at the general support of decisions taken in the context of environmental protection activities. It includes the preparation of

declarations or requests for permission, internal environmental management, environmental certification processes (ISO 14000, EMAS), and also the recourse to environmental consultancy services. Activities of units specialising in environmental consultancy, supervision and analysis are included. When possible such activities should be allocated to other CEPA classes.

9.2 Education, training and information

Activities that aim at providing general environmental education or training and disseminating environmental information. Included are high school programmes, university degrees or special courses specifically aimed at training for environmental protection. Activities such as the production of environmental reports, environmental communication, etc. are also included.

9.3 Activities leading to indivisible expenditure

Environmental protection activities that lead to indivisible expenditure, i.e. which cannot be allocated to any other CEPA class. International financial aid may be a case in point as it may be difficult for the donor countries to attribute international aid to individual classes. If international aid is important in volume and/or of specific political interest, a separate 2-digit heading under CEPA 9 could be adequate for national purposes.

9.4 Activities not elsewhere classified

This position groups together all these environmental protection activities that cannot be classified under other positions of the classification.

Annex 2: JQ and EPEA tables

JQ explanatory notes

2. GENERAL METHODOLOGICAL REMARKS

2.1 Definition of Environmental Protection (EP)

Environmental protection (EP) includes all purposeful activities directly aimed at the prevention, reduction and elimination of pollution or any other degradation of the environment resulting from production process or from the use of goods and services.

In this revised questionnaire, the scope of Environmental Protection is defined according to the Classification of Environmental Protection Activities (CEPA), which distinguishes nine different environmental domains. Environmental Protection includes activities related to Biodiversity and Landscape (Nature protection) and environmental Research and Development, contrary to the PAC concept used in earlier questionnaires. A more detailed description of the contents of each individual environmental domain can be found in section 5.

- Activities such as energy and material saving are only included to the extent that they mainly aim at environmental protection. An important example is recycling which is included only to the extent that it constitutes a substitute for waste management. (The specific treatment of NACE/ISIC 37 Recycling is outlined in 3.4 below.)
- Excluded are activities that, while beneficial to the environment, primarily satisfy technical needs or health and safety requirements.
- Excluded is also expenditure linked to mobilisation of natural resources (e.g., water supply).
- Excluded are calculated cost items such as depreciation (consumption of fixed capital) or the cost of capital as this questionnaire only records actual outlays.
- Excluded are payments of interest, fines and penalties for non-compliance with environmental regulations or compensations to third parties etc. as they are not directly linked with an environmental protection activity.

2.2 Framework and general principles

An overview of the framework used in this questionnaire is outlined in the table below. Environmental Protection Expenditure can be evaluated both according to the abater principle and the financing principle. The structure of this questionnaire is designed to allow for evaluation of both principles for each sector and industry. This distinction makes it possible to aggregate different sectors and industries without double counting.

Expenditure according to the abater principle (EXP I), includes all expenditure that the sector has for measures they themselves execute. Any economic benefits directly linked with the environmental protection activities (Receipts from by-products) are deducted in order to calculate the net amount of money spent by the sector for their own activities.

The financing principle (EXP II) measures how much money a particular sector (directly) contributes to overall environmental protection activities, wherever they are executed. This means that the part of EXP I that was directly financed by others (through subsidies or fees received) should be deducted, while the part of EXP I in other sectors that this sector finances directly (through subsidies or fees paid) should be added.

Questionnaire framework

	PUBLIC SECTOR (TABLE 1)	BUSINESS SECTOR (TABLE 2)	HOUSEHOLDS (TABLE 3)	SPECIALISED PRODUCERS (TABLE 4)	TOTAL ECONOMY
	A Investment expenditure -- B Internal current expenditure C Receipts from by-products	A Investment expenditure *Of which end-of-pipe* B Internal current expenditure C Receipts from by-products	-- -- B (connected and adapted products) --	A Investment expenditure -- B Internal current expenditure C Receipts from by-products	Sum of tables 1, 2 and 4 -- Sum of tables 1-4 Sum of tables 1, 2 and 4
Abater principle	Expenditure I (A+B-C)	Expenditure I (A+B-C)	Expenditure I (B)	Expenditure I (A+B-C)	Sum of tables 1-4
	D Subsidies/Transfers (paid) E Fees/Purchases (paid for EP services) F Revenues (from EP services)	D Subsidies/Transfers (received) E Fees/Purchases (paid for EP services) *Of which paid to Public Sector* --	D Subsidies/Transfers (received) E Fees/Purchases (paid for EP services) *Of which paid to Public Sector* --	D Subsidies/Transfers (received) E Fees/Purchases (paid for EP services) *Of which paid to Public Sector* F Revenues (from EP services)	zero* Sum of tables 1-4 *(Note: total fees/purchases should equal total revenues)* * Sum of tables 1 and 4
Financing principle	Expenditure II (EXP I +D+E-F)	Expenditure II (EXP I -D+E)	Expenditure II (EXP I -D+E)	Expenditure II (EXP I -D+E-F)	Sum of tables 1-4 (Equal to EXP I) *

* Note the equilibrium will not hold when e.g. transfers are received from or are given to the rest of the world or in the case of EP services imported/exported or because of reporting of VAT, see below.

The framework is based on double entry bookkeeping, where each activity and expenditure item has an abater (producer) and a financing side. All financing flows should be recorded twice, both at the paying and the receiving sector (as subsidies given and received, as purchases made and revenues received etc.).

This means that much expenditure by specialised producers is financed by the users of their services, mainly business sector and households. This will be recorded as Revenues for the Specialised producers (Table 4), and fees/purchases in Business and Households (Tables 2 and 3).

Sub-contracting

Sometimes the Public sector is responsible for waste collection, collects the waste fees, but sub-contracts (and pays for) the execution to specialised enterprises (which can be both privately or publicly owned). In the case of complete outsourcing:

- The **public sector** has no investments or internal current expenditure. The collected fees would be recorded as revenues and the payments to specialised producers would be recorded under Fees/Purchases. When these financial flows match, this procedure will not affect the size of public sector EXP1 and EXP2.
- The **specialised producers** account for all investments and internal current expenditure. The payments from the public sector are recorded as revenues.
- All payments from households or companies for these activities are recorded as Fees/Purchases.

Abater expenditure that is not financed directly through the users, or through payments of earmarked environmental taxes, is considered to be financed by the abaters themselves e.g.:

- General administration in the public sector, financed through the general budget, is considered as being financed by the Public sector (Final consumption)
- Investments in industry and e.g. the expenditure for own personnel, which is not financed directly through subsidies, are considered as part of industry own financing (ancillary activities)

For the total economy, subsidies given should equal subsidies received, and purchases should equal revenues. Total economy EXP I should equal EXP II, only the sector distribution will be different. Households will typically have a small share of EXP I but a much higher share of EXP II, while for the Specialised producers the opposite pattern occurs.

A separate table **Total Economy** has been included which is automatically linked with the previous tables. This is a tool for data consolidation and should not be filled in. However, comments should be provided when the sums in this table considerably diverge from what would be expected conceptually. It should be noted that the simplified questionnaire framework itself could generate some differences (e.g. because of interaction with the rest of the world, or the recording of VAT). However, experience shows that these differences should be of minor importance in most countries.

Rest of the World

In principle, a sector 'Rest of the World' would have to be introduced in the framework to take account of EXP I that is funded from abroad, environmental aid given to other countries, or EP services imported and exported. This has not been done in order to keep the framework simple and because for many countries such transactions are very small compared to other types of expenditure. However, it should be noted that:

- Public sector environmental aid to the rest of the world would be recorded as part of the subsidies/transfers paid, and thus constitutes part of EXP II. Total subsidies/transfers in the economy would then be positive, and total economy EXP II would be larger than EXP I.
- The country that receives money (e.g. from the EU) should record it as Subsidies/transfers received. In this case Total economy EXP II would be smaller than EXP I.

- For a country with a (net) export of EP services EXP I would be larger than EXP II.

Recording of VAT

The price concepts used could differ across primary data sources. When different data sources are available for purchases and revenues, differences in the recording of VAT may lead to discrepancies between EXP 1 and EXP 2. Environmental protection expenditure should be recorded including non-deductible VAT i.e.:

- Payments by Households will include VAT.
- Payments by private companies will be net of VAT
- Revenues from selling environmental services should be recorded net of VAT.

When basic data are not as detailed as the breakdowns requires, the more aggregate data should be reported accompanied by a note specifying the coverage. When important, it might be necessary to make adjustments to avoid considerable double counting e.g.

- Only when the fees/purchases (of EP services) cannot be separated from internal expenditure, total current expenditure should be reported under variable B. 'Internal current expenditure'. This would lead to an overestimation of EXP I and EXP II. If possible, an estimate of the importance of fees/payments should be made, or the expenditure of the specialised producers could be reduced accordingly (e.g. ignoring the internal expenditure of specialised producers).

- There is a risk of considerable double counting when the public sector sub-contracts activities to specialised producers, and when payments to the sub-contractor are included in EXP I in Table 1 (e.g. as part of total current expenditure reported under Internal current expenditure). In this case it might be considered not to include all internal current expenditure of the specialised producer in Table 4.

3. SECTORS

The questionnaire consists of four tables for the main sectors of the economy, and additional sub-tables for the business sector and for specialised producers.

3.1 Public sector (Table 1)

The public sector includes central, regional and local governments, authorities, communities and government agencies (mainly NACE 75). Data reported should be net of any transfers between these government bodies.

It is important to make a clear distinction between Public sector and Specialised producers. All NACE/ISIC 90 activities should be entered into the table for Specialised producers (Table 4). This includes the Public sector related parts such as publicly owned enterprises and waste and wastewater departments in large municipalities (which can be separately identified and are thus recorded under NACE/ISIC 90 in the business register). User fees finance a substantial part of the expenditures of both these categories.

Only when the existing data sources make this kind of separation impossible, the waste and wastewater departments could be recorded under Public sector (Table 1), along with a footnote specifying the coverage.

3.2 Business sector (Table 2, Table 2A-E)

Total business sector (Table 2) includes all activities in NACE/ISIC 01-99, excluding public sector (mainly NACE 75) and the activities of specialised producers (mainly in ISIC/NACE 90). Total business sector is divided into five sub-categories (Tables 2A-E). There is an additional table for the manufacturing industry with a more detailed industry breakdown (Table 2C Add). Please note that NACE 37 Recycling should not be reported as part of the Business sector, see 3.4 below.

The data supplied in Table 2 should be equal to the sum of the five sub-tables. Table 2E Other should cover NACE/ISIC 44-99 excluding public sector and specialised producers.

When the available data do not cover all parts of the business sector, or a detailed breakdown cannot be supplied, the coverage should be specified. This is important in particular for Tables 2 and 2E.

Please note

Abater expenditure (investments and internal current expenditure) should relate to measures taken to treat or prevent pollution from the operating activity of the company. Measures to treat pollution generated from the operating activity of other companies should not be included as part of the business sector: i.e. expenditure for secondary NACE 90 activities.

This means that expenditure for the industry water supply (NACE 41) e.g. should only relate to production of drinking water and not include expenditure for wastewater treatment plants, if any, which treat wastewater generated by other companies.

3.3 Households (Table 3)

Based on Member Countries' experience with the collection of data on private households, environmental protection expenditure according to the abater principle (EXP I) should include only purchases of associated and adapted products. There is no need to make a distinction between investments and current expenditure. Household purchases are viewed as current, in line with the national accounts, and the total sum should be entered directly into Expenditure I. Examples are:

- Purchase, operation and maintenance of air pollution control devices for motor vehicles e.g. extra costs for use of more environmentally friendly goods such as unleaded petrol, or service costs for proper adjustments of engines;
- Purchase of sewage treatment facilities such as septic tanks
- Purchase of goods used in connection with waste management such as bins, bags, composts etc.

Household expenditure according to the financing principle include all payments and fees for services purchased from municipalities and public or private specialised producers of environmental protection services. These include mainly:

- Payments for the collection and treatment of waste
- Payments for the collection and treatment of wastewater

3.4 Specialised producers of environmental services (Table 4)

Some enterprises (both privately and publicly owned) and separately identified departments of large municipalities have the production of environmental protection services as their main activity. These are mainly activities within NACE/ISIC 90 such as (NACE Rev 1.1):

- 90.01 Collection and treatment of sewage
- 90.02 Collection and treatment of solid waste
- 90.03 Sanitation, remediation and similar activities.

Specialised producers could also include environmental management activities provided by environmental consultants, the activities of e.g. volunteer environmental organisations or secondary environmental activities in e.g. NACE 37 Recycling, if such information is available. These should be entered in the domain "Other" along with a footnote describing the coverage. There are two alternative ways of reporting expenditure for secondary environmental activities:

- Expenditure e.g. in NACE/ISIC 37 Recycling could be included in total, but only if the sales value of the recovered materials is recorded as part of their Receipts from by-products. EXP I would then be equal to the secondary environmental activities in NACE/ISIC 37.
- If estimates of the size of the environmental part are directly available, these could be entered into the variable investments, internal current expenditure etc. The variable receipts from by-products would then not include any revenues from non-environmental activities.

Expenditure by enterprises for producing market environmental goods (environmental protection equipment, materials and other parts of the environment industry) should not be included in this questionnaire.

Expenditure recorded for the specialised producers (and their revenues) should be matched by fees/purchases in other sectors, as otherwise EXP I and EXP II will not balance. If this is not the case, a note should be added to the table explaining why the difference occurs.

Detailed information for the specialised producers might be available from production statistics (NACE 90). The economic variables of relevance for these producers differ from other sectors and industries.

- Their contribution to Environmental Protection according to the abater principle (EXP I) are total investments and total internal current expenditure (total cost of production excluding depreciation and payments for environmental protection to other Specialised producers), less any revenues from non-environmental activities (recorded as Receipts from by-products).
- Total revenues from selling the Environmental Protection services (their main activity) should be deducted from EXP I, and Payments for environmental protection to other specialised producers (e.g. from waste collector to landfill owner) should be added, in order to calculate this sector's contribution to Environmental Protection according to the financing principle (EXP II).

- The 'real' financing by specialised producers equals their investments (minus) depreciation (minus) profits, since the user payments should cover all production costs including depreciation and profits. EXP II in Table 4 could be negative if depreciation and profits are larger than investments in a particular year, e.g. in mature and capital-intensive activities such as e.g. Wastewater treatment.

The table below show how data for NACE 90 from a standard profit and loss account can be transformed into the different variables in Table 4. Please note that these data may not cover all units involved (private companies, publicly owned companies, municipal departments). The coverage should be specified.

Statistics NACE 90, NL 1999 *(Total MIO national currency)*		**Conversion from Statistics NACE 90 to Joint Questionnaire Table 5**			
		Variables Table 4		***Variable NACE 90***	
Revenues		(A)	Investments	Gross fixed capital formation	632.9
Income from environmental services	6 443.0	(B)	Internal current expenditure	Total expenditure	3 490.3
of which				- Interest payments	
for governments	2 462.7			- Depreciation	
for industries	3 980.3			- Costs of work contracted out and paid services	
Income from sales of generated energy and by-products	251.7	(C)	Receipts from by-products	Revenues from by-products	727.6
Income from subsidiary activities	228.5			+ Revenues from non-EP services	
Other operating revenues (incl insurance benefits)	154.9			Income from subsidiary activities	
of which: subsidies	1.4				
interest received	64.7			+ Other operating Revenues	
Withdrawals from provisions	86.3			- Subsidies	
				+ 0.1 * Withdrawals from provisions1	
Extraordinary profits	85.3				
TOTAL	7 314.3			+ Extraordinary profits	
Expenditure		EXP 1	(A+B-C)		3 395.6
Costs of raw and secondary materials	200.9	(D)	Subsidies/Transfers	Subsidies	1.4
Costs of work contracted out and paid services	2 326.6	(E)	Fees/Purchases	Costs of work contracted out and paid services	2 326.6
of which			*of which to Public sector*		
Treatment of waste	1 648.8	(F)	Revenues	Income from environmental services (main activity)	6 520.7
Transport of waste	274.6			+ 0.9 * Withdrawals from provisions1	
clean-up of polluted soil	182.0	EXP 2	(EXP 1- D + E + F)		-799.9
Other	221.3				
Purchase value of trade activities	19.8				
Personnel costs	1 496.3				
Energy costs	108.8				
Depreciation	782.1				
Car costs	330.8				
Other operating expenses	1 122.8				
Interest payments	427.4				
Additions to provisions	154.5				
Extraordinary liabilties	56.3				
TOTAL	7 026.4				
	287.2				
Gross fixed capital formation	632.9				

1) Only a small part of Withdrawals from provisions originate from non-EP activities, 10% is the estimate for the Dutch situation.

