



System of Environmental Economic Accounting



SEEA Technical Note: Environmental Protection Expenditure Accounts (EPEA)

DRAFT: August 2, 2016

Contents

I. Introduction.....	3
II. Scope, Definitions and Classifications.....	4
Statistical units.....	4
Scope.....	4
Characteristic versus non-characteristic activities.....	5
Environmental products.....	5
Classification.....	6
III. Core Accounts for EPEA	7
Production/supply of environmental protection specific services.....	7
Producers.....	8
Expenditures for environmental protection purposes.....	8
IV. Compilation	11
Specify Needs, Design & Build	11
Collect	15
Process.....	15
Analyse.....	15
Disseminate.....	16
Evaluate	16
V. Extensions and links.....	16
VI. References.....	18
Annex.....	20

SEEA Technical Notes

This note is a part of a series of Technical Notes prepared to support the development of data based on the System of Environmental Economic Accounts (SEEA) Central Framework, the first international standard in environmental economic accounting. Since SEEA is not a single account but a series of modules, the accounts in each of the various modules can be developed separately in accordance with the priorities and the resource availability in each country.

The series of Technical Notes is comprised of one note addressing general issues that cut across domains focusing on processes and operational aspects that encourage efficient implementation of the standard and associated data compilation exercises and a number of notes on specific topics. It is recommended that those wishing to develop data related to any of these specific topics should read the general process note in conjunction with the note on the specific topic to be developed.

These notes summarize the data requirements and other operational considerations designed to provide sufficient guidance to initiate the development of the accounts. The notes also provide reference information for additional publications that will support the full development of the accounts and provide information on extensions and linkages that can be exploited once the accounts and tables are in place.

I. Introduction

1. Environmental protection expenditure accounts (EPEA) quantify the resources devoted to the environmental protection by resident economic units. They thus report the effort made by society and businesses towards implementing the ‘polluter pays principle’. To this end, the EPEA provide information on the output of environmental protection specific services produced across the economy and on the expenditure on services for environmental protection purposes.
2. This technical note provides an overview of the EPEA based on the System of Environmental Economic Accounting 2012 Central Framework (SEEA CF) which was adopted by the United Nations Statistical Commission in 2012 as the international statistical standard for environmental-economic accounts. The general purpose of SEEA Technical Notes is to summarize the key features for a given topic to support countries in the implementation of the SEEA and provide initial guidance to countries wanting to implement the specific SEEA module. The EPEA are part of the SEEA environmental activity accounts. Environmental activity accounts record the transactions in monetary terms between economic units that may be considered environmental (SEEA CF, chapter 4). Generally, these transactions concern activities undertaken to preserve and protect the environment or manage natural resources. The EPEA have links with a number of the other accounts in SEEA. The most direct links are to the Environmental Goods and Services Sector¹ (EGSS) and the Environmental Taxes and Subsidies Accounts. Expenditures for environmental purposes are also very useful in completing other accounts such as the water accounts, energy accounts and air emissions accounts.
3. The EPEA are an elaboration of the System of National Accounts in a sense that that the environmental protection expenditures are already part of the System of National Accounts but need to be separately identified. Using the structure of the sequence of accounts means that the various transactions related to environmental protection can be easily related to each other and to other transactions, following the same accounting conventions that apply in the SNA. The estimates are consistent with the estimates found in the SNA with the exception of the treatment of some own account activities which are explicitly included in the estimates for completeness of coverage of environmental activities. The EPEA are all measured in currency units and not in physical terms, unlike a number of other accounts in SEEA.
4. The general purpose of SEEA Technical Notes is to summarize the key features of accounting for a given topic to support countries in the implementation of the SEEA, and describe what might be a minimum set of information to guide initial efforts in compilation. This technical note will describe the main features of the SEEA accounts for environmental expenditures, and present a set of core accounts which comprise an adapted version of the SEEA Central Framework accounts to focus and guide initial compilation.

¹ The Environmental Goods and Services Sector as layout in the SEEA-CF approaches this topic from a different perspective, i.e. the supply of the goods and services for both environmental protection and resource management, see the technical note on EGSS.