4. Variables

This questionnaire includes six main economic variables which are described briefly below. For specifics about Specialised Producers and Households, see 3.3 and 3.4 above.

4.1 Investment expenditure

Investment expenditure includes all outlays in a given year (purchases and own-account production) for machinery, equipment and land used for Environmental Protection purposes. Total investment in a sector or industry is the sum of two categories.

- End-of-pipe investments: These investments do not affect the production process itself, and the amount of pollution generated, instead they serve to treat pollution already generated.
- Investments in integrated technologies: These are investments which lead to a modified or adapted production process. They serve to reduce the amount of pollution generated. When a new production process is introduced, the Environmental Protection expenditure consists of the outlays over and above what would have been paid for a cheaper, viable, but less environmentally benign equipment. Where an existing plant is modified, the environmental investment is equal to the total outlay for the environmental adaptation.

Investment expenditure includes purchases of associated and adapted capital goods such as septic tanks (end-of-pipe) and catalytic converters (integrated). These are sometimes not part of specific surveys but estimated based on existing information e.g. on number of units and unit costs. The coverage of adapted and connected products in the figures reported should be specified, as this could vary considerably between countries.

Integrated investments are not asked for specifically in the questionnaire but are calculated indirectly through the difference between the variables “total investments” and “of which end-of-pipe”. Please make a note of the coverage if the figures reported as total investments in the Business sector do not cover both categories.

There is no division of investments into categories for the Public sector and Specialised producers. These investments are usually of an end-of-pipe type and the basic data sources (e.g. production statistics) do not allow this distinction.

4.2 Internal Current expenditure

Internal current expenditure includes the use of energy, material, maintenance and own personnel for measures made by the sector to protect the environment. A large part of internal expenditure is related to operating environmental protection equipment. There is also other internal expenditure such as general administration, education, information, environmental management and certification, research and development.

Internal current expenditure includes purchases of associated and adapted non-capital goods such as extra cost for low sulphur fuels. These are sometimes not part of specific surveys but estimated based on existing information e.g. on number of units and unit costs. The coverage of adapted and associated products in the figures reported should be specified, as this could vary considerably between countries.

Internal current expenditure excludes purchases of environmental protection services bought from the Public sector or Specialised producers such as waste collection, sewage treatment, environmental consultancy services, or surveillance fees. All such purchases should be reported under Fees/Purchases as they only finance EXP I in other sectors.

The concept Total current expenditure for environmental protection (used e.g. in industry surveys and in the SBS regulation) includes both internal current expenditure and fees/purchases. Only when the basic data sources do not provide a division between the two, should the total amount be reported under Internal current expenditure along with a note of the coverage. If possible, provide an estimate of the share of fees/payments for EP services in total current expenditure.

4.3 Receipts from by-products

Sometimes Environmental Protection activities produce by-products that have an economic value. These could either be sold and generate revenues, or be used internally and lead to reductions in costs. Examples include energy generated or material recovered, as a result of waste treatment. There should always be a specific Environmental Protection activity (and expenditure) that these receipts stem from. Receipts from by-products are the sum of the sales value and the value of the cost-saving (if used internally) related to these by-products.

Energy or material savings due to more efficient processes and other productivity gains resulting from Environmental Protection activities are not to be included as Receipts from by-products.

For Specialised producers (Table 4), this variable should be interpreted as revenues from by-products plus *revenues from non-environmental protection activities, see 3.4 above.*

4.4 Subsidies/Transfers

Subsidies/Transfers include all types of transfers financing Environmental Protection activities in other sectors, including transfers to or from other countries. These constitute part of financing expenditure for the paying sector, and reduce the financing of EXP I in the receiving sector. When a sector both receives and gives transfers, the net amount should be recorded.

Included are payments of so called **"ear-marked" environmental taxes** (e.g. general pollution taxes), which are not payments for a bought service but where the revenues are ear-marked for financing environmental protection measures. Payments of general environmental or green taxes (such as energy taxes) where the revenues are not ear-marked for financing environmental protection measures are excluded.

4.5 Fees/Purchases

Fees/Purchases includes all purchases of environmental protection services, both from public and private producers. These payments are clearly linked with an environmental protection activity performed outside the enterprise and should exclude e.g. fines and penalties. The payments include:

- Payments to specialised producers (enterprises) for waste and wastewater collection and treatment and payments to environmental consultants linked e.g. with environmental management and education.

- Payments to the Public sector for waste and wastewater collection and treatment (whatever the name of the payments – fees, charges etc.) as well as permits and surveillance fees.

Payments of taxes directly used for financing environmental protection expenditure – so called earmarked environmental taxes are excluded, but should be reported as Subsidies/Transfers. Payments of general environmental or green taxes (such as energy taxes) are excluded completely from this questionnaire.

4.6 Revenues

Public sector and Specialised producers receive the payments for bought environmental protection services (the Fees/Purchases). These are entered as revenues in the respective sector. These revenues should be deducted from abater expenditure (EXP I) in order to evaluate their financing expenditure (EXP II).

5. ENVIRONMENTAL DOMAINS

In this questionnaire, the scope of environmental protection expenditure is defined according to the Single European Standard Statistical Classification of Environmental Protection Activities (CEPA). The CEPA, prepared by UN-ECE and Eurostat, was adopted by the Conference of European Statisticians in June 1994. CEPA was revised in 2000.

CEPA distinguishes nine different environmental domains. In the questionnaire, all domains that do not have a separate column should be included in the column “other”. The ordering of the columns now follows the ordering in CEPA. Most of the questionnaire tables have separate columns for the first six environmental domains. The column “other” then includes activities for the CEPA domains seven to nine: Radiation, Research and development, Other environmental protection activities.

Sometimes the basic data sources do not cover all environmental domains of CEPA. If this is the case, the coverage should be specified.

Basic data sources do sometimes not allow for the required detailed domain breakdown. Difference in domain coverage should be specified (e.g. when expenditure in the category “other” also includes expenditure relating to e.g. Biodiversity or Noise).

Please note

CEPA 2000 specifies that expenditure for prevention of emission to water is included in the domain Wastewater and all expenditure for de-contamination and clean-up of soil, groundwater and surface water should be included in the domain Soil and Groundwater.

ENVIRONMENTAL PROTECTION EXPENDITURE AND REVENUES (EPER)

Table 1: PUBLIC SECTOR (1)

Please specify if public specialised producers are included!

Please specify!

Country: _____ _____

MIO national currency

Expenditure	Year	Air	Wastewater	Waste	Soil & Groundwater	Noise	Biodiversity & Landscape	Other (6)	TOTAL (7)
(A) INVESTMENT EXPENDITURE	1990								
Sum of end-of-pipe and integrated	1995								
	1996								
	1997								
	1998								
	1999								
	2000								
	2001								
	2002								
	2003								
	2004								
	2005								
(B) TOTAL CURRENT EXPENDITURE (= B1 + B2)	1990								
	1995								
	1996								
	1997								
	1998								
	1999								
	2000								
	2001								
	2002								

	2003								
	2004								
	2005								
(B1) Internal current expenditure (2)	1990								
Excluding all payments for bought	1995								
services	1996								
	1997								
	1998								
	1999								
	2000								
	2001								
	2002								
	2003								
	2004								
	2005								
(B2) Fees / purchases (3)	1990								
Paid to other sectors. Includes all	1995								
payments for bought services	1996								
	1997								
	1998								
	1999								
	2000								
	2001								
	2002								
	2003								
	2004								
	2005								
(C) RECEIPTS FROM BY-PRODUCTS	1990								
	1995								
	1996								
	1997								
	1998								
	1999								

	2000								
	2001								
	2002								
	2003								
	2004								
	2005								
(D) SUBSIDIES/TRANSFERS (4)	1990								
Paid to other sectors	1995								
	1996								
	1997								
	1998								
	1999								
	2000								
	2001								
	2002								
	2003								
	2004								
	2005								
(E) REVENUES (5)	1990								
Received from other sectors	1995								
	1996								
	1997								
	1998								
	1999								
	2000								
	2001								
	2002								
	2003								
	2004								
	2005								
EXPENDITURE I (= A + B1 - C)	1990								
	1995								
	1996								
	1997								
	1998								

EXPENDITURE II (= EXP I + B2 + D - E)	1999								
	2000								
	2001								
	2002								
	2003								
	2004								
	2005								
	1990								
	1995								
	1996								
	1997								
	1998								
	1999								
	2000								
	2001								
	2002								
	2003								
	2004								
	2005								
YOUR FOOTNOTES ➔									

eurostat

Please specify!

ENVIRONMENTAL PROTECTION EXPENDITURE AND REVENUES (EPER)	Table 4: PRIVATE & PUBLIC SPECIALISED PRODUCERS OF EP SERVICES (1)
Country: _____ _____	

MIO national currency Expenditure	Year	Wastewater	Waste	Soil & Groundwater	Other (6)	TOTAL
(A) INVESTMENT EXPENDITURE	1990					
Total investments	1995					
	1996					
	1997					
	1998					
	1999					
	2000					
	2001					
	2002					
	2003					
	2004					
	2005					
(B) TOTAL CURRENT EXPENDITURE (= B1 + B2)	1990					
	1995					
	1996					
	1997					
	1998					
	1999					
	2000					
	2001					
	2002					
	2003					

	2004					
	2005					
(B1) Internal current expenditure (2)	1990					
Total material and labour costs	1995					
	1996					
	1997					
	1998					
	1999					
	2000					
	2001					
	2002					
	2003					
	2004					
	2005					
(B2) Fees / purchases (5)	1990					
Payments for environmental services	1995					
	1996					
	1997					
	1998					
	1999					
	2000					
	2001					
	2002					
	2003					
	2004					
	2005					
of which to Public sector (table 1)	1990					
	1995					
	1996					
	1997					
	1998					
	1999					
	2000					
	2001					
	2002					
	2003					
	2004					

	2005					
(C) RECEIPTS FROM BY-PRODUCTS (3)	1990					
Energy, recycled materials and revenues from non-	1995					
environmental activities	1996					
	1997					
	1998					
	1999					
	2000					
	2001					
	2002					
	2003					
	2004					
	2005					
(D) SUBSIDIES/TRANSFERS	1990					
Received	1995					
	1996					
	1997					
	1998					
	1999					
	2000					
	2001					
	2002					
	2003					
	2004					
	2005					
(E) REVENUES	1990					
Total revenues from the environmental (main) activity	1995					
	1996					
	1997					
	1998					
	1999					
	2000					
	2001					
	2002					
	2003					
	2004					

	2005					
EXPENDITURE I (= A + B1 - C)	1990					
	1995					
	1996					
	1997					
	1998					
	1999					
	2000					
	2001					
	2002					
	2003					
	2004					
	2005					
EXPENDITURE II (= EXP I + B2 - D - E)	1990					
	1995					
	1996					
	1997					
	1998					
	1999					
	2000					
	2001					
	2002					
	2003					
	2004					
	2005					
YOUR FOOTNOTES ➔						

EPEA tables

TABLE A : National expenditure by components and by users/beneficiaries

year :

COMPONENTS OF NATIONAL EXPENDITURE FOR ENVIRONMENTAL PROTECTION	USERS/BENEFICIARIES								
	Producers				General Government as collective consumer		Households as actual consumers	Rest of the world	Total
	Specialised producers		Other producers						
	General Government	Other	non-specialised	non-characteristic	Central government	Local government			
1. Consumption of specific products									
1.1 Final consumption of environmental protection services									
market									
non-market									
1.2 Intermediate consumption of environmental protection services									
market									
ancillary									
1.3 Final consumption of									
associated products									
adapted products									

1.4 Intermediate consumption of			
associated products			
adapted products			
2. Gross capital formation for environmental protection activities			
3. Gross capital formation in specific products			
in associated products			
in adapted products			
in environmental protection services			
4. Specific transfers*			
4.1 subsidies on production			
environmental protection services			
adapted and associated products			
4.2 other specific transfers			
current			
capital			

5. Total uses of resident units (1+2+3+4)		
current uses		
capital uses		
6. Financed by the rest of the world		
current uses		
capital uses		
7. National expenditure for environmental protection (5-6)		
current		
capital		

TABLE C : Financing of national expenditure for environmental protection

FINANCING UNITS	USERS/BENEFICIARIES									
	Producers				General Government as collective consumer		Households as actual consumers	Rest of the world	Total	Of which : current expenditure
	Specialised producers		Other producers							
	General Government & NPISHs	Other	non-specialised	non-characteristic	Central government	Local government				
1. General Government										
Central government										
Local government										
2. NPISHs										
3. Corporations										
Specialised producers										
Other producers										
4. Households										
NATIONAL EXPENDITURE										
ROW										
Uses of resident units										

TABLE B1 : Supply and use table for characteristic services

	Non-market	Market	Ancillary	Total
1. Use of resident units (purchaser's price)				
1.1 Intermediate consumption				
1.1.1 of which specialised producers				
1.1.2 of which other producers				
1.2 Final consumption				
1.3 Gross capital formation (land improvement)				
2. Exports				
Total uses (1+2) = total supply (3+4+5+6)				
3. Output				
4. Imports				
5. Non-deductible VAT				
6. Other taxes less subsidies on products				

TABLE C1 : Environment-related financial burden

ELEMENTS OF ENVIRONMENT-RELATED FINANCIAL BURDEN	SECTORS				
	Corporation		Households including NPISHs	General goverment	Total
	Environmental industries	Non-environmental industries			
1. Financing of current national expenditure 2. Nondeductible VAT on current expenditure 3. Taxes on production 4. Net operating surplus 5. Any other profits 6. Interest on fixed capital					
A Financial burden of environmental protection (1+2+3-4-5+6)					
B Environment-related tax burden					
CO2 tax					
Water agency					
Environment-related financial burden (A+b)					

Annex 3: Examples of identification of environmental share of some budget lines/programmes and subsidies

Budget item/programme	Description	Environmental domain (CEPA) if classified as EPE	Environmental share of the item
Energy Efficiency Best Practice	Provision of advice for the adoption of energy saving schemes	Protection of ambient air and climate (CEPA 1)	100%
Energy Saving Trust		Protection of ambient air and climate (CEPA 1)	100%
Home Energy Efficiency Scheme		Protection of ambient air and climate (CEPA 1)	100%
Smoke control		Protection of ambient air and climate (CEPA 1)	100%
Cleaner Vehicles Programmes	Expenditures on encouraging the use and development of greener cars	Protection of ambient air and climate (CEPA 1)	100%
Energy Efficiency overseas		Protection of ambient air and climate (CEPA 1)	100%
Non-fossil fuel obligation	Means of subsidising renewable energy	Protection of ambient air and climate (CEPA 1)	100%
Integrated pollution control	Expenditure by the Environment Agency on implementation of IPC, etc.	Protection of ambient air and climate (CEPA 1)	100%
Clean Air Act	Expenditures by local authorities on management of local air quality	Protection of ambient air and climate (CEPA 1)	100%
Freight grants	Capital grants to encourage use of rails rather than road freight	Protection of ambient air and climate (CEPA 1)	100%
Allocated departmental costs		Protection of ambient air and climate (CEPA 1)	Evaluation of share needed
Miscellaneous programme expenditure		Protection of ambient air and climate (CEPA 1)	Evaluation of share needed
Wastewater treatment		Wastewater management (CEPA 2)	100%
Rural sewerage	Expenditures by local authorities on provision of sewerage services in rural areas	Wastewater management (CEPA 2)	100%
Allocated departmental costs		Wastewater management (CEPA 2)	Evaluation of share needed
Waste monitoring	Expenditures by the	Waste management (CEPA	100%