5. The core accounts represent a minimum set of information which countries should aim to compile and report, explicitly identifying the most important data items for the module at hand. While the core accounts represent a minimum set, countries may often wish to extend the level of detail in areas deemed particularly policy relevant. The Technical Notes provide highlights of such possible extensions in the explanatory text. The level of detail and industry disaggregation of the core accounts is relatively uniform across the set of module-specific technical notes. For the modules where industry disaggregation is relevant, five broad industry classes are identified.
6. In addition to the core accounts, this technical note presents a combined presentation (see section III). This combined presentation provides countries with a template to present and disseminate an aggregated set of key information relevant to the module at hand from a range of sources (including the SEEA and SNA). The information included in the combined presentations are data items which are of key relevance to policy makers and which, often in combination, are used to calculate particularly important indicators (including the Sustainable Development Goals (SDG) indicators).
7. The development of core accounts was requested by the UN Statistical Commission at its 44th session in February 2013. The core accounts for environmental protection, along with other core accounts such as those for energy, land, and others, constitutes the starting point in the development of common reporting tables in close coordination with international agencies. They will be submitted to the UNCEEA after extensive consultations with experts, including the London Group on Environmental Accounting, international organizations and national statistical offices.
8. Section II has a brief discussion of the coverage of the EPEA and presents the core accounts. Section III describes the combined presentation for EPEA which serves to bring key information from multiple sources into one table to facilitate the derivation of basic indicators. Section IV deals with the data sets required to produce the core tables including the main concepts, data sources and compilation methods. Section V describes how the core tables and related datasets may be extended to address broader issues and links to other data sets. Section VI provides references and links to supporting material.

II. Scope, definitions and classifications

Statistical units

9. EPEA use statistical units from national accounts. Probably the most central unit used in national accounts is the so-called institutional unit which is defined as “an economic entity characterised by decision-making autonomy”. Institutional units are grouped into institutional sectors. The institutional sectors in the SNA are non-financial corporations, financial corporations, general government, households, non-profit institutions serving households, and the rest of the world.

Scope

10. The EPEA describe all environmental economic activities related to environmental protection, i.e. environmental output, environmental consumption and environmental accumulation. Environmental output is equal to the production of environmental products. Environmental consumption is equal to the intermediate consumption of environmental products by corporations

and the final consumption of environmental products by households and government. Environmental accumulation is equal to gross fixed capital for environmental protection

11. Environmental protection includes all activities and actions which have as their main purpose the prevention, reduction and elimination of pollution and of any other degradation of the environment. Those activities and actions include all measures taken in order to restore the environment after it has been degraded. Activities which, while beneficial to the environment, primarily satisfy the technical needs or the internal requirements for hygiene or safety and security of an enterprise or other institution are excluded from this definition.
12. The definition of environmental protection emphasises the purpose of the activities and actions. Experience over the years has shown that several interpretations of the concept of 'environmental' and of the determination of the purpose may exist. Compilers should know these interpretations which are described in more detail in the Annex.

Characteristic versus non characteristic activities

13. Within environmental protection activities a distinction is made between "characteristic environmental protection activities" and "non-characteristic environmental protection activities".
 - "Characteristic environmental protection activities" are those activities that directly serve an environmental protection purpose: a characteristic activity itself serves an environmental purpose (e.g. waste management activities);
 - "Non-characteristic environmental protection activities" are those activities that produce specifically designed products whose use serve an environmental protection purpose. A non-characteristic activity does serve an environmental purpose through outputs it produces (e.g. (production) of noise insulation materials).
14. Whereas EGSS accounts report both characteristic and non-characteristic EP activities, as for example the production of a waste incinerator, **EPEA focus only on the production and use of environmental protection characteristic services**; the production of these services is a characteristic activity as it directly serves an EP purpose.
15. Production activities may be executed as principal, secondary or ancillary of the corresponding production units. The principal activity of a local KAU is the activity for which the value added exceeds that of any other activity carried out within the same unit. In the EPEA reporting framework those local KAUs whose principal activity is a characteristic environmental protection activity are called specialist producers. A secondary activity is an activity carried out within a single local KAU in addition to the principal activity. The output of the secondary activity is a secondary product e.g. waste water treatment carried out by a local KAU whose principal activity is water supply.
16. An ancillary activity is an activity whose output is intended for use within an enterprise. Ancillary environmental protection activities directly serve an environmental purpose and result in products for use (other than gross capital formation) within the same establishment to support its principal and secondary activities (e.g. in-house environmental protection services such as monitoring of exhaust gas emissions, or in-house treatment of waste water).