	Environment Agency on monitoring waste arising, transportation and disposal	3)	
Waste collection and disposal	Expenditures by local authorities primarily on municipal waste	Waste management (CEPA 3)	100%
Allocated departmental costs		Waste management (CEPA 3)	Evaluation of share needed
Other programme expenditure		Waste management (CEPA 3)	Evaluation of share needed
Contaminated land	Expenditure on the remediation of contaminated land	Protection and remediation of soil, groundwater and surface water (CEPA 4)	100%
Land quality	Expenditures by the Environment Agency on contaminated land	Protection and remediation of soil, groundwater and surface water (CEPA 4)	100%
British waterways pollution control	Expenditures on water pollution prevention and control by public authorities responsible for the maintenance of the waterways network	Protection and remediation of soil, groundwater and surface water (CEPA 4)	100%
Water quality monitoring	Expenditures by the Environment Agency on monitoring river water quality	Protection and remediation of soil, groundwater and surface water (CEPA 4)	100%
Derelict land			
Environmentally sensitive areas			
Agri-environmental spending	Schemes encouraging farmers to act in an environmentally sensitive way		
International programmes			
Miscellaneous programmes			
Programme and departmental expenditure			
CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora)			
Darwin Initiative (contribution to	Protection and remediation of soil,	100%	

international biodiversity protection fund)	groundwater and surface water (CEPA 4)		
National Wildlife Crime Intelligence Unit	Protection and remediation of soil, groundwater and surface water (CEPA 4)	100%	
Reserve Enhancement scheme	Can cover all CEPA activities but the main purpose principle leads to a restriction of the domains concerned: Protection and remediation of soil, groundwater and surface water (CEPA 4) OR Protection of biodiversity and landscape (CEPA 6)	Evaluation of share needed	
Natural Nature Reserve Management grants	Protection and remediation of soil, groundwater and surface water (CEPA 4)	Evaluation of share needed	100%
Water resource conservation (case of UK)	Protection and remediation of soil, groundwater and surface water (CEPA 4)	Evaluation of share needed	100%
National and country parks	Noise and vibration abatement (CEPA 5)	Evaluation of share needed	Evaluation of share needed as expenditures concerning exclusively access issues (facilities for people visiting the parks, etc.) are excluded. Expenditures for the general management of Natural Parks (without any details on the nature of the activities carried out) are included
Nuclear	Protection of	100%	100%

Decommissioning (UKAEA)	biodiversity and landscape (CEPA 6)		
Environmental Research and Monitoring	Protection of biodiversity and landscape (CEPA 6)	100%	100%
Education and administration	Protection of biodiversity and landscape (CEPA 6)	100%	Evaluation of share needed as teaching activities are considered as EPE only if it specifically aims at environmental protection
	Protection of biodiversity and landscape (CEPA 6)	100%	

Environmentally motivated subsidies	**Environmental domain (CEPA) if classified as EPE**	**Environmental share of the item**
Emission-reducing subsidies		
Different supports in the climate area	Protection of ambient air and climate (CEPA 1)	100%
Supports for climate investments	Protection of ambient air and climate (CEPA 1)	100%
Energy-related subsidies		
Investment subsidy to reduce the use of energy	Protection of ambient air and climate (CEPA 1)	100%
Investment subsidy for renewable energy	Protection of ambient air and climate (CEPA 1)	100%
Support to introduce windpower, etc, on the market	Protection of ambient air and climate (CEPA 1)	100%
Resource-related subsidies		
Environmental research	R&D for environmental protection (CEPA 8)	100%
Measures for improving the environment in the agricultural sector	Protection of landscape and biodiversity (CEPA 6)	Evaluation of share needed
Support to sanitation of polluted areas	Protection and remediation of soil, groundwater and surface water (CEPA 4)	100%

Annex 4: The Italian method for the functional analysis of expenditure

Often the functional reclassification of public budgets cannot be carried out as easily as the economic one. The functional classifications used in public budgets generally do not include *ad hoc* categories related to EP expenditures according to CEPA or COFOG definitions; therefore, building up 'bridge systems' between those functional classifications and the functional classification of the reference accounting system (CEPA; or COFOG) may or may not be satisfactory in terms of accuracy of the results and cost-effectiveness. A more 'analytical approach' thus needs to be followed, which consists in the analysis of every single expenditure item shown in a public budget in order to identify and classify those including EP expenditures.

This way of performing the budget analysis is labour intensive. Its effectiveness depends on the quantity and quality of the information shown in the public budgets. Furthermore it can lead to subjective results, which should be avoided to the extent possible by means of appropriate procedures.

In order to make the analysis as manageable as possible, Istat adopts a two-step functional reclassification process: the first step is exclusively based on the use of the information contained in the budgets while the second step involves the use of additional information and/or estimate coefficients. A number of operating tools have been developed by Istat in order to standardise as much as possible the results and to guarantee good quality data.

Istat's approach for the functional reclassification of budgets and the main related tools are described in the following document: Istat (1999), *The Istat methodology for calculating Public Expenditure on environmental protection*, Eurostat, Working Document ACCT-EXP/99/4.2.5-Item 4.2 of the agenda, Joint meeting of the Working party 'Economic accounts for the environment' and the Sub-Group 'Environmental expenditure statistics', Working Group "Statistics of the environment", Meeting of 6-7 December, 1999, Luxembourg.

In this paragraph the main characteristics of the approach are summarised and some examples are given.

The approach is currently applied on regular basis for producing data on EPE for the Italian Ministries (which represent the majority of Central Government): so far the time period 1995-2004 has been produced[47]. The methodology has also been applied to a number of Regional administrations[48].

[47] See:

- Istat (2006), *La spesa per la protezione dell'ambiente delle Amministrazioni dello Stato. Anni 2001-2004*, Istat, Statistiche in breve, http://www.istat.it/conti/ambientali/
- Istat (2005), *La spesa per la protezione dell'ambiente delle Amministrazioni dello Stato. Anni 1995-2002*, Istat, Statistiche in breve, Roma, http://www.istat.it/conti/ambientali/

The average number of expenditure items totally included in the budgets of Ministries every year is around 7000.

[48] See:

- Istat (2006), *Primi aggregati regionali di contabilità ambientale*, Istat, http://www.istat.it/ambiente/contesto/ambientale/index.html, which includes the time series 1995-2001 on EPE carried out by the Regional Administration of Lazio;
- Regione Lazio (2005), *Rapporto sullo Stato dell'Ambiente del Lazio 2004*, § 16.2 "Le spese ambientali della regione Lazio – anni 1995-2000", Roma, http://www.arpalazio.it/pubblicazioni/pubblicazioni.php

The average number of expenditure items included every year in the budget of the Regional Administration of Lazio is around 1200.

A handbook providing operational guidelines to perform budget analyses has been published jointly by Istat and the Ministry of the Environment[49].

1 First step: preliminary screening of the budget

1.1: 'Intermediate groups' of expenditure items

The main difficulties one can find, when examining one by one all the single expenditure items, concern essentially the following issues:

(a) The huge number of expenditure items to be analysed;

(b) The features of the information source, i.e. the public budget: sometimes to identify non-EP and EP expenditure items, and also to classify the latter according to CEPA, is easy; other times it is not so and a number of more complicated situations can occur, e.g.:

- One single expenditure item can include both EP and non-EP expenditures;

- EP expenditures in the same item can belong to different CEPA categories;

- The information on the expenditure item may not be enough to decide whether the expenditure item includes EP expenditure or not;

(c) The risk of introducing subjective criteria in the analysis of the expenditure items.

In order to manage the first two issues listed above (points *a* and *b*) Istat adopts a two-step reclassification process aiming at exploiting as much as possible the information included in the budget and then avoiding as much as possible the need to research extra information. A number of operating tools has been developed in order to limit the risk of introducing subjective criteria in the analysis and then to make sure to the extent possible that different people get the same results when analysing budgets (point *c*).

The first step is exclusively based on the use of the information contained in the budgets.

This is a preliminary screening of the budget, to be made in order to:

- Identify the expenditure items which do not need further analysis, i.e.:

- Items which certainly do not include Environmental Protection Expenditures (NEPE items);

- Items which certainly only include Environmental Protection Expenditure and are homogeneous enough to be classified in a single CEPA class (EPE items);

- Identify the expenditure items which do need further analysis, i.e.:

- Uncertain Expenditure items, for which there is not enough information to exclude or select them as environmental protection items (UE items);

- Non-homogeneous Expenditure items, which include both EP and non-EP expenditure (NHE items);

- Items which include more than one CEPA class (multi-CEPA items), as far as both the NHE and the EPE intermediate groups are concerned.

[49] See: Istat (2007), Il calcolo della spesa pubblica per la protezione dell'ambiente. Linee guida per riclassificare i rendiconti delle amministrazioni pubbliche, Metodi e norme n. 33/2006, Roma, http://www.istat.it/dati/catalogo/20070212_00/

Table 1: Definitions of the 'Intermediate' groups of expenditure items

NEPE **Non-Environmental Protection Expenditure:** expenditure incurred for activities and actions not intended for environmental protection
EPE **Environmental Protection Expenditure:** expenditure incurred for activities and actions intended for environmental protection
PEPE **Purely Environmental Protection Expenditure:** expenditure incurred for activities and actions exclusively intended for environmental protection
MEPE **Multi-purpose Environmental Protection Expenditure:** expenditure incurred for activities and actions which simultaneously and in combination serve multiple purposes including that of environmental protection; for such activities, attainment of the purpose of environmental protection necessarily includes attainment of the other purposes or is included in it
NHE **Non-Homogeneous Expenditure:** expenditure incurred for multiple activities and actions among which some but not all are definitely intended for environmental protection (exclusively or in combination)
UE **Uncertain Expenditure:** expenditure incurred for activities and actions which *might* be entirely or partly intended for environmental protection

The first step does not lead to the calculation of EPE, but just to an 'intermediate' result, i.e. the identification of the expenditure items for which the analysis stops (NEPE and EPE groups) and those for which further analyses are needed (UE, NHE and multi-CEPA groups). For this reason the groups are referred to as 'intermediate'.

In order to standardise the process (i.e. 'different people leading to the same results'), a number of operating tools have been developed:

- A 'decision tree' to allocate the expenditure items to the 'intermediate' groups;

- A set of 'CEPA operational sheets', one for each CEPA class. Each sheet describes the content of the CEPA class and its sub-categories in a very detailed and structured way, pointing out as much as possible the activities typically carried out by General Government. The sheets are used as a check list to decide whether the expenditure items include EPE or not and, if so, to classify them according to CEPA[50];

- Lists of Frequently Occurring Cases (FOC); these include the most frequent 'borderline cases' occurring in the Italian public budgets, relating to policy fields involving the natural environment in some way, without having any immediate correspondence, however, with CEPA items. The lists of FOC for each case report:

- The 'wordings' usually used in public budgets:

- The possible activities 'hidden' behind those wordings;

[50] Examples of operational sheets concerning CEPA1994 are included in Istat (1999); the full set of the CEPA1994 operational sheets is available in Istat (2000). Istat has also compiled CEPA2000 operational sheets, mainly based on the CEPA Explanatory notes (not available for CEPA1994) and on CEPA1994 sheets. This new version of the sheets is available in Italian only in Istat (2007).

- How to classify the activities according to the intermediate groups and CEPA.

The FOC lists, like the CEPA operational sheets, are used as check lists for including the expenditure items within the intermediate groups and classifying them by CEPA.

These kinds of lists are the result of studies and consultation of experts for in depth understanding of the kinds of activities that can be carried out within certain policy fields and their relationship with the EP field. The 'stock' of check lists increases with the accumulation of experience in the analysis of public budgets.

Examples of 'Multi-purpose Environmental Protection Expenditure'

The EPE group is made up of two sub-groups, i.e.:

1) PEPE **Purely Environmental Protection Expenditure:** expenditure incurred for activities and actions exclusively intended for environmental protection;

2) MEPE **Multi-purpose Environmental Protection Expenditure:** expenditure incurred for activities and actions which simultaneously and in combination serve multiple purposes including that of environmental protection; for such activities, attainment of the purpose of environmental protection necessarily includes attainment of the other purposes or is included in it;

MEPE represents a particular kind of EP expenditure, i.e. expenditure financing activities or actions which, by their nature or because of the way of implementation, are not capable of pursuing environmental-protection objectives without at the same time meeting other purposes directly and immediately.

According to the SERIEE manual (Eurostat, 1994a) and the EPEA Compilation guide (Eurostat, 2002), multi-purpose expenditures should be classified on the basis of the 'main purpose' criterion. To apply the 'main purpose' criterion to MEPE, however may be very difficult or subjective.

Examples of MEPE are:

(a) Administrative and regulatory activities relating to particular policy fields and/or carried out by particular organs or institutions (public authorities, special Committees, etc.), e.g. management and planning activities carried out:

- To administrate catchment areas,

- To administrate and valorise certain natural areas or resources.

To make a plan, e.g. for managing a catchment area, implies the programming of activities and investments which match EP purposes in addition to natural Resource Use and Management (RUM) purposes and purposes other than environmental (e.g. economic or human health purposes). While the single activities and investments that have been planned relate often to a main purpose which is quite easily identifiable, the planning and managing activity is typically a multi-purpose activity and to apportion it to several aims could be very subjective.

(b) Research & Development activities relating to particular policy fields and/or carried out by particular organs or institutions, e.g.:

- Preparatory studies that are often required by law in order to make management plans of catchment areas or development plans concerning certain territories or resources,

- Studies concerning the state of natural resources,

- Studies made by national and regional environmental protection agencies.

Often these studies simultaneously touch environmental issues relating both to EPEA and RUMEA scopes and sometimes they also deal with non-environmental issues; hence to apportion the R&D activities to the various purposes on the basis of substantial criteria appears very difficult.

(c) Monitoring or information and communication activities which consist in developing integrated information/communication systems, e.g. making:

- A GIS,

- An information system relating to land use/land cover,

- An information system relating to inland waters, or other natural resources, or other territorial issues (e.g. geological maps);

- A report on the state of the environment.

All these activities usually imply the collection and processing of information relevant from the point of view of EPEA-type activities, and also of RUMEA-type activities and of activities falling outside of any kind of SERIEE scope.

(d) Monitoring and control activities relating to particular policy fields and/or carried out by particular organs or institutions (e.g. special forces), e.g.:

- Control activities carried out by the harbour offices which have the task of keeping watch on the safety of the sea in a broad sense, i.e. including controlling possible illegal polluting discharges or accidental pollution in addition to helping people or ships in danger, and monitoring whether the limits on fishing are respected, etc.

- Control activities carried out by forest rangers who have to monitor correct use of forest resources in addition to protecting the biodiversity of forests and animal species living in forest areas.

These kinds of control and monitoring activities serve at the same time EP and RUM purposes and also non-environmental purposes. To apportion to the different purposes the human and material resources used as an input for carrying out the control activities is very difficult.

For EPEA purposes accounting for these kinds of expenditure can be managed by following guidelines given in Chapter XXI of the SNA93 manual in Sections A: 'satellite analysis' and C: 'functionally oriented satellite accounts'. These sections in particular specify that, where one activity serves at the same time various separate purposes for which separate satellite accounts are desired, the activity is to be considered for the purposes of all the accounts to which it is relevant. The expenditure relating to this is therefore to be shown in full in each of those accounts (which will therefore not be additive), and not assigned to

one or other of these, nor divided between them (either of these approaches would be arbitrary)[51].

The creation of the 'MEPE' category and the full inclusion of such expenditure within the EPEA scope stem from these SNA93 instructions.

This criterion should be applied only for activities that cannot be split between purposes for the way in which they are carried out and not for lack of detailed information; otherwise EPE could be hugely overestimated.