Environmental products

17. Environmental products are the output of environmental production activities. The output

environmental protection activities can be broken down in two categories:

- **Specific environmental products:** Products which have no other use than environmental protection; examples are: septic tanks, maintenance services and other products for septic tanks, catalytic converters for vehicles, trash bags, bins, rubbish containers and compost containers, or noise protection materials whose use e.g. by households corresponds to an environmental protection purpose².
- **Cleaner products:** Products which primarily serve a non-environmental purpose but which may serve a secondary environmental purpose because they are specifically designed to be more environmentally friendly (cleaner) than normal products of equivalent use. Examples are electric or hybrid cars, sulphur-free fuels, mercury-free batteries, CFC-free products whose use e.g. by households answers to an environmental protection purpose.³

18. In the EPEA output is restricted to the specific environmental protection products, and more particularly specific environmental protection services (EP services). EP services are the output of characteristic environmental protection activities. EPEA does not cover the output of cleaner products. However, with regard to environmental consumption, in the expenditure table the use of all environmental products (i.e. specific and cleaner products) may be included.

Classifications

19. The transactions in environmental goods and services can be further disaggregated using the Classification of Environmental Activities and Expenditure (CEPA) as presented in Table 1. Note that the EPEA covers only those activities classified under environmental protection and not those classified as resource management activities.

Table 1 Classification of Environmental Activities: overview of groups and classes

Group	Classes
I: Environmental Protection (EP)	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 (excluding workplace protection)
	6 Protection of biodiversity and landscapes
	7 Protection against radiation (excluding external safety)
	8 Research and development for environmental protection
	9 Other environmental protection activities

20. Since Wastewater management and Waste management are two of the most significant environmental services in many economies, Core Account 1 asks for a three way split of two major variables – Output of environmental protection specific services and Total environmental specific services available for

² In SEEA-CF these are called “connected” products

³ In SEEA SEEA-CF calls them “adapted products” and values them at “extra costs” (see SEEA-CF § 4.76).

national uses. The requested split is CEPA 2, CEPA 3 and Other CEPA. Countries may want to consider splitting out other detail depending on the significance for national policy.

III. Core accounts for the EPEA

21. The EPEA as presented in the SEEA CF consists of four interlinked accounts. The first account presents information on the production of environmental protection specific , by resident producers. The second is a supply and use table for these specific . The third account broadens the scope of the EPEA to include products and cleaner products purchased by resident units. It also includes capital formation for environmental protection activities by characteristic activities, and relevant environmental protection transfers. The inclusion of these flows provides an estimate of the total outlays by an economy on environmental protection. The fourth account presents additional detail on the financing of the national expenditure on environmental protection.
22. Estimating and presenting data on the full set of accounts as presented in SEEA CF is a relatively challenging effort; therefore, the current note presents two simplified Core accounts that summarize key information that should form the foundation of initial efforts on EPEA. In particular, these accounts limit the coverage to environmental protection specific services initially forgoing information on cleaner products⁴. In addition, the information on transfers is limited to those to and from the rest of the world.

Production/supply of environmental protection specific services

23. The production of environmental protection specific services is presented in Core Account 1. The account shows output of environmental protection specific services and shows a range of production-related variables including intermediate consumption and value added. The intermediate consumption of these producers should be split into the intermediate consumption of environmental protection specific services and the intermediate consumption of other goods and services so that double counting can be avoided. Data on taxes and subsidies for these products completes the picture for domestic production.

⁴ However, estimates of GFCF for the purposes of environmental protection may include a wide variety of goods and services that could include cleaner products.

Core Account 1: Production/supply of environmental protection specific services (*currency units*)

	Characteristic activities			ROW	TOTAL
	Government	Corporations			
		Principal and secondary producers	own account producers		
Intermediate consumption					
Gross Value Added					
Output of environmental protection specific services					
CEPA 2					
CEPA 3					
Other CEPA					
Intermediate consumption of environmental protection specific services (-)					
VAT and other taxes less subsidies on environmental products [D221] (+)					
Imports of environmental protection specific services (+)					
Exports of Environmental protection specific services (-)					
Total supply of environmental specific services at purchasers' prices available for national uses					
CEPA 2					
CEPA 3					
Other CEPA					

Producers

24. Core Account 1 also has information on imports and exports of environmental protection services in order that a measure of total supply may be obtained. Total supply is used by economic units in the economy or may be exported. These data allow the estimation of the supply of environmental specific services available for domestic use.

Expenditure for environmental protection purposes

25. Core Account 2 constitutes an account relevant for the assessment of expenditure for environmental protection specific services. Total domestic use of environmental specific services is again broken out by the same three CEPA classes.