An ad hoc code attached to these expenditure items (i.e. the codes attributed to MEPE according to the 'decision tree') gives the chance to recall and process them in the future, in particular in a way that makes it possible to build up additive satellite accounts (for example also in the case that RUMEA is implemented together with EPEA).

2. Second step: calculation of EPE

2.1. A 'multi-method' approach

The public budget expenditure items including EPE need to be summed to obtain EP expenditure aggregates, according to:

- An economic criterion: to sum all the EPE items relating to a like ESA 95 variable (e.g. P2 - intermediate consumption, P51 - gross fixed capital formation, etc.);

- A functional criterion: to sum all the EPE items belonging to a like CEPA class.

This means in practice cross-classifying EP expenditure according to the scheme reported in Table 2 and to sum all the EP expenditure items of each cell of the scheme.

Table 2: Cross classification of EPE expenditure items taken from public budgets

CEPA classes	**ESA 95 variables covered by EPEA accounting tables**					**Total by CEPA**
	D1	**P2**	**…**	**P51**	**…**	
Protection of ambient air and climate						
Wastewater management						
Waste management						
Protection and remediation of soil, groundwater and surface water						
Noise and vibration abatement (excluding workplace protection)						
Protection of biodiversity and landscapes						
Protection against radiation (excluding external safety)						
Research and development						
Other environmental protection activities						
Total by ESA 95 variable						

[51] See in particular United Nations (1993), Ch. XXI, §§ 21.38, 21.52, 21.65.

Doing this, however, is not possible yet at the end of the first step of the functional reclassification, because the expenditure items classified in the EPE intermediate groups (PEPE and MEPE) do not represent the whole EPE of the budget: part of it is certainly included in the Non-Homogeneous Expenditure items (NHE) and another part may or may not be included in the Uncertain Expenditure items (UE). In addition to that, filling in the cross classification scheme of Table 2 may be prevented in the case of 'multi-CEPA' items.

For all these kinds of items - i.e. NHE, UE and 'multi-CEPA' - further analyses are needed in order to obtain a complete final estimate of EPE.

A special case which is worth mentioning is that of '*general administration current expenditure*', i.e. internal current expenditure (costs of production) not explicitly and exclusively attributable to specific functions. In principle these expenditure items are shared by the different activities carried out by public administrations so that at the end of the first step they are classified in the UE intermediate group. If the GG units at issue are characteristic producers (whether specialised or not), in order to obtain a complete estimate of EPE, a part of the '*general administration current expenditures*' should be attributed to EP.

Table 3 summarises the kinds of expenditure items that after the first step need a second step analysis, specifying the goal to be reached at the end of this analysis. As is clear from reading the table, to maximise the efficiency of the second step analyses, the different kinds of expenditure items should be treated in the same order as they are listed in Table 3.

Table 3: Second step analyses of expenditure items

Expenditure items that need second step analyses	**Goal of the second step analysis**
Uncertain Expenditure items (UE)	To establish the aim of the expenditures. If they are EPE or NEPE the analysis stops; if they are NHE and/or multi-CEPA they have to be treated like all the other NHE and/or multi-CEPA items (see points 2 and 3 below)
Non-Homogeneous Expenditure items (NHE)	To calculate the EP share. This should be done for all the NHE items, regardless of whether they have been classified as such at the first step of the functional reclassification or at the second step (being included in the UE group at the end of the first step)
'Multi-CEPA' items	To break down EPE between the various pertinent CEPA classes. This should be done for all the EP expenditure items, i.e. regardless of the intermediate group which the items belong to (EPE at the first step; EPE at the second step being UE at the first step; NHE at the first step; NHE at the second step being UE at the first step)
'General administration current expenditure' items (UE items classified under economic codes relating to internal current expenditure)	To calculate the EP share and break down it between the various pertinent CEPA classes. Only if the GG units at issue are characteristic producers (regardless of whether they are specialised or not)

The second step analyses can be carried out by means of several kinds of methods:

- To analyse more detailed financial information relating to the outlays of the items to be further investigated. This method requires extra financial data from public administrations. It is the most accurate method and can be applied to all the kinds of expenditure items listed in Table 3;

- To interview 'informed' people, i.e. persons who are likely to know which activities have been carried out by means of the financial resources of the items to be further investigated (e.g. public managers who are directly responsible for the expenditure to be further analysed). This method requires keeping in touch with public administrations, but it does not involve the need for additional data. Usually it is helpful and cost-effective for clarifying the content of UE items; it is instead difficult to apportion NHE or multi-CEPA items just by contacting informed people, without getting some additional data;

- To make *ad hoc* studies on some particular policy fields to which the expenditure items to be further investigated are related. This method usually does not require asking public administrations for further information, but it involves further investigation on the desk and/or contacts with technicians. Often the outcome is the identification of general rules for classifying expenditure items relating to particular kinds of activities, i.e. what previously have been referred to as 'FOC lists' (see § 1);

- To use statistical coefficients to estimate the EP share of NHE items or to break down the multi-CEPA expenditures. Coefficients can be calculated in different ways, e.g.: parameters derived from technical literature or provided by technicians, coefficients calculated on the basis of official statistics or on the basis of financial data taken from the reclassified budgets.

The Italian experience recommends using preferably the most accurate methods among those listed above and, in any case, not using statistical coefficients for items with high expenditure figures.

As far as coefficients are concerned, priority should be given to parameters calculated on the basis of physical or monetary indicators correlated as much as possible to input[52] or output[53] of the activities funded through the expenditure items to be further investigated. As a last option, coefficients can be calculated on the basis of financial data derived from the public budgets at the end of the functional reclassification process. Such kinds of coefficients are described in the next paragraph.

Practical experience shows that the different kinds of expenditure items (EPE, NEPE, UE, NHE, multi-CEPA) do not systematically appear under some particular sections or categories within public budgets; on the contrary they can be found anywhere. A number of environmental policy fields can be identified, however, which may need further analysis and/or estimation, e.g. in Italy: water services expenditure, which is often shown as a whole and then has to be broken down into waste water (to be included in the EPEA) and water supply; soil protection and sea and coastal zones protection expenditure, which often includes NEPE, UE and NHE; etc.

[52] E.g. number of employees or labour hours by activity.
[53] E.g. purchases of the different services provided by the public administrations under examination.

2.2. The 'last' option: financial coefficients

2.2.1. Non-Homogeneous Expenditure items

In order to quantify and classify the EP expenditure for the items that have been classified as NHE or multi-CEPA in the first step of the reclassification process, it is possible to use coefficients calculated on the basis of resulting aggregates at the end of the same step.

As far as the NHE items are concerned, the aim is to quantify the share regarding EP expenditure. If there is no additional data that makes it possible to exactly quantify the EP share, estimate coefficients can be calculated on the basis of the following general formula:

$$ {}_{k}Coe_{env} = \frac{{}_{k}EPE}{{}_{k}EPE + {}_{k}NEPE} \qquad (1) $$

where ${}_{k}Coe_{env}$ (ranging from 0 to 1) indicates how much of each expenditure item relating to the economic variable *k* concerns environmental protection.

On the basis of formula (1), different coefficients should be calculated, one for each economic variable *k*. Furthermore, at least two separate coefficients should be calculated, one for the expenditure items relating to the activities carried out by the public administrations under examination (internal current expenditure and investments) and the other one for those concerning transfers to other economic units (current and capital).

Such coefficients should be calculated, every year, separately for each public administration (e.g. for each Ministry) or each top level division of each public administration (e.g. for each department of a Regional administration), depending on the kinds of institutional functions attributed to the GG units at issue. If there were not enough information for calculating the coefficients (e.g. due to the fact that in a certain administration/department no EPE items have been identified) the average coefficient calculated for a homogenous group of units can be applied (e.g. the average coefficient calculated for all the Ministries or all the departments of a Regional administration).

Practical experience suggests that such coefficients are not very suitable for estimating EP shares for large size NHE expenditure items; on the other hand, often, for small size NHE expenditure items it is not worth looking for additional information. As a matter of fact the whole organisation of the approach into two steps aims at making the analysis as manageable as possible, while maintaining the accuracy of the results; in practice, the aim is to minimise the number of expenditure items which has to be analysed in depth at the second step, in addition to the use of approximate methods (e.g. estimate coefficients). For example (see Table 4), for the years 1995-2002, the UE items which needed further analysis in the second step of Istat's procedure were 16.2 percent of all the expenditure items included in the Ministries budgets, corresponding to 5.1 percent of total outlays. On the other side the estimate coefficients described above for NHE items were applied to 3.3 percent of the items, corresponding to only 1.2 percent of total outlays.

Table 4: Uncertain Expenditure (UE) and Non-homogeneous Expenditure (NHE) items in the Central Government budgets (Ministries), 1995-2002

Items	Percentage of the total Central Government expenditure (average of 1995-2002 period)	
	N. of expenditure items	Outlays
UE	16.2 %	5.1 %
NHE	3.3 %	1.2 % (of which 96 % has been attributed to NEPE in the 2d step)

2.2.2. 'Multi-CEPA' Expenditure items

With regard to the multi-CEPA items, the aim is to break down the EP expenditure among the various CEPA classes under which the item is classified. In the absence of more detailed data the solution could be to turn to the use of estimate coefficients, calculated on the basis of the following formula, exemplified for an item classified under two CEPA classes only, referred to as $CEPA_x$ and $CEPA_i$:

$$ {}_k Coe_{CEPA_x} = \frac{{}_k EPE_{(CEPA_x)}}{{}_k EPE_{(CEPA_x)} + {}_k EPE_{(CEPA_i)}} \;,\; {}_k Coe_{CEPA_i} = \frac{{}_k EPE_{(CEPA_i)}}{{}_k EPE_{(CEPA_x)} + {}_k EPE_{(CEPA_i)}} \qquad (2) $$

where ${}_k Coe_{CEPAx}$ (ranging from 0 to 1) indicates how much of the EP expenditure of each item relating to the economic variable *k* shall be classified in the CEPA class *x*; ${}_k Coe_{CEPAx} + {}_k Coe_{CEPAi} = 1$.

On the basis of formula (2), for each possible combination of CEPA classes, different groups of coefficients should be calculated, one for each economic variable *k*. At least two separate groups of coefficients should be calculated, one for the expenditure items relating to the activities carried out by the public administrations under examination (internal current expenditure and investments) and the other one for those concerning transfers to other economic units (current and capital)[54].

For cases where more than two CEPA classes are at issue, formula (2) can be generalised as follows:

$$ {}_k Coe(CEPA_h) = \frac{{}_k EPE(CEPA_h)}{\sum_{i \in SET(CEPA)} {}_k EPE(CEPA_i)} \quad , \quad \forall\, h \in \mathrm{SET(CEPA)} \qquad (3) $$

where '*SET(CEPA)*' indicates all the possible combinations of two or more CEPA classes.

The above coefficients should be calculated, for every reference year, separately for each homogenous group of units (e.g. all the Ministries, all the departments of a Regional administration, etc). These coefficients are more suitable if calculated for homogenous groups of units than for a singular unit. As a matter of fact often an administration or a department carries out EPE mainly relating to a number of CEPA classes and there might

[54] For the years 1995-2002 the formula (2) was applied by Istat to 1.4 percent of the expenditure items included in the Ministries' financial accounts.

not be enough data for apportioning possible multi-CEPA items to other CEPA classes (there may not be enough EPE items classified under individual CEPA classes available for use in formulas like those described above). Normally, after the first step of the functional reclassification a good distribution of EPE broken down by the 9 CEPA classes is available at the level of homogenous groups of units.

The multi-CEPA items may include exclusively environmental protection expenditure or include also expenditure other than for EP (NHE). In the first case the breakdown among CEPA classes concerns the expenditure as a whole, while in the second case the breakdown among CEPA classes concerns only the EP expenditure part, previously calculated possibly by means of formula (1).

2.2.3. General administration current expenditure items not attributable to specific functions

Every administration carries out internal current expenditures (cost of production) not specifically and exclusively connected to a number of its activities, but related to some extent to all the activities. These are, for example, the compensation of the employees of the administration (not relating to a special part of the employees carrying out a particular activity) or the purchases of goods and services for the general running of the administration (e.g. energy). During the first step of the functional reclassification process the internal current expenditure items relating to some particular activities are usually identified and classified within the NEPE or EPE or NHE groups. Instead, after the first step, the internal current expenditure items not specifically and exclusively attributable to certain particular activities end up in the UE group. These outlays, here referred to as '*General Administration Current Expenditure*' (GACE), can then be identified by means of two coordinates: 1) from the **functional** point of view they belong to the UE intermediate group and 2) from the **economic** point of view they are classified in the budget under economic categories relating to internal current expenditure.

In principle all the GACE should be apportioned properly to the different activities carried out by the public administrations; if the GG units are characteristic producers (whether specialised or not), in order to obtain a complete estimate of EPE, a part of the GACE should be attributed to EP and broken down according to the different EP activities carried out by the administrations, i.e. into the CEPA classes under which the EP expenditures have been classified.

In practice this means considering the GACE items as both:

- NHE items

- multi-CEPA items, relating to all the CEPA classes under which the EP expenditures carried out by the administrations have been classified.

The EP share of GACE can be estimated by means of a coefficient calculated on the basis of formula (1) and the estimated EP share can in turn be broken down into the pertinent CEPA classes through coefficients calculated on the basis of formula (3). In particular the coefficients used by Istat are as follows:

$$Coe_{env} = \frac{EPE}{EPE + NEPE} \qquad (4)$$

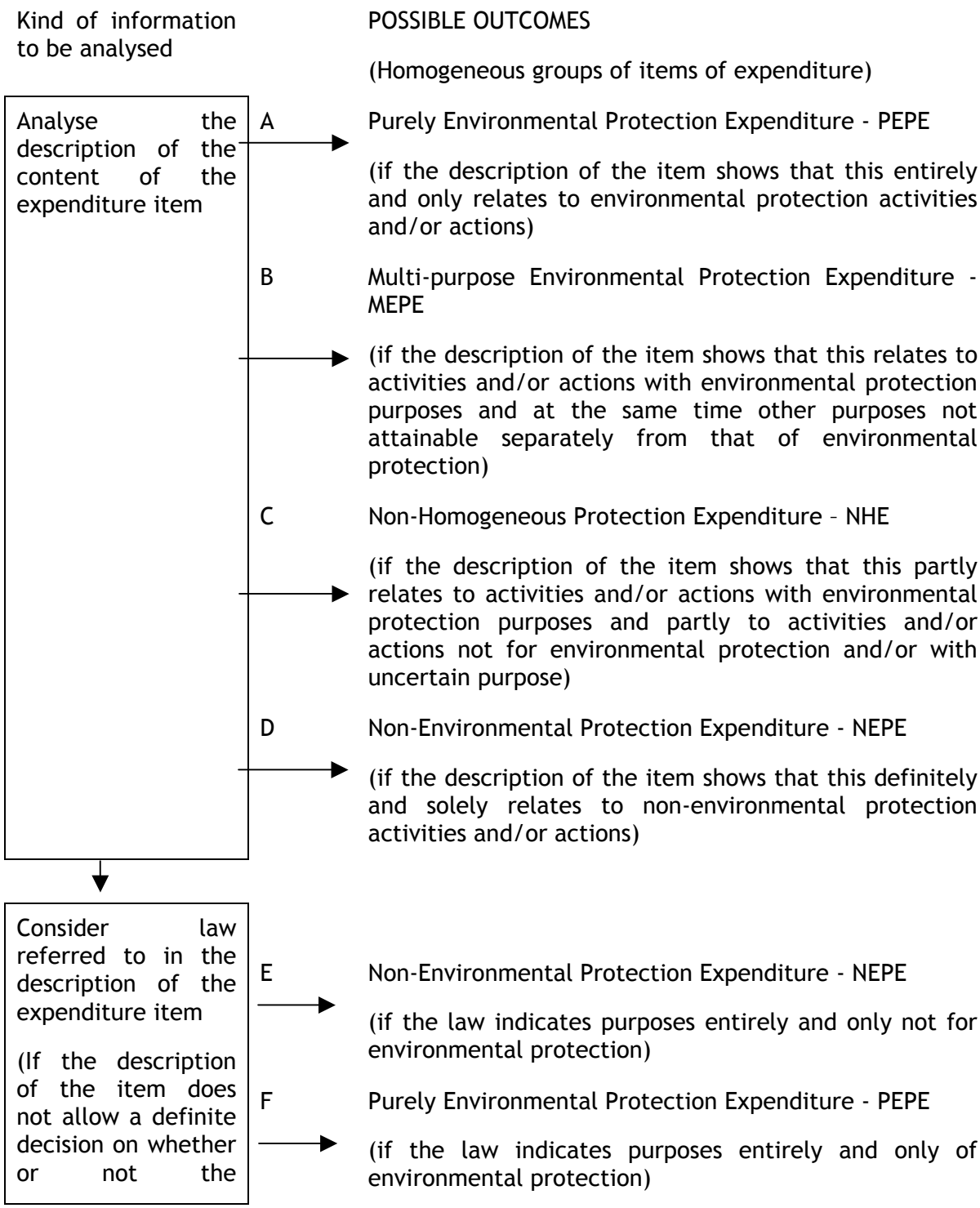
$$Coe(CEPA_h) = \frac{EPE(CEPA_h)}{\sum_{i \in SET(CEPA)} EPE(CEPA_i)} \quad , \qquad \forall\, h \in \text{SET(CEPA)} \qquad (5)$$

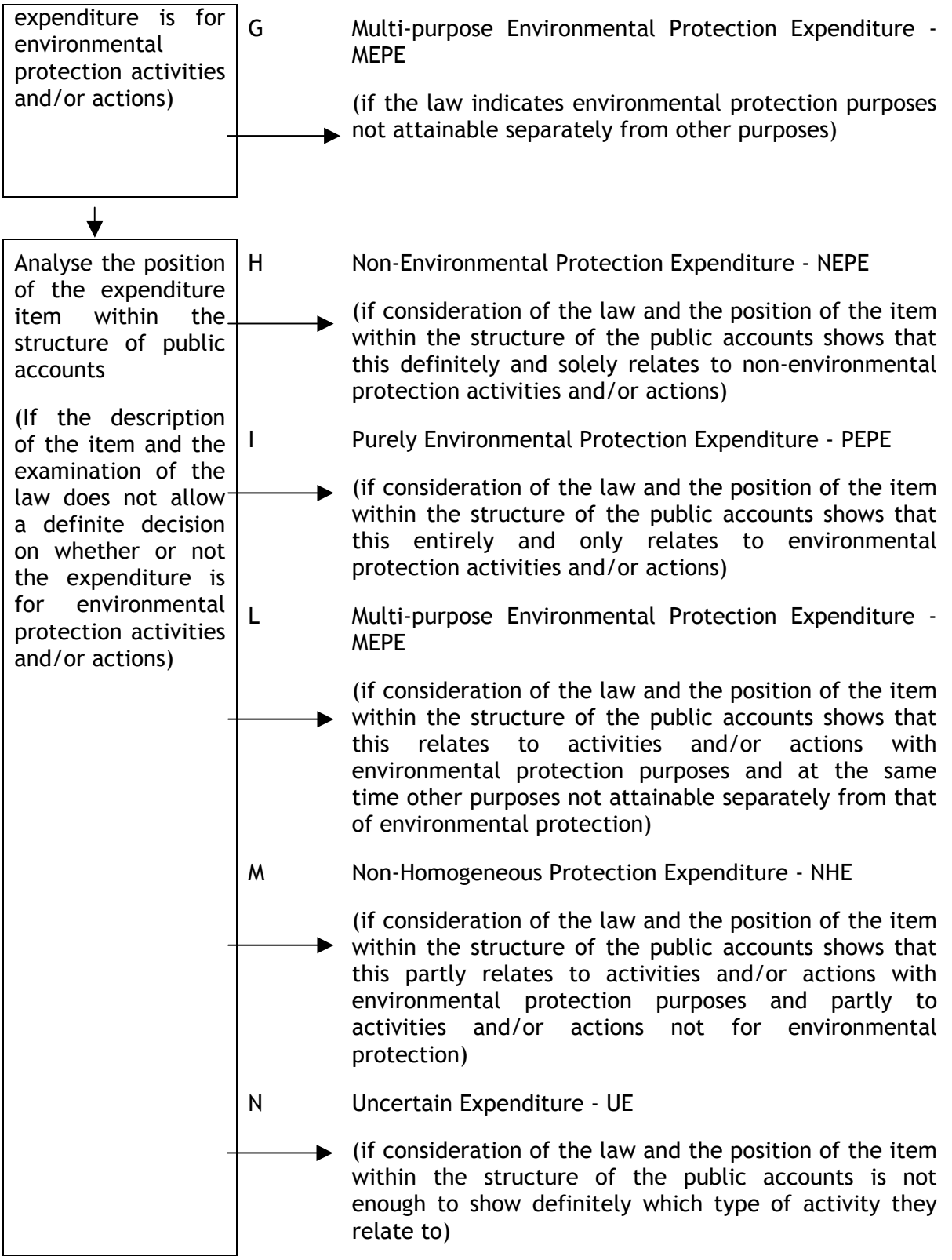
Unlike formulas (1) and (3), formulas (4) and (5) do not refer to specific economic variables (*k)* and are calculated on the basis of total EPE and NEPE. In this way the assumption is that the EP share of the general administration current expenditure (and the parts relating to the different CEPA classes) is proportional to total financial resources devoted to EP, including those transferred to other units; thus the EP share of GACE is representative of both the general administration current expenditure attributable to the EP activities carried out directly by the administration analysed and those attributable to the 'administrative activity' consisting in managing EP transfers (e.g., authorisation, distribution, monitoring activities, etc.).

Formulas 4 and 5 are calculated on the basis of budget data as they result after the first step of the functional reclassification process and the second step analyses carried out for the kinds of expenditure items listed at points 1-3 of Table 3.

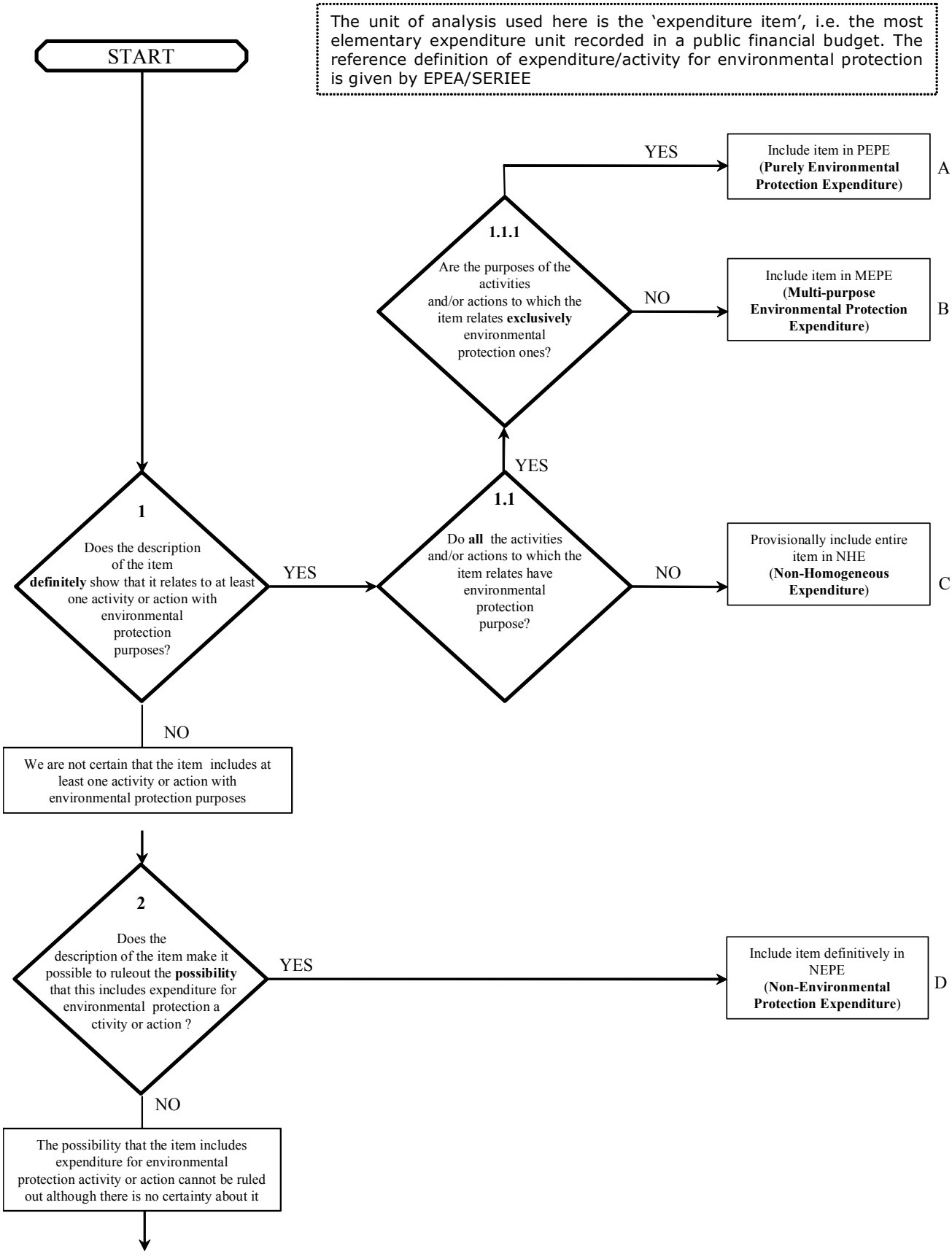
Annex 5: Istat's "Decision Tree" (revised version)