Core Account 2: Expenditure for environmental protection purposes

	Users			Total
	Characteristic activities		Other producers	
	Principal and secondary producers	own account producers		
Total domestic use of Environmental specific services				
CEPA 2				
CEPA 3				
Other CEPA				
Capital formation for characteristic activities				
Current and capital; environmental transfers received from the ROW				
Current and capital; environmental transfers paid by the ROW				

26. The expenditure may relate to intermediate consumption, final consumption or gross fixed capital formation. There is potential for gross fixed capital formation to be recorded for environmental

protection specific services, for example, for environmental protection research and development (R&D) (in that R&D is considered capital formation in the SNA) or in cases where the expenditure leads to improvements in land which, are treated as gross fixed capital formation in the form of land improvements.

27. In Core Account 2, all resident users of environmental protection services are included. These comprise producers of environmental protection specific services, other producers, households, general government and non-profit institutions serving households. In this account, the entries in the columns for households and general government including non-profit institutions serving households relate only to their consumption of environmental protection products. Any production of environmental protection products by these institutional sectors, including own-account production, should be included in the relevant producer column.
28. The final two rows present financing flows to and from the rest of the world which correspond to the transfers for international cooperation in the field of environmental protection. These transfers can be financed either by the government, international organizations, corporations or by households through non-governmental organizations.
29. The expenditure on capital by specialist producers and other producers required for the production of environment specific services are recorded separately. To the extent that specialist producers engage in no significant non-environmental protection activities, all of their expenditure on assets, including the purchase of fixed assets to undertake the production and the acquisition less disposal of non-produced, non-financial assets, particularly land, is within scope of environmental protection expenditure. The inclusion of all expenditure on capital formation does not apply to non-specialist or own-account producers.
30. As the gross fixed capital formation for characteristic activities by specialist, non-specialist and own-account producers is recorded in a separate row in Core Account 2, in principle, any such expenditure that includes purchases of environmental protection services should be recorded here with care not to double count these expenditures.
31. For non-specialist and own-account producers, two particular types of gross fixed capital formation for environmental protection can be distinguished:
 - (a) Investments on “end-of-pipe” technologies (also known as pollution treatment) used to treat, handle or dispose of emissions and wastes from production. This type of expenditure is normally easily identified even within the context of own-account activity because it is usually directed towards an “add on” technology which removes, transforms or reduces emissions and discharges at the end of the production process;
 - (b) Expenditure on “integrated” investments, also called cleaner technologies are new or modified production facilities designed to ensure that environmental protection is an integral part of the production process, thereby reducing or eliminating emissions and discharges in the first place and thus the need for end-of-pipe equipment.
32. These investments by non-specialist and own-account producers can be challenging to measure, as for any given enterprise large capital expenditures are likely to be infrequent and in the case of

integrated technologies, the challenge of estimating the proportion used for environmental services can be substantial. For this reason, initial compilation should focus on specialist producers.

IV. Combined Presentation and Aggregates / Indicators for EPEA

37. The Combined presentation for EPEA provides the essential information from the EPEA accounts along with data from the SNA that can be used to inform policy and develop related indicators.
38. The development of time series for these data provides the primary indicators as policy makers are interested in the growth of these expenditures relative to overall economic activity and environmental policies.

Combined presentation for EPEA

	Users				Total	
	Industry		Households	General government & NPISH		
	Producers of Specialist and Non-specialist	Own-account producers				
Environmental protection specific services	NI	4 000	3 500	2970	1800	12 270
Wastewater management						
Waste management						
Other environmental protection activities						
Capital formation for characteristic activities	2 100	2 500				4 600
Environmental protection transfers to and from the rest of the world (net)					200	200
Total national expenditure on environmental protection	2 100	6 500	3 700	3 570	2 000	17 870
Of which selected CEPA classes, e.g.						
Wastewater management						
Waste management						
Other environmental protection activities						
Capital formation - total	2 100	12 026	144 300			158 426
Gross Value Added	10881	62312	746698			819891

39. The table provides the basis for the following indicators:

- Level of national expenditure on environmental protection by sector
- Share of national expenditure by value added
- Information on environmental transfers with the rest of the world
- Within what environmental area are the expenditures focusing on?
- Changes in trends

These indicators provide information on the resources the economy is dedicating to environmental protection and which institutional sectors are using these environmental products.

40. The table also allows a decomposition of these expenditures into those directed to investment in future capacity to produce environmental products and those for current use. The information on investment patterns may be very important in the early stages of policy development in some cases.

V. Compilation

33. The compilation of SEEA accounts should be founded on the GSBPM as outlined in the first note in this series “Statistical Production Processes for Implementation of the SEEA-Central Framework”.