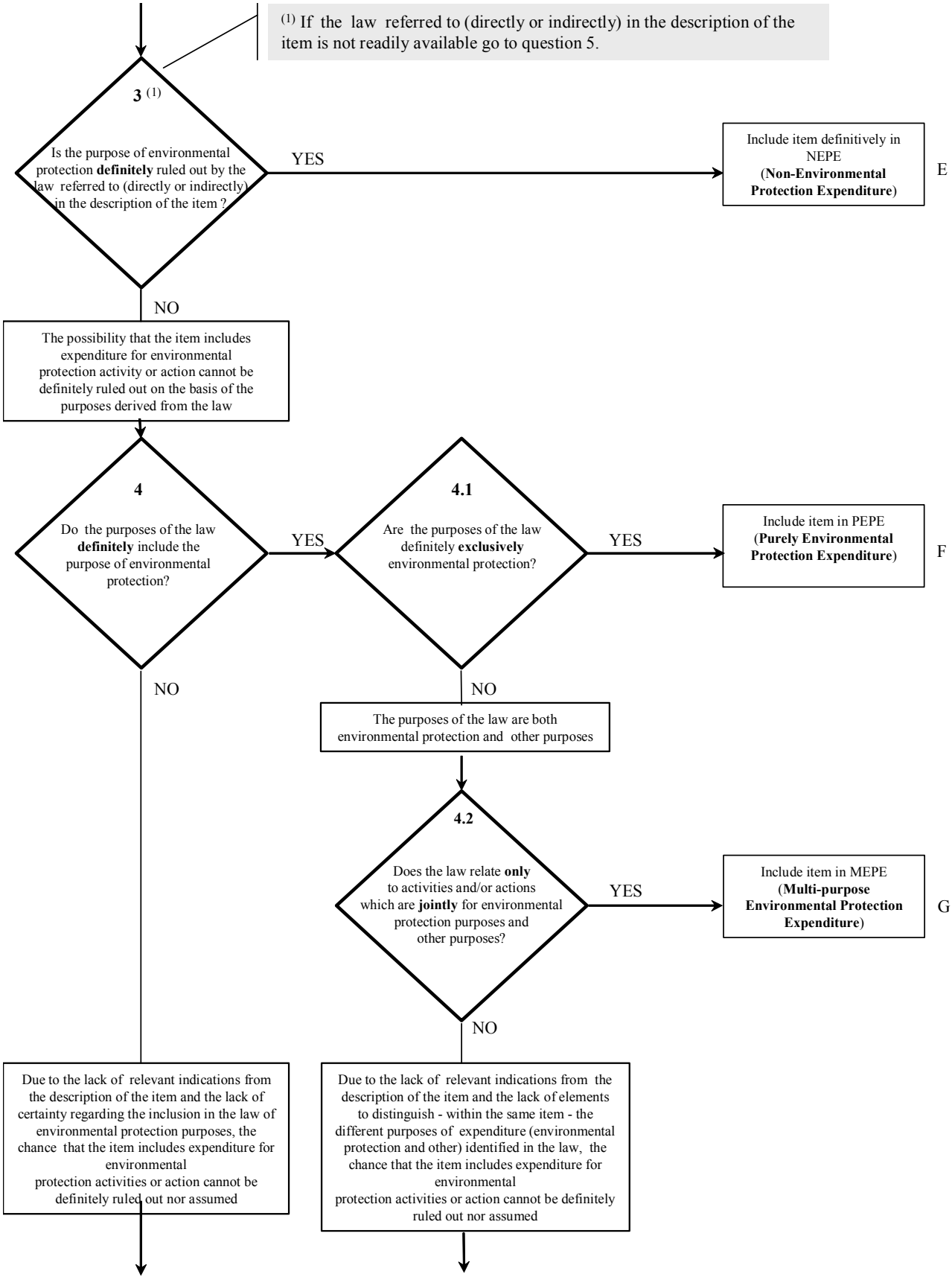
1. Synoptic presentation

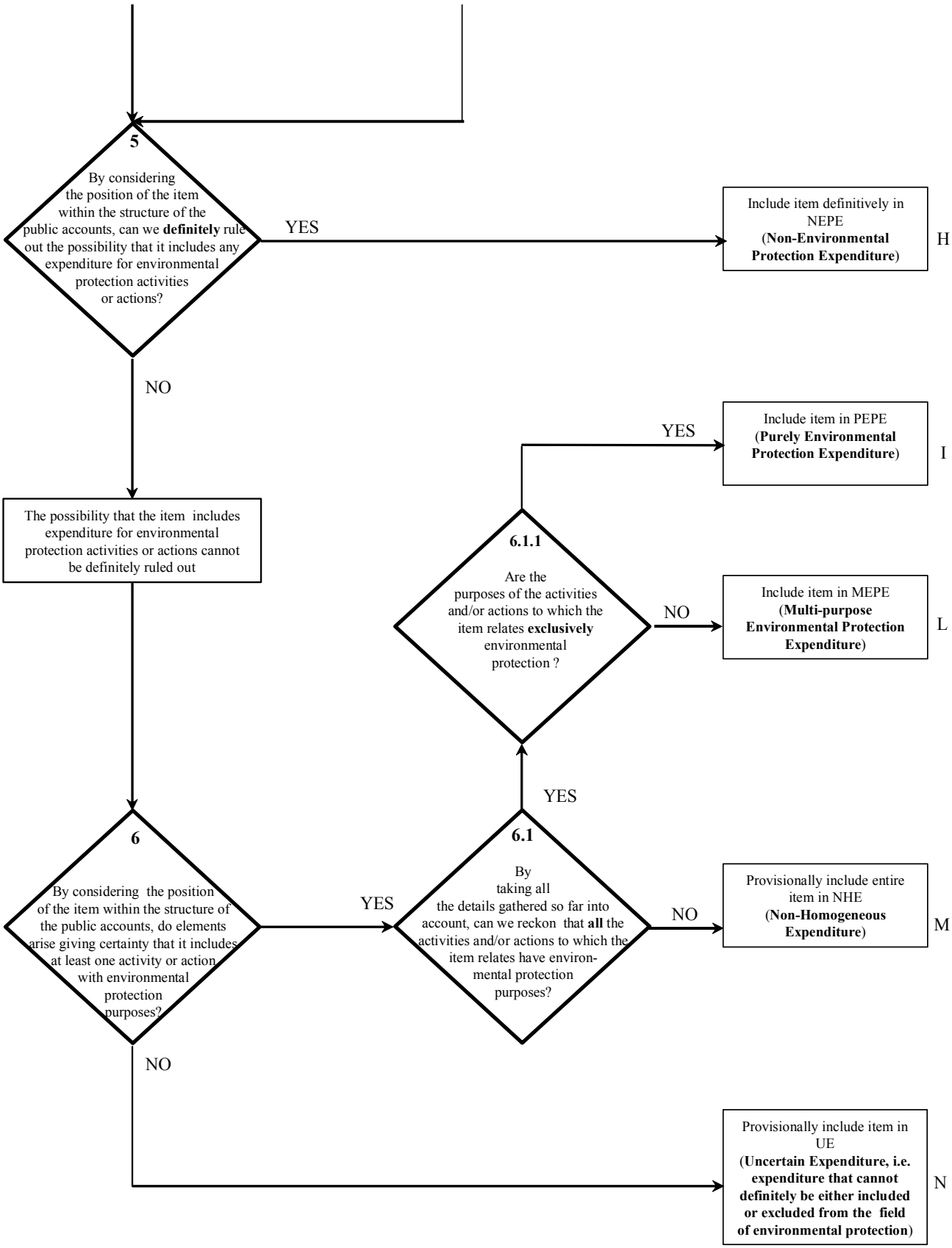



expenditure is for environmental protection activities and/or actions)
G
Multi-purpose Environmental Protection Expenditure - MEPE
(if the law indicates environmental protection purposes not attainable separately from other purposes)
Analyse the position of the expenditure item within the structure of public accounts
(If the description of the item and the examination of the law does not allow a definite decision on whether or not the expenditure is for environmental protection activities and/or actions)
H
Non-Environmental Protection Expenditure - NEPE
(if consideration of the law and the position of the item within the structure of the public accounts shows that this definitely and solely relates to non-environmental protection activities and/or actions)
I
Purely Environmental Protection Expenditure - PEPE
(if consideration of the law and the position of the item within the structure of the public accounts shows that this entirely and only relates to environmental protection activities and/or actions)
L
Multi-purpose Environmental Protection Expenditure - MEPE
(if consideration of the law and the position of the item within the structure of the public accounts shows that this relates to activities and/or actions with environmental protection purposes and at the same time other purposes not attainable separately from that of environmental protection)
M
Non-Homogeneous Protection Expenditure - NHE
(if consideration of the law and the position of the item within the structure of the public accounts shows that this partly relates to activities and/or actions with environmental protection purposes and partly to activities and/or actions not for environmental protection)
N
Uncertain Expenditure - UE
(if consideration of the law and the position of the item within the structure of the public accounts is not enough to show definitely which type of activity they relate to)

2. The 'decision tree' in detail




(1) If the law referred to (directly or indirectly) in the description of the item is not readily available go to question 5.
3 (1)
Is the purpose of environmental protection definitely ruled out by the law referred to (directly or indirectly) in the description of the item ?
YES
Include item definitively in NEPE (Non-Environmental Protection Expenditure)
E
NO
The possibility that the item includes expenditure for environmental protection activity or action cannot be definitely ruled out on the basis of the purposes derived from the law
4
Do the purposes of the law definitely include the purpose of environmental protection?
YES
4.1
Are the purposes of the law definitely exclusively environmental protection?
YES
Include item in PEPE (Purely Environmental Protection Expenditure)
F
NO
NO
The purposes of the law are both environmental protection and other purposes
4.2
Does the law relate only to activities and/or actions which are jointly for environmental protection purposes and other purposes?
YES
Include item in MEPE (Multi-purpose Environmental Protection Expenditure)
G
NO
Due to the lack of relevant indications from the description of the item and the lack of certainty regarding the inclusion in the law of environmental protection purposes, the chance that the item includes expenditure for environmental protection activities or action cannot be definitely ruled out nor assumed
Due to the lack of relevant indications from the description of the item and the lack of elements to distinguish - within the same item - the different purposes of expenditure (environmental protection and other) identified in the law, the chance that the item includes expenditure for environmental protection activities or action cannot be definitely ruled out nor assumed


5
By considering the position of the item within the structure of the public accounts, can we **definitely** rule out the possibility that it includes any expenditure for environmental protection activities or actions?
YES
Include item definitively in NEPE (**Non-Environmental Protection Expenditure**)
H
NO
The possibility that the item includes expenditure for environmental protection activities or actions cannot be definitely ruled out
6
By considering the position of the item within the structure of the public accounts, do elements arise giving certainty that it includes at least one activity or action with environmental protection purposes?
YES
6.1
By taking all the details gathered so far into account, can we reckon that **all** the activities and/or actions to which the item relates have environ-mental protection purposes?
NO
Provisionally include entire item in NHE (**Non-Homogeneous Expenditure**)
M
YES
6.1.1
Are the purposes of the activities and/or actions to which the item relates **exclusively** environmental protection ?
NO
Include item in MEPE (**Multi-purpose Environmental Protection Expenditure**)
L
YES
Include item in PEPE (**Purely Environmental Protection Expenditure**)
I
NO
Provisionally include item in UE (**Uncertain Expenditure, i.e. expenditure that cannot definitely be either included or excluded from the field of environmental protection**)
N

Annex 6: Bulgarian questionnaire on protection and restoration of the environment

ADDRESSEE:
COMPILER:
Reporting unit:
Address: str., No.:

QUESTIONNAIRE
ON PROTECTION AND RESTORATION
OF THE ENVIRONMENT IN 2006

Form: EE 0801 0 | 1) Unified Identification Code by BULSTAT: Legal entity | LKU: | NACE grouping

STATISTICAL DOCUMENTATION

QUESTIONNAIRE "OOC - EXPENDITURE"

ANNUAL

Approved by the National Statistical Institute
Submitted by firms, firms' branches, municipal administrations, ministries and others up to: 31 March

TO REGIONAL STATISTICAL OFFICE

Expenditure on acquisition or maintenance is recorded in two separate tables (table I for acquisition and table II for maintenance). Financing of acquisition and maintenance are also recorded in two other tables.

Please indicate the average annual number of employees on labour or civil service contract dealing with environmental activities during the year.

Please indicate time taken to complete the questionnaire (minutes):

I. EXPENDITURE ON ACQUISITION OF TANGIBLE (TFA) AND INTANGIBLE FIXED ASSETS (IFA) WITH ECOLOGICAL USE. **/Thousand Levs/**

	Expenditure code	Total on acquisition of TFA and IFA	Tangible fixed assets	Of which on:			Intangible fixed Assets
			Column 2>=col.(3+4+5)	Construction and assembling activities	Machines, facilities and equipment	Exploration and design	
A	B	Col. 1 = c. (2+6)	2	3	4	5	6
EXPENDITURE ON ACQUISITION OF TFA AND IFA WITH ECOLOGICAL USE - TOTAL: /0200+0300+0400+0500+0600+0700+0801+0900+1001+1101+1401/	**1000**						
FOR WATER RESOURCES /0201+0202/	**0200**						//////////
End-of-pipe equipment	**0201**						//////////
of which: Industrial waste water treatment plants	0210						//////////
Municipal waste water treatment plants	0221						//////////
Integrated technologies	**0202**						//////////
FOR CIRCULATING WATER SUPPLY	**0300**						//////////
FOR PROTECTION OF THE AIR /0401+0402/	**0400**						//////////
End-of-pipe equipment	0401						//////////
Integrated technologies	0402						//////////
FOR PROTECTION OF SOIL AND GROUND WATER /0521+0522/	**0500**						//////////
End-of-pipe equipment	0521						//////////
Integrated technologies	0522						//////////
FOR PROTECTION OF FORESTS	**0600**			//////////	//////////		//////////
FOR PROTECTION OF BIODIVERSITY AND NATURAL SCENERY /0701+0702/	**0700**						//////////
End-of-pipe equipment	0701						//////////
Integrated technologies	0702						//////////
FOR HUNTING AND FISHERY PROJECTS	**0801**						//////////
FOR WASTE TREATMENT /0921+0922/	**0900**						//////////

Expenditure on fixed assets is detailed by environmental domains but also by use and nature of assets (tangible or intangible)

End-of-pipe equipment /0901+.....+0906/	**0921**							//////////////////////
equipment for non-hazardous waste recovery	0901							
equipment for hazardous waste recovery	0902							
equipment for non-hazardous waste disposal (landfills)	0903							//////////////////////
equipment for hazardous waste disposal (landfills)	0904							//////////////////////
other assets for removal, transportation and storage of non-hazardous waste (utensils for collecting and storage, transport vehicles, packing, weighing machines and others)	0905							//////////////////////
other assets for removal, transportation and storage of hazardous waste (utensils for collecting and storage, transport vehicles, packing, weighing machines and others)	0906							//////////////////////
Integrated technologies	**0922**							//////////////////////
FOR PROTECTION FROM NOISE /1011+1012/	**1001**							//////////////////////
End-of-pipe equipment	1011							//////////////////////
Integrated technologies	1012							//////////////////////
FOR LICENCES, PATENTS AND OTHERS	**1101**		//////////////////////	//////////////////////	//////////////////////	//////////////////////	//////////////////////	
MONITORING AND CONTROL EQUIPMENT	**1401**							//////////////////////

II. EXPENDITURE ON MAINTENANCE OF TANGIBLE FIXED ASSETS (TFA) WITH ECOLOGICAL USE AND ACTIVITIES DONE

	Expenditure code	Total on maintenance of TFA with ecological use	Distribution of expenditure by economic elements:					Activities done
			Materials	External services	Depreciation	Wages and salaries, social security, extra payments	Other expenditure	
		Thousand levs						**Decares**
A	B	Col.1 = col.(2+3+4+5+6)	2	3	4	5	6	7
EXPENDITURE ON MAINTENANCE OF TANGIBLE FIXED ASSETS (TFA) WITH ECOLOGICAL USE AND ACTIVITIES DONE-TOTAL: /0200+0300+0400+0500+0600+0700+0801+0900+1001+1101+1201+1301+1401/	**1000**							
FOR WATER RESOURCES /0201+0202/	**0200**							//////////////////////
End-of-pipe equipment	**0201**							//////////////////////
of which: Industrial waste water treatment plants	0210							//////////////////////
Municipal waste water treatment plants	0221							//////////////////////
Integrated technologies	**0202**							//////////////////////
FOR CIRCULATING WATER SUPPLY	**0300**							//////////////////////
FOR PROTECTION OF THE AIR /0401+0402/	**0400**							//////////////////////
End-of-pipe equipment	0401							//////////////////////
Integrated technologies	0402							//////////////////////
FOR PROTECTION OF SOIL AND GROUND WATER /0521+0522/	**0500**							
End-of-pipe equipment /0502.....0509/	**0521**							
Antierosion activities	0502							
Recultivation of waste landfills	0503							
Recultivation of other destructed areas	0504							

Cleaning of contaminated land	0505							
Chemical melioration	0506							
Biological and integrated plant protection	0507							
Draining	0508							
Others	0509							
Integrated technologies	**0522**							
FOR PROTECTION OF FORESTS	**0600**							
FOR PROTECTION OF BIODIVERSITY AND NATURAL SCENERY /0701+0702/	**0700**							//////////////////////
End-of-pipe equipment	0701							//////////////////////
Integrated technologies	0702							//////////////////////
FOR HUNTING AND FISHERY PROJECTS	**0801**							//////////////////////
FOR WASTE TREATMENT /0921+0922/	**0900**							
End-of-pipe equipment /0901+.....+0906/	**0921**							//////////////////////
equipment for non-hazardous waste recovery	0901							
equipment for hazardous waste recovery	0902							
equipment for non-hazardous waste disposal (landfills)	0903							//////////////////////
equipment for hazardous waste disposal (landfills)	0904							//////////////////////
other assets for removal, transportation and storage of non-hazardous waste (utensils for collecting and storage, transport vehicles, packing, weighing machines and others)	0905							//////////////////////
other assets for removal, transportation and storage of hazardous waste (utensils for collecting and storage, transport vehicles, packing, weighing machines and others)	0906							//////////////////////
Integrated technologies	**0922**							//////////////////////
FOR PROTECTION FROM NOISE /1011+1012/	**1001**							//////////////////////
End-of-pipe equipment	1011							//////////////////////
Integrated technologies	1012							//////////////////////
FOR LICENCES, PATENTS AND OTHERS	**1101**							//////////////////////
FOR EDUCATIVE, TRAINING AND OTHER SIMILAR ACTIVITY	**1201**							//////////////////////
FOR ADMINISTRATIVE ACTIVITY	**1301**							//////////////////////
MONITORING AND CONTROL EQUIPMENT	**1401**							//////////////////////

III. FINANCING SOURCES OF THE EXPENDITURE ON ACQUISITION OF TANGIBLE (TFA) AND INTANGIBLE FIXED ASSETS (IFA) WITH ECOLOGICAL USE /Thousand Levs/

	Expenditure code	Total	Own resources	Resources from The Central budget (state institutions, companies and others)	Municipal resources	Resources received purposively from the State (subsidies)	National Funds			Resources borrowed from sources within the country (excl. Col.6,7,8)	Resources from foreign sources[1]	
							Management of the environmen-tal protection activities (EMEPA)	Trusted ECO-FUND	Other Funds incl. Agriculture and others		Gratuitous financial assistance	Borrowed resources
A	B	Col.1=col.(2+..+10+11)	2	3	4	5	6	7	8	9	10	11
EXPENDITURE ON ACQUISITION OF TANGIBLE (TFA) AND INTANGIBLE FIXED ASSETS (IFA) WITH ECOLOGICAL USE - TOTAL : /0200+0300+0400+0500+0600+0700+0801+0900+1001+1101+1401/	**1000**											
FOR WATER RESOURCES /0201+0202/	**0200**											
End-of-pipe equipment	**0201**											
of which: Industrial waste water treatment plants	0210											
Municipal waste water treatment plants	0221											
Integrated technologies	**0202**											
FOR CIRCULATING WATER SUPPLY	**0300**											
FOR PROTECTION OF THE AIR /0401+0402/	**0400**											
End-of-pipe equipment	0401											
Integrated technologies	0402											
FOR PROTECTION OF SOIL AND GROUND WATER /0521+0522/	**0500**											
End-of-pipe equipment	0521											
Integrated technologies	0522											
FOR PROTECTION OF FORESTS	**0600**											
FOR PROTECTION OF BIODIVERSITY AND NATURAL SCENERY /0701+0702/	**0700**											
End-of-pipe equipment	0701											
Integrated technologies	0702											
FOR HUNTING AND FISHERY PROJECTS	**0801**											
FOR WASTE TREATMENT /0921+0922/	**0900**											
End-of-pipe equipment /0901+.....+0906/	**0921**											
equipment for non-hazardous waste recovery	0901											
equipment for hazardous waste recovery	0902											
equipment for non-hazardous waste disposal (landfills)	0903											
equipment for hazardous waste disposal (landfills)	0904											

The financing data are detailed by sources of financement.

other assets for removal, transportation and storage of non-hazardous waste (utensils for collecting and storage, transport vehicles, packing, weighing machines and others)	0905												
other assets for removal, transportation and storage of hazardous waste (utensils for collecting and storage, transport vehicles, packing, weighing machines and others)	0906												
Integrated technologies	**0922**												
FOR PROTECTION FROM NOISE /1011+1012/	**1001**												
End-of-pipe equipment	1011												
Integrated technologies	1012												
FOR LICENCES, PATENTS AND OTHERS	**1101**												
MONITORING AND CONTROL EQUIPMENT	**1401**												
1. SAPARD, ISPA AND OTHERS.													