Overarching Management Functions							
1 Specify Needs	2 Design	3 Build	4 Collect	5 Process	6 Analyze	7 Disseminate	8 Evaluate

Specify Needs, Design & Build

34. It is often the case when building accounts (SEEA or SNA for example) that one of the goals is to use existing data sources as much as possible. In such a case, the Specify Needs, Design and Build phases will often need to be undertaken simultaneously and iteratively, as one evaluates the capacity of existing data sets to meet needs relative to the potential costs of initiating new data development.
35. Since the role of protecting the environment is organized differently across nations, the first step in developing an EPEA is to document these responsibilities in one’s country. The organizations with these responsibilities will be important in determining the data needs but may also have expertise and existing data sources that can support the development of the accounts.
36. These initial steps may not need to be undertaken for each data cycle but should be revisited periodically in conjunction with longer term planning cycles.
37. Consult with policy makers, stakeholders and potential data providers on the environmental protection activities of interest for the country. Consider links to other environmental data initiatives planned or underway that could be potential data sources or provide guidance in classifying or identifying environmental protection expenditures (EGSS for example). Setting out the specific activities that would be of interest to the information needs of the country should be done at this stage. This will provide a basis to examine the adequacy of the existing data and assess where additional information may be required.
38. It will be important to find the appropriate balance between the detail sought by policy makers and analysts and the capacity of the statistical infrastructure to deliver sufficiently robust estimates particular in the early stages of development. However, it is also important to recognize the

demands for detailed estimates so that the development of data sources and systems can anticipate eventual improvements in these dimensions.

39. Some activities and products such as operation of the waste water treatment system or waste management and associate services (ISIC 37-39) will be totally within scope for EPEA. However, since these activities are often the responsibility of local governments, either directly delivered or contracted out to the private sector, there may be a wide variety of practices with regard to some aspects of these environmental protection activities. For example, financing of such facilities can vary widely across jurisdictions.
40. Identify potential data sources and assess their suitability for estimating the desired variables for the full range of EPEA activities. They can e.g. be found in the national accounts or the economic statistics feeding into the accounts, both the production account, but also government financing are important sources. In this step the metadata associated with the data sources should be closely examined to assess coherence between data sources and consider where methodologies for differences in concepts, coverage (including units of observation), timing and classification will be required.
41. The activities of specialist producers as defined for EPEA is best approached from the supply side given their entire output is part of EPEA production. However, for other producers, households and government a demand side approach may be required. Many of the efforts to estimate EPEA have been based on using proxies from other data sources to estimate ratios that are applied to national accounts information.
42. Business associations may be a source of producers of environmental services. Contacting the association may provide access to lists of members or the associations may be prepared to use its own expert knowledge of sector activities to identify major producers and products relevant for the economy. They also often have knowledge of patterns of international trade and also which activities or products are not significant for the particular economy.
43. Identification at the entity level may also allow the use of micro data linking techniques. This may allow the linking of data across survey and administrative data sets to provide new detailed data categories.
44. Detailed national accounts estimates and the data sets that support these should be examined for their potential to provide EPEA data. However, in many case the detail will not be sufficient to identify environmental protection activities. One case where detailed data may exist is in government financial data given the growing interest and focus on these activities by many governments.
45. Administrative data on environmental protection activities and regulation may also provide sources for some aspect of environmental protection. Increasingly individual businesses and industry associations are highlighting members' activities related to environmental activities and these reports may provide ratios such as portions of activities or full time equivalent activity that can be used to estimate the associated values. These should be explored before any additional data collection is pursued.

46. For specialist producers identifying units on the business registry that are producing environmental protection services should be considered. It may also be useful to identify producers with secondary products that make a significant contribution to environmental protection. Canada, for example, provides the capacity to record program specific attributes that are linked to entities on the business register for targeted data collection activities.

Government sector

47. The main source of data for the Government sector is national accounts – general government expenditure by function (COFOG) and in particular items classified in COFOG 5. Analysis of financial budgets and accounts analysis is useful for detailing EP expenditure activities already recorded in a more aggregated way under COFOG statistics (e.g. to split up COFOG 5.3). The calculation of more detailed data for some variables may require appropriate estimation techniques, for example in the case of consumption of fixed capital which could be estimated from data on investments or from data available from national accounts using appropriate ratios.