IV. FINANCING SOURCES OF THE EXPENDITURE ON MAINTENANCE OF TANGIBLE FIXED ASSETS (TFA) WITH ECOLOGICAL USE AND ACTIVITIES DONE **/Thousand levs/**

	Expenditure code	Total	Own resources	Resources fromThe Central budget (state institutions, companies and others)	Municipal resources	Resources received purposively from the State (subsidies)	National Funds			Resources borrowed from sources within the country (excl. Col.6,7,8)	Resources from foreign sources[1]	
							Management of the environmental protection activities (EMEPA)	Trusted ECO-FUND	Gratuitous financial assistance incl. Agriculture and others		Gratuitous financial assistance	Borrowed resources
A	B	Col.1=col.. (2+...+10+11)	2	3	4	5	6	7	8	9	10	11
EXPENDITURE ON MAINTENANCE OF TFA WITH ECOLOGICAL USE AND ACTIVITIES DONE-TOTAL: /0200+0300+0400+0500+0600+0700+0801+0900+1001+1101+1201+1301+1401/	**1000**											
FOR WATER RESOURCES /0201+0202/	**0200**											
End-of-pipe equipment	**0201**											
of which: Industrial waste water treatment plants	0210											
Municipal waste water treatment plants	0221											
Integrated technologies	**0202**											
FOR CIRCULATING WATER SUPPLY	**0300**											
FOR PROTECTION OF THE AIR /0401+0402/	**0400**											
End-of-pipe equipment	0401											
Integrated technologies	0402											
FOR PROTECTION OF SOIL AND GROUND WATER /0521+0522/	**0500**											
End-of-pipe equipment /0502.....0509/	**0521**											
Antierosion activities	0502											
Recultivation of waste landfills	0503											

Recultivation of other destructed areas	0504											
Cleaning of contaminated land	0505											
Chemical melioration	0506											
Biological and integrated plant protection	0507											
Draining	0508											
Others	0509											
Integrated technologies	**0522**											
FOR PROTECTION OF FORESTS	**0600**											
FOR PROTECTION OF BIODIVERSITY AND NATURAL SCENERY /0701+0702/	**0700**											
End-of-pipe equipment	0701											
Integrated technologies	0702											
FOR HUNTING AND FISHERY PROJECTS	**0801**											
FOR WASTE TREATMENT /0921+0922/	**0900**											
End-of-pipe equipment /0901+.....+0906/	**0921**											
equipment for non-hazardous waste recovery	0901											
equipment for hazardous waste recovery	0902											
equipment for non-hazardous waste disposal (landfills)	0903											
equipment for hazardous waste disposal (landfills)	0904											
other assets for removal, transportation and storage of non-hazardous waste (utensils for collecting and storage, transport vehicles, packing, weighing machines and oth.)	0905											
other assets for removal, transportation and storage of hazardous waste (utensils for collecting and storage, transport vehicles, packing, weighing machines and others)	0906											
Integrated technologies	**0922**											
FOR PROTECTION FROM NOISE /1011+1012/	**1001**											
End-of-pipe equipment	1011											
Integrated technologies	1012											
FOR LICENCES, PATENTS AND OTHERS	**1101**											
FOR EDUCATIVE, TRAINING AND OTHER SIMILAR ACTIVITY	**1201**											
FOR ADMINISTRATIVE ACTIVITY	**1301**											
MONITORING AND CONTROL EQUIPMENT	**1401**											
1. SAPARD, ISPA AND OTHERS.												

V. ECOLOGICAL FINES AND SANCTIONS

/Thousand levs/

	CODE	ECOLOGICAL FINES AND SANCTIONS PAID /Art.3,Environment Protection Act/	OTHER ECOLOGICAL FINES AND SANCTIONS PAID
A	B	1	2
TOTAL /1701+1702+1703+1704+1705+1706/	**1700**		
FOR WATER RESOURCES	1701		
FOR AIR	1702		
FOR SOIL	1703		
FOR WASTE	1704		
FOR NOISE	1705		
OTHERS	1706		

Fines and sanctions are detailed by environmental domains.

VI. EXPENDITURE ON ACQUISITION OF TANGIBLE FIXED ASSETS (TFA) WITH ECOLOGICAL USE BY OBJECTS **/Thousand Levs/**

Title of Tangible Fixed assets with ecological use by objects	Code	No. of the tangible fixed asset	Code by UCATU*	Object's Value - Total	Financial resources spent since beginning of the project - TOTAL	Expenditure during the year	Of which:	
							on end-of-pipe equipment	on integrated technologies
A	B	C	1	2	3	4=Col..5+Col..6	5	6

1/ In column C please indicate numbers in order of the facilities of one and the same type, for instance code. 3111, 3112, 3113 .....3118.
2/ In column 5 please include only facilities that do not participate in the production process but serve for reduction of pollution resulting from the production.
3/ In column 6 please include elements of the production process only /technologies resulting in achievement of lower environmental pollution compared to other similar technologies. Often the equipment is fully integrated in the production process and cannot be identified as a separate component. In this case please report only the estimated share of the total investment, which is related to the choice of technology which is more friendly to the environment.
* Unified Classificator of Administrative-Territorial Units.

NOTES:

COMPILED: . . . . . Date . . . . . MANAGER: . . . .

/name, family name, tel./ CHIEF ACCOUNTANT: . . . . . .

VII. PURCHASE OF ENVIRONMENTAL PROTECTION SERVICES /Here is indicated the data break down from Chapter II, Column 1.

The expenditures on purchase of environmental protection activities are reported net of VAT. The imputed receipts from saving raw materials, energy and materials that instead of to be purchased on the market are replaced by production by-products are also excluded. (the receipts from sales of scraps are not included).

/Thouusand Levs/

	Expen-diture code	Total sum of purchased environ-mental protection services	From Column C: Purchased from specialised producers:				From Column C: Purchased from Public sector (municipalities and Central Government)				From Column C: Purchased of other environonmental services			
			Collecting, transportation and disposal of:		Waste water treatment	Services on consultation and education related to environment	Collecting, transportation nd disposal of:	Waste water treatment	Issuance of permits for carrying out services and control by:		Environ-mental construction realized by subtractor:	Current repair and maintenance of TFA with ecological use by subcontractor	Service on estimation and audit of environment related activities	Environ-mental monitoring
			Non-hazardous wastes	Hazar-dous wastes			Non-hazardous wastes by the municippalities		Munici-palities	State institutions				
A	B	C =Col.. 1+…+Col. 12	1	2	3	4	5	6	7	8	9	10	11	12
EXPENDITURE ON MAINTENANCE OF (TFA) WITH ECOLOGICAL USE AND ACTIVITIES DONE: /0200+0300+0400+0500+0600+0700+0801+0900+1001+1101+1201+1301+1401/	**1000**													
FOR WATER RESOURCES /0201+0202/	**0200**													
End-of-pipe equipment	**0201**													
of which: Industrial waste water treatment plants	0210													
Municipal waste water treatment plants	0221													
Integrated technologies	**0202**													
FOR CIRCULATING WATER SUPPLY	**0300**													
FOR PROTECTION OF THE AIR /0401+0402/	**0400**													
End-of-pipe equipment	0401													
Integrated technologies	0402													
FOR PROTECTION OF SOIL AND GROUND WATER /0521+0522/	**0500**													
End-of-pipe equipment /0502.....0509/	**0521**													
Antierosion activities	0502													
Recultivation of waste landfills	0503													
Recultivation of other destructed areas	0504													
Cleaning of contaminated land	0505													
Chemical melioration	0506													
Biological and integrated plant protection	0507													
Draining	0508													
Others	0509													
Integrated technologies	**0522**													
FOR PROTECTION OF FORESTS	**0600**													
FOR PROTECTION OF BIODIVERSITY AND NATURAL SCENERY /0701+0702/	**0700**													
End-of-pipe equipment	0701													
Integrated technologies	0702													
FOR HUNTING AND FISHERY PROJECTS	**0801**													
FOR WASTE TREATMENT /0921+0922/	**0900**													
End-of-pipe equipment /0901+.....+0906/	**0921**													
equipment for non-hazardous waste recovery	0901													
equipment for hazardous waste recovery	0902													
equipment for non-hazardous waste disposal (landfills)	0903													

Purchases of environmental services
ental
domains but also by service producers.

equipment for hazardous waste disposal (landfills)	0904													
other assets for removal, transportation and storage of non-hazardous waste (utensils for collecting and storage, transport vehicles, packing, weighing machines and others)	0905													
other assets for removal, transportation and storage of hazardous waste (utensils for collecting and storage, transport vehicles, packing, weighing machines and others)	0906													
Integrated technologies	**0922**													
FOR PROTECTION FROM NOISE /1011+1012/	**1001**													
End-of-pipe equipment	1011													
Integrated technologies	1012													
FOR LICENCES, PATENTS AND OTHERS	**1101**													
FOR EDUCATIVE, TRAINING AND SIMILAR ACTIVITY	**1201**													
FOR ADMINISTRATIVE ACTIVITY	**1301**													
MONITORING AND CONTROL EQUIPMENT	**1401**													

Annex 7: Description of variables used in Belgium

Table 1: The production table for the federal government (data description)

1. Current transactions	
1 Current uses	
1.1.1 Intermediate consumption	The intermediate consumption for the General Government was provided by the Federal Government Service for the budget, and includes the value of all goods and services used by the government in its production process (code 12-14).
1.1.4 Other taxes on production	
1.1.2 Compensation of employees	The compensation of employees was provided by the Federal Public Service for the Budget and includes the total compensation, both in money and in kind, that the government as employer is indebted to its employees.
1.1.3 Consumption of fixed capital	The amount of fixed capital consumption is not available for the environmental protection function of the federal government. The National Accounts Institute (NAI) makes the assumption that this amount is equal to zero. Since gross fixed capital formation in environmental protection has not been negligible in the past, this is not really correct. We therefore made a rough estimate on the basis of the CFC/output ratios presented in Eurostat (2002), page 71. We calculated the average ratio for government specialised producers for wastewater and waste, equal to 0.704 and 0.236 respectively, and applied these ratios to the available data on current uses in these domains.
1.1.5 Less other subsidies on production	These are equal to zero for all of the federal government's activities
1.1.6 Net operating surplus	The net operating surplus is assumed to be zero for the environmental protection activity in the national accounts.
1.2. Output (cost of production)	The output is calculated as the cost of production, i.e. the sum of intermediate consumption, compensation of employees, taxes less subsidies on production and consumption of fixed capital.
1.2.1 Non-environmental output	Not recorded for the government
1.2.2 Environmental protection output	The proportion of market output in total output is not available for the environmental function. It is available for all functions together though. We therefore assume the share of market output to be identical for all functions.
1.2.2.1 Non-market	Between 1997 and 2002 the share of market output was equal to 2.26 percent, 2.44 percent, 2.49 percent, 2.06 percent, 4.04 percent
1.2.2.2 Market	and 4.12 percent.
1.3 Current EP resources	Sum of market output and current transfers received
1.3.1 Market output (incl. partial payments)	The partial payments are supposed not to exist.
1.3.2 Current transfers	The amounts by function are not available, except for earmarked taxes. The rest of current transfers received for the environmental protection function are estimated from the current transfers given by the other institutional sectors.
2. Capital transactions	
2.1.Gross Fixed Capital Formation	Gross fixed capital formation was furnished by the Federal Public Services for the Budget and consists of the following components: purchase of domestic land and buildings (71) new buildings (72) roads and waterworks (73) acquisition of other investment goods (74)
2.2. Other capital uses	
2.3 Investment grants received	The amounts by function are not available. The capital transfers received for the function (05) are estimated from the capital transfers given by the other institutional sectors.
2.4 Other capital transfers received	
3 Financing by producers	The financing by producers is equal to the sum of current and capital uses minus current resources and capital transfers
4 Labour inputs	These data are not available
5 Stock of fixed assets	These data are not available

Table 2: The production table for the regional government (data description)

1. Current transactions	
1.1 Current uses	
1.1.1 Intermediate consumption	The intermediate consumption for the regional governments is available in the national accounts for the function “05”, environment, and includes -the intermediate consumption (P.2) - the other taxes on production (D.29) - the current taxes on production on income, wealth, etc. (D.5, which are equal to zero for all the functions) - the adjustment for the change in net equity of households funds reserves (D.8, which is equal to zero for all the functions)
1.1.4 Other taxes on production	
1.1.2 Compensation of employees	The compensation of employees (D.1) is available for the function “05” in the national accounts
1.1.3 Consumption of fixed capital	The amount of consumption of fixed capital (K.1) is not available for the environmental protection function of the regional governments. The National Bank makes the assumption that this amount is equal to zero. Since gross fixed capital formation in environmental protection has not been negligible in the past, this is not really correct. We therefore made a rough estimate on the basis of the CFC/output ratios presented in Eurostat (2002), page 71. We calculated the average ratio for government specialised for wastewater and waste, equal to 0.704 and 0.236 respectively, and applied these ratios to the available data on current uses in these domains.
1.1.5 Less other subsidies on production	These are equal to zero for all state government’s activities
1.1.6 Net operating surplus	The net operating surplus is equal to zero for all the state governments’ activities.
1.2. Output (cost of production)	The output is calculated via cost of production, i.e. the sum of intermediate consumption, compensation of employees, taxes less subsidies on production and consumption of fixed capital.
1.2.1 Non-environmental output	Not recorded for the government
1.2.2 Environmental protection output	The proportion of market output in total output is not available for the environmental function. It is available for all functions together though. We therefore assume the share of market output to be identical for all functions.
1.2.2.1 Non-market	Between 1997 and 2002 the share of market output was equal to 2.63 percent, 2.43 percent, 2.41 percent, 2.32 percent, 2.22 percent and 3.21 percent.
1.2.2.2 Market	These proportions were applied to the value of environmental protection output by the state governments.
1.3 Current EP resources	
1.3.1 Market output (incl. Partial payments)	The partial payments are supposed not to exist.
1.3.2 Current transfers	The current transfers received for the environmental protection function are based on environmental tax data and on data concerning the current transfers given by the other institutional sectors.
2. Capital Transactions	
2.1.Gross Fixed Capital Formation	Gross fixed capital formation and other capital uses are available for the function “05” in the national accounts. They consist of the gross fixed capital formation (P.5) and the acquisition less disposal of non financial non produced assests (K.2)
2.2. Other capital uses	
2.3 Investment grants received	The capital transfers received for the environmental protection function (05) are estimated on the basis of the analysis of the regional budgets.
2.4 Other capital transfers received	
3 Financing by producers	The financing by producers is equal to the sum of current and capital uses minus current resources and capital transfers.
4 Labour inputs	These data are only available for 1997-1998
5 Stock of fixed assests	These data are not available

Table 3: The production table for the local authorities *(economic accounts and estimation method)*

1. Current transactions	Economic accounts and estimation method
1.1 Current uses	
1.1.1 Intermediate consumption	The intermediate consumption for the local authorities is available in the national accounts for the function “05” and includes - The intermediate consumption (P.2), - The other taxes on production (D.29) - The current taxes on income wealth, etc. (D.5, which are equal to zero for all the functions) - The adjustment for the change in net equity of households funds reserves (D.8, which is equal to zero for the all functions)
1.1.4 Other taxes on production	
1.1.2 Compensation of employees	The compensation of employees (D.1) is available for the function “05”.
1.1.3 Consumption of fixed capital	The amount of fixed capital is not available for the EP function of the local authorities. The National Bank makes the assumption that this amount is equal to zero. Since gross fixed capital formation in EP has not been negligible in the past, this is not really correct. We therefore made a rough estimate on the basis of the CFC/output ratios presented in Eurostat (2002), page 71. We calculated the average ratio for government specialised producers for wastewater and waste, equal to 0.704 and 0.236 respectively, and applied these ratios to the available data on current uses in these domains.
1.1.5 Less other subsidies on production	In the national accounts, the subsidies on production are equal to zero for all local administrations’ activities
1.1.6 Net operating surplus	In the national accounts, net operating surplus is equal to zero for all local administrations’ activities
1.2. Output (cost of production)	The output is calculated via cost of production, i.e. the sum of intermediate consumption, compensation of employees, taxes less subsidies on production and consumption of fixed capital.
1.2.1 Non-environmental output	
1.2.2 Environmental protection output	
1.2.2.1 Non-market	The non-market output is obtained by subtracting the market output from the total output
1.2.2.2 Market	The market output is the sum of: - The sales of non-durable goods and services (16) - The refunding of maintenance works of the public roads and waterways (18) - The local taxes (36) which are considered to be the sales of waste management services (according to the National Bank methodology to build the National Accounts). Market output from 1997 to 2002 was found to be 74.27 percent, 73.07 percent, 69.13 percent, and 68.96 percent for the period 2000-2002. For the latter period the share is constant because we had to use the 2000 data as a proxy for 2001 and 2002. The National Bank of Belgium has been working on an analysis of the local governments’ accounts for the years 2001 and 2002, but this study was unfortunately not yet available at the time of the construction of the current EPEA tables for Belgium.
1.3 Current EP resources	
1.3.1 Market output (incl. Partial payments)	The partial payments are supposed not to exist
1.3.2 Current transfers	The current transfers received for the EP function (05) are estimated from the current transfers given by the other institutional sectors and on the basis of the environmental tax accounts
2. Capital transactions	
2.1.Gross Fixed Capital Formation	Gross fixed capital formation and other capital uses are available in the National Accounts and consist of the amount of gross fixed capital formation (P.5) and the acquisition less disposal of non financial non-produced assets (K.2)
2.2. Other capital uses	
2.3 Investment grants received	The capital transfers received for the EP function (05) are estimated from the capital transfers given by the other institutional sectors.
2.4 Other capital transfers received	
3 Financing by producers	The financing by producers is equal to the sum of current and capital uses minus current resources and capital transfers.
4 Labour inputs	These data are not available
5 Stock of fixed assets	These data are not available

Table 4 : Production of Environmental Protection Services by NACE 90: sources and estimation methods

1. Current transactions	
1.1 Current uses	
1.1.1 Intermediate consumption	The intermediate consumption for NACE 90 is available in the national accounts by industry
1.1.4 Other taxes on production	Other taxes on production for NACE 90 is available in the national accounts by industry
1.1.2 Compensation of employees	The compensation of employees for NACE 90 is available in the national accounts by industry
1.1.3 Consumption of fixed capital	The consumption of fixed capital for NACE 90 is available in the national accounts by industry
1.1.5 Less other subsidies on production	Subsidies on production for NACE 90 is available in the national accounts by industry
1.1.6 Net operating surplus	Net operating surplus is equal to the output minus the costs of production plus the net subsidies on production
1.2. Output (cost of production)	The output for NACE 90 is available in the national accounts by industry
1.2.1 Non-environmental output	Non-environmental output is calculated by applying the share of 'other business income' in total output found for companies belonging to NACE 90 in bureau van Dijk (2002) and -(2003) to the figures found in the national accounts.
1.2.2 Environmental protection output	Environmental output is calculated by applying the share of the turnover in total output found for companies belonging to NACE 90 in Bureau van Dijk(2002) or -(2003) to the output figures found in the national accounts
1.2.2.1 Non-market	There is no non-market output
1.2.2.2 Market	The market output is equal to total environmental protection output
1.3 Current EP resources	
1.3.1 Market output (incl. Partial payments)	The partial payments are supposed not to exist
1.3.2 Current transfers	The current transfers received are estimated from the current transfers given by the other institutional sectors presented by function in the national accounts. We assume all transfers to private companies to be given to NACE 90. This means that our estimate concerning current environmental protection resources is an upper limit for this industry. Consequently, our estimate of financing by producers is a lower limit.
2. Capital transactions	
2.1.Gross Fixed Capital Formation	Gross fixed capital formation for NACE 90 is available in the national accounts by industry
2.2. Other capital uses	
2.3 Investment grants received	The capital transfers received are estimated from the capital transfers given by the other institutional sectors presented by function in the national accounts. We assume all investment grants to private companies to be given to NACE 90. This means that our estimate concerning financing by producers is a lower limit.
2.4 Other capital transfers received	
3 Financing by producers	The financing by producers is equal to the sum of current and capital uses minus current resources and capital transfers
4 Labour inputs	These data are not available
5 Stock of fixed assets	These data are not available

Table 5: Data estimation of secondary producers: Data estimation for NACE 90

1. Current transactions	
1.1 Current uses	
1.1.1 Intermediate consumption	The intermediate consumption linked to environmental protection output for NACE 60 is estimated on the basis of the share of intermediate consumption in total output for NACE 60 in the national accounts by industry (51.3, 50.5, 51.5, 54.1,54.2, 53.8 percent respectively in the years 1997 until 2002)
1.1.4 Other taxes on production	The other taxes on production linked to environmental protection output for NACE 60 is estimated on the basis of the share of intermediate consumption in total output for NACE 60 in the national accounts by industry (0.66, 0.61, 0.70, 0.58, 0.52, 0.55 percent respectively in the years 1997 until 2002)
1.1.2 Compensation of employees	The compensation of employees linked to environmental protection output for NACE 60 is estimated on the basis of the share of intermediate consumption in total output for NACE 60 in the national accounts by industry (36.0, 35.0, 35.4, 33.6, 33.9 and 35.3 percent respectively in the years 1997 until 2002)
1.1.3 Consumption of fixed capital	Consumption of fixed capital is assumed to be equal to zero, because no investment is attributed specifically to the production of environmental protection services.
1.1.5 Less other subsidies on production	Other subsidies on production linked to environmental protection output for NACE 60 is estimated on the basis of the share of subsidies on production in total output for NACE 60 in the national accounts by industry (0.84, 0.50, 0.47, 0.55, 0.36, 0.35 percent respectively in the years 1997-2002)
1.1.6 Net operating surplus	Net operating surplus is equal to the output minus the costs of production plus the net subsidies on production
1.2. Output (cost of production)	For 1997: the output is calculated on the basis of the supply table for 1995, in which we found the share of environmental protection output in total output of NACE 60 to be 0.20 percent. We then applied this ratio to total output for 1997 to obtain an estimate of environmental protection output. For 1998-2002: We used the same method, but based on the supply table for 2000. The share of environmental protection output in total output of NACE 60 was 0.07 percent.
1.2.1 Non-environmental output	In contrast to NACE 90 non-environmental output of NACE 60 is not registered because this sector is a non-specialised producer
1.2.2 Environmental protection output	All output registered is environmental protection output.
1.2.2.1 Non-market	There is no non-market output
1.2.2.2 Market	The market output is equal to total environmental protection output
1.3 Current EP resources	
1.3.1 Market output (incl. Partial payments)	The partial payments are supposed not to exist
1.3.2 Current transfers	Current transfers received are zero, because we assume all environmental transfers to private companies to be given to NACE 90. This means that our estimate concerning current environmental protection resources is a lower limit for NACE 60.
2. Capital transactions	
2.1.Gross Fixed Capital Formation	We assume all investments by NACE 60 to serve both the production of environmental and of non-environmental output. As a consequence, no specific investment for environmental output is registered.
2.2. Other capital uses	
2.3 Investment grants received	Investment grants received are zero, because we assume all environmental protection investment grants to private companies to be given to NACE 90.
2.4 Other capital transfers received	Furthermore, we assume no specific investment takes place for environmental output.
3 Financing by producers	The financing by producers is equal to the sum of current and capital uses minus current resources and capital transfers. As all output is market output, and no investment for environmental protection nor any transfers are registered, financing by producers is always zero.
4 Labour inputs	These data are not available.
5 Stock of fixes assets	These data are not available.

Table 6: Economic accounts and data estimation for NACE 74

1. Current transactions	
1.1 Current uses	
1.1.1 Intermediate consumption	The intermediate consumption linked to environmental protection output for NACE 74 is estimated on the basis of the share of intermediate consumption in total output for NACE 74 in the national accounts by industry (57.9, 57.5, 57.7, 60.2, 63.0, 62.8 percent respectively in the years 1997 until 2002)
1.1.4 Other taxes on production	The other taxes on production linked to environmental protection output for NACE 74 is estimated on the basis of the share of intermediate consumption in total output for NACE 74 in the national accounts by industry (0.38, 0.40, 0.40, 0.36, 0.33, 0.35 percent respectively in the years 1997 until 2002)
1.1.2 Compensation of employees	The compensation of employees linked to environmental protection output for NACE 74 is estimated on the basis of the share of intermediate consumption in total output for NACE 74 in the national accounts by industry (18.2, 18.5, 19.0, 18.4, 17.6 and 17.5 percent respectively in the years 1997 and 2002)
1.1.3 Consumption of fixed capital	Consumption of fixed capital is assumed to be equal to zero, because no investment is attributed specifically to the production of environmental protection services.
1.1.5 Less other subsidies on production	Other subsidies on production linked to environmental protection output for NACE 74 are estimated on the basis of the share of intermediate consumption in total output for NACE 74 in the national accounts by industry (0.52, 0.48, 0.45, 0.58, 0.47, 0.46 percent respectively in the years 1997-2002)
1.1.6 Net operating surplus	Net operating surplus is equal to the output minus the costs of production plus the net subsidies on production.
1.2. Output (cost of production)	For 1997: the output is calculated on the basis of the supply table for 1995, in which we found the share of environmental protection output in total output of NACE 74 to be 0.43 percent. We then applied this ratio to total output for 1997 to obtain an estimate of environmental protection output. For 1998-2002: We used the same method, but on the basis of the supply table for 2000. The share of environmental protection output in total output of NACE 74 was 0.68 percent.
1.2.1 Non-environmental output	In contrast to NACE 90 non-environmental output of NACE 74 is not registered, because this sector is a non-specialised producer.
1.2.2 Environmental protection output	All output registered is environmental protection output
1.2.2.1 Non-market	There is no non-market output
1.2.2.2 Market	The market output is equal to total environmental protection output.
1.3 Current EP resources	
1.3.1 Market output (incl. Partial payments)	The partial payments are supposed not to exist
1.3.2 Current transfers	Current transfers received are zero, because we assume all environmental transfers to private companies to be given to NACE 90. This means that our estimate concerning current environmental protection resources is a lower limit for NACE 74.
2. Captal transactions	
2.1.Gross Fixed Capital Formation	We assume all investments by NACE 74 to serve both the production of environmental and of non-environmental output. As a consequence, no specific investment for environmental output is registered
2.2. Other capital uses	
2.3 Investment grants received	Investments grants received are zero, because we assume all environmental protection investment grants to private companies to be given to NACE 90
2.4 Other capital transfers received	Furthermore, we assume no specific investment takes place for environmental output.
3 Financing by producers	The financing by producers is equal to the sum of current and capital uses minus current resources and capital transfers. As all output is market output, and no investment for environmental protection nor any transfers are registered, financing by producers is always zero.
4 Labour inputs	These data are not available
5 Stock of fixed assets	These data are not available

Table 7: Table B for NACE 41: Sources and estimation methods

1. Current transactions	
1.1 Current uses	
1.1.1 Intermediate consumption	The intermediate consumption linked to environmental protection output for output NACE 41 is estimated on the basis of the share of intermediate consumption in total output for NACE 41 in the national accounts by industry (24.2, 23.1, 28.6, 31.3, and 30.6 percent respectively in the years from 1998 until 2002).
1.1.4 Other taxes on production	The other taxes on production linked to environmental protection output for NACE 41 are estimated on the basis of the share of other taxes on production in total output for NACE 41 in the national accounts by industry (3.1, 3.5, 3.1, 2.2, and 2.3 percent respectively in the years from 1998 until 2002)
1.1.2 Compensation of employees	The compensation of employees linked to environmental protection output for NACE 41 is estimated on the basis of the share of compensation of employees in total output for NACE 41 in the national accounts by industry (47.4, 47.1, 43.0, 47.4, and 46.3 percent respectively in the years from 1998 until 2002)
1.1.3 Consumption of fixed capital	Consumption of fixed capital is assumed to be equal to zero because no investment is attributed specifically to the production of environmental protection services.
1.1.5 Less other subsidies on production	Other subsidies on production linked to environmental protection output for NACE 41 is estimated on the basis of the share of other subsidies on production in total output for NACE 41 in the national accounts by industry (1.6, 1.6, 0.9, 0.7, and 0.7 percent respectively in the years from 1998 until 2002)
1.1.6 Net operating surplus	Net operating surplus is equal to the output minus the costs of production plus the net subsidies on production.
1.2. Output (cost of production)	The output is calculated on the basis of the supply table for 2000, in which we found the share of environmental protection output in total output of NACE 41 to be 0.77 percent. We applied this ratio to total output in the period 1998 –2002 in order to obtain an estimate of environmental protection output during that period.
1.2.1 Non-environmental output	In contrast to NACE 90 non-environmental output of NACE 41 is not registered, because this sector is a non-specialised producer.
1.2.2 Environmental protection output	All output registered is environmental protection output
1.2.2.1 Non-market	There is no non-market output
1.2.2.2 Market	The market output is equal to total environmental protection output.
1.3 Current EP resources	
1.3.1 Market output (incl. Partial payments)	The partial payments are supposed not to exist
1.3.2 Current transfers	Current transfers received are zero, because we assume all environmental transfers to private companies to be given to NACE 90. This means that our estimate concerning current environmental protection resources is a lower limit for NACE 41.
2. Capital transactions	
2.1.Gross Fixed Capital Formation	We assume all investments by NACE 41 to serve both the production of environmental and of non-environmental output; As a consequence, no-specific investment for environmental output is registered
2.2. Other capital uses	
2.3 Investment grants received	Investments grants received are zero, because we assume all environmental protection investment grants to private companies to be given to NACE 90
2.4 Other capital transfers received	Furthermore, we assume no specific investment takes place for environmental output.
3 Financing by producers	The financing by producers is equal to the sum of current and capital uses minus current resources and capital transfers. As all output is market output, and no investment for environmental protection nor any transfers are registered, financing by producers is always zero.
4 Labour inputs	These data are not available
5 Stock of fixed assets	These data are not available

Table 8: EPEA Table B: Production of environmental Protection Services by ancillary producers : Sources and estimation methods

1. Current transactions	
1.1 Current uses	
1.1.1 Intermediate consumption	The intermediate consumption linked to environmental protection output is estimated on the basis of the share of intermediate consumption in total output in the national accounts by industry
1.1.4 Other taxes on production	The other taxes on production linked to environmental protection output are estimated on the basis of the share of other taxes on production in total output in the national accounts by industry
1.1.2 Compensation of employees	The compensation of employees linked to environmental protection output is estimated on the basis of the share of the compensation of employees in total output in the national accounts by industry
1.1.3 Consumption of fixed capital	Consumption of fixed capital linked to environmental protection output is estimated on the basis of the share of the consumption of fixed capital in total output in the national accounts by industry
1.1.5 Less other subsidies on production	Other subsidies on production linked to environmental protection output is estimated on the basis of the share of other subsidies on production in total output in the national accounts by industry
1.1.6 Net operating surplus	Net operating surplus is equal to the output minus the costs of production plus the net subsidies on production.
1.2. Output (cost of production)	
1.2.1 Non-environmental output	All ancillary output is environmental output
1.2.2 Environmental protection output	All output registered is environmental output
1.2.2.1 Non-market	Ancillary output is by definition non-market output
1.2.2.2 Market	Ancillary output is by definition non-market output
1.3 Current EP resources	
1.3.1 Market output (incl. Partial payments)	Ancillary output is by definition non-market output
1.3.2 Current transfers	Current transfers received are zero, because we assume all environmental transfers to private companies to be given to NACE 90. This means that our estimate concerning current environmental protection resources is a lower limit
2. Capital transactions	
2.1.Gross Fixed Capital Formation	Investment for environmental protection is based on the structural business survey
2.2. Other capital uses	
2.3 Investment grants received	Investment grants are zero, because we assume all environmental protection investment grants to be given to NACE 90
2.4 Other capital transfers received	
3 Financing by producers	The financing by producers is equal to the sum of current and capital uses minus current resources and capital transfers. Since we assume that the ancillary producers do not receive any transfers, the estimate is an upper limit
4 Labour inputs	n.a.
5 Stock of fixed assets	n.a.

Source: Environmental protection expenditure accounts for Belgium: 1997-2002. G. Vandille. Federal Planning Bureau, 2005.

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European System of Account 1995:
http://forum.europa.eu.int/irc/dsis/nfaccount/info/data/ESA95 /esa95-new.htm

European Central Bank glossary:
http://www.ecb.int/home/glossary/html/glossg.en.html

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European Commission

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