48. One of the functions (division 05) of the COFOG is environmental protection. The breakdown of environmental protection is based upon the Classification of Environmental Protection Activities (CEPA). The table below shows the relationship between the groups of the COFOG’s division 05, CEPA classes and gives some indications on the corresponding ISIC classes (even though not 100% of the indicated ISICs correspond to the respective COFOG / CEPA: there cannot be a perfect match between COFOG / CEPA (purpose) and ISIC (product characteristics, processes, technology) classifications.

COFOG 05 (Environmental Protection)	CEPA 2000	ISIC
05.1 Waste management	3. Waste management	381; 382; 39; 8129
05.2 Waste water management	2. Wastewater management	37
05.3 Pollution abatement	1. Protection of ambient air and climate	39
	4. Protection and remediation of soil, groundwater and surface water	39
	5. Noise and vibration abatement	4329; 7120
	7. Protection against radiation	3812; 3822
05.4 Protection of biodiversity and landscape	6. Protection of biodiversity and landscapes	9104
05.5 R&D environmental protection	8. Research and development	72
05.6 Environmental protection n.e.c.	9. Other environmental protection activities	8412; 9499

49. Environmental data sets used for other SEEA accounts may provide information on production of environmental goods and services. Also, economic data programs may provide some data of use for the identification of these activities.
50. Finally, adding questions to existing surveys or developing new surveys may be required. However, care should be taken as the distribution of environmental expenditures may be distributed widely and not well correlated with other activity thus making surveying challenging. This may be particularly true for capital investment where expenditures can be widely dispersed with timing tied to the more general investment decisions of the firm or highly concentrated in response to government initiatives.
51. When first setting up an EPEA account, care should be taken to not be overly ambitious. Finding or collecting data for non-specialized producers with only small production values may prove very costly. It is advisable to focus on major producers and products in the initial development and then improve the estimates as experience with the account is acquired.
52. It is important to thoroughly assess the metadata for the available datasets. First, assess whether or not the definitions conform to and/or support those set out for the required activities in the design stage. If not, is the shortcoming important or can it be overcome with estimates based on alternate sources? Also, key at this stage is to clearly ascertain the classification, conceptual and coverage differences across the various data sets to be used as basic inputs.
53. Assess if there are readily available concordances between the classification systems and if there are reliable sources that can be used to estimate adjustments for conceptual and coverage difference. Complete concordances generally do not exist for the types of activities covered by EPEA.
54. At this point, if sufficient basic data is not available to produce estimates for one or more important production of environmental services, it may be necessary to initiate a project to establish a new source of data. This may mean that the development of the sector splits into two paths: one that can provide partial coverage with existing data and one where development would have to await the availability of basic data.
55. In some cases where partial data exist but there are some important data gaps, it may be a good idea to construct a preliminary set of estimates based on related flows or modelling to fill the gaps. This could be done to aid in the development of the missing basic data.
56. In the case where basic data must be developed, it is recommended that a separate project be initiated to develop the necessary data. This project should follow the GSBPM steps and generic principle as set out in the first note in this Technical Note series. Depending on the organization of responsibilities within the statistical infrastructure of the country, this step may involve additional agencies or sectors of the NSI.
57. Secure access to data, associated metadata and the rights to disseminate the estimated variables that are derived from that data. Where needed, obtain access to expertise in organizations from which data is being sought to assist with analysis and/or training.

58. SEEA compilers will at an early stage need to ensure access to these data if sharing agreements do not already exist. The terms of access under current institutional arrangements are key. The terms should support cooperative working arrangements and the release of data with sufficient detail to address the policy issues important for the country.
59. This step can take considerable effort and time in cases where institutional arrangements are not yet established. It will be important for all agencies involved to clearly appreciate the mandate of the other agencies and associated constraints.
60. It is important to make other compilers, both those responsible for other environmental data and economic compilers such as those for the national accounts, aware of the data requirements for these types of activity accounts and to encourage them to enhance their datasets and systems to support the ongoing production of EPEA data.
61. Establishing and maintaining good working relations with the agencies that are the source for basic data can pay dividends later in the production process when estimation challenges require expertise to overcome.
62. Set out a plan for the progressive implementation of EPEA based on the availability of resources and basic data.
63. Databases for the basic data and the associated accounts must be established. Given the SEEA links to the SNA, existing database structures and associated processing systems may be a good source for this development. Some adjustments will be required to add components not in the SNA such as intra-enterprise flows.
64. Use of the same systems and processes will facilitate aligning of data sets and should help reduce the development costs for the new accounts and facilitate the integration of data for the production of indicators. At least systems should be aligned such that datasets from various system can be easily integrated.

Collect

65. Import data and process data including applying concordances that may be required between the classifications used in the imported data and the classifications to be used in the estimates.
66. The fact that in many cases the environmental expenditures are parts of broader categories of activity will require that metadata and detailed adjustment/estimation approaches be collected and retained in common databases. These databases should also allow easy linking with standard data sets for related domains so that verification and confrontation of data is facilitated.
67. Given that data may be acquired from a number of institutions or agencies, it is important to establish standard data transfer protocols. Invariably agencies require changes/upgrades to systems and these may impact data integration if protocols are not in place. It is also important to collect metadata with each period or at least verify that it has not changed so as to be aware of any changes to classification, definitions, etc.

Process

68. Prepare estimates, including the estimation of data for any data gaps. Given the use of proxies to estimate some data and the varying quality and coverage of these, it is likely that different methods will need to be considered for each industry/sector of the economy.
69. As noted earlier, caution must be taken not to double count expenditures in the case of specialist producers, thus it is important to estimate Core Account 1 first and to address this potential for double counting.
70. Once all required variables have been derived, they should be put into a common format and confronted with existing data from other sources such as the SNA, Business association outputs or measures from other departments or agencies. Evaluation of the estimation methods should be considered at this time, particularly when new accounts are being developed.
71. In the case of EPEA, this is particularly important that the data on financing of the expenditures be confronted with the data on expenditure to assure reasonableness.

Analyse

72. Analyse tables and graphic representations including undertaking an analysis of time series where possible and recognising the likely need for multiple iterations of this and the previous step. Data quality should be assessed and documented at this stage.
73. The steps in the above three paragraphs are the core activities in building the estimates and will be repeated in cycle during each production period. This allows the strength of the accounting approach to be used to confront the various data sources and check for consistency and reasonableness in comparison to other datasets such as the related national accounts values.
74. The first time accounts are estimated for a new program, particular attention needs to be made with regard to adjustments required to the source data to ensure the methods used are appropriate and sound. Given that proxy data and ratios are likely to be used for these estimates, the reasonableness of the initial estimates needs to be thoroughly assessed.
75. It is recommended that in cases where significant basic data come from other agencies, the staff of those agencies be asked to participate in the analysis of the estimates. These experts often have in depth knowledge that can allow the identification and resolution of inconsistencies.

Disseminate

76. Disseminate estimates, including material to assist interpretation (e.g. indicators, methodological notes and statements of data quality.)
77. The dissemination of data should always be accompanied by sufficient documentation and metadata to allow users to fully understand the information being disseminated. This is particularly important for the initial dissemination of a new program of data where one might want to identify the initial data as 'experimental' or 'preliminary' and make it clear that user input is being sought in order to improve future releases.

Evaluate

78. Archive data and related methodological and other documentation. Review estimates, data sources, methods and systems, including actively seeking user feedback.
79. These last two steps are very important for all statistical programs but when initiating a new program of data, seeking user feedback is crucial. This in turn depends on the existence of good documentation on the methods and systems so as to properly inform users and assess their feedback.

VI. Extensions and links

80. The table in Section II provides information for all environmental activities. It may be beneficial to split out the expenditure for some specific activities as defined in Annex 2 or even more detailed classes described in the Annex to SEEA-CF. This would allow more targeted indicators to be calculated which may be important if policy actions are focusing on some specific environmental issues.
81. Likewise, it may be interesting to break out the estimates for some specific industries that are of particular interest, particularly for the specialist activities.
82. As mentioned, links with other SEEA accounts should also be identified as much as possible. For example the identification of transfers, including subsidies, can be linked to the Taxes and Subsidies Accounts.
83. While this note recommends initial efforts for EPEA focus on the two simplified accounts described above, opportunities should be sought to extend the accounts to the full set of accounts described in SEEA-CF.
84. Finally, it should be noted that with the heightened interest in environmental and sustainable development issues, there is considerable technological progress in product development for this domain. It will be important to update product and services lists on a regular basis. Again, maintaining strong working relationships with other agencies can be useful in this regard.

VII. References

SEEA-Central Framework (UNECE 2013 edition):
http://unstats.un.org/unsd/envaccounting/White_cover.pdf

1. SNA 2008: System of National Accounts
<https://unstats.un.org/unsd/nationalaccount/sna2008.asp>

Eurostat:

- Statistics Explained: http://ec.europa.eu/eurostat/statistics-explained/index.php/Environmental_protection_expenditure
- [EU-27 Environmental Protection Expenditure increased to 2.25% of GDP in 2009](#) — Statistics in Focus 23/2012
- [Energy, transport and environment indicators pocketbook, 2014](#) — Statistical pocketbook, 2014

Handbooks:

- [Environmental expenditure statistics: General Government and Specialised Producers data collection handbook, 2007](#)
- [Environmental expenditure statistics: Industry data collection handbook, 2005](#)
- [OECD/Eurostat Environmental Protection Expenditure and Revenues Joint Questionnaire/SERIEE Environmental Protection Expenditure Account: Conversion Guidelines, 2005](#)
- [SERIEE — Environmental protection expenditure accounts - Compilation Guide, 2002](#)
- [SERIEE — European System for the collection of economic information on the environment, 1994 version](#)

National studies:

[Australian bureau of Statistics \(2014\): Towards an Environmental Expenditure Account, Australia](#)
<http://abs.gov.au/AUSSTATS/abs@.nsf/ProductsbyCatalogue/B1F37803A00F845ACA257D2B00131763?OpenDocument>

[National Institute of Statistics, Romania \(2014\) Environmental accounts: Environmental protection expenditure accounts \(EPEA\), Air emissions accounts \(AEA\), Environment industry accounts \(EGSS\)](#)

[Statistics Norway \(2013\) Environmental protection expenditure accounts \(EPEA\)](#)

More national reports available in link:

<http://ec.europa.eu/eurostat/documents/1798247/6079569/Catalogue-of-pilot-study-reports-09-12-2014.xls>

Examples of dissemination of statistics, country level:

Instituto Nacional de Estadística:
<http://www.ine.es/jaxi/menu.do?type=pcaxis&path=/t26/p067/p02/prot/&file=pcaxis&L=0> (In Spanish and English)

Statistics Sweden:
http://www.scb.se/en_/Finding-statistics/Statistics-by-subject-area/Environment/Environmental-accounts-and-sustainable-development/Environmental-protection-expenditure/ (in Swedish and English)

Statistisches Bundesamt:
https://www.destatis.de/DE/PresseService/Presse/Pressemitteilungen/2014/12/PD14_458_325.html (In German and summary in English)

Annex

Environmental protection includes all activities and actions which have as their main purpose the prevention, reduction and elimination of pollution and of any other degradation of the environment. Those activities and actions include all measures taken in order to restore the environment after it has been degraded. Activities which, while beneficial to the environment, primarily satisfy the technical needs or the internal requirements for hygiene or safety and security of an enterprise or other institution are excluded from this definition.

What are environmental protection activities?

In general, according to ESA 2010 (paragraph 2.145) “an activity occurs when resources (...) are combined, leading to the creation of specific goods or services. An activity is characterised by an input of products, a production process and an output of products”, whereby “production is an activity carried out under the control, responsibility and management of an institutional unit that uses inputs of labour, capital and goods and services to produce outputs of goods and services” (paragraph 3.07).

These guidelines define “environmental protection activities” as follows: environmental protection activities are activities that either directly serve an environmental protection purpose or produce specifically designed products whose use serve an environmental protection purpose.

The definition of environmental protection emphasises the purpose of the activities and actions. Experience over the years has shown that several interpretations of the concept of ‘environmental’ and of the determination of the purpose may exist. Compilers should know these interpretations which are described in the box below.

Box 1. Environmental purpose

The environmental protection purpose criterion has a central function delimitating the scope of the EPEA. The criterion requires a special explanation because it involves a degree of subjectivity, changes over time and may be not fully comparable across countries.

To identify environmental activities the SEEA-CF 2012 (section 4.2) proposes to use the primary purpose criterion, recognising that many economic activities are undertaken for a variety of purposes, environmental and non-environmental ones.

Several interpretations of the primary purpose criterion are possible, e.g. as follows:

- purpose in a narrow sense, i.e. the real dominant intention or objective of actors;
- purpose based on legislation;
- purpose based on revealed intentions, i.e. policy statements or declarations of respondents.

Real dominant and revealed intentions may be difficult to observe or measure and in practice, an environmental purpose may be also identified through the following criteria:

- technical nature, i.e. the objective nature of the activity irrespective of legislation or revealed intentions;
- presumed effect, i.e. assumed environmental consequences of an activity or action;
- real effect, i.e. the objectively proven consequences on the environment of an activity or action.

In these guidelines, the principal basis for determining the environmental purpose of an activity is the technical nature. It determines whether or not the activity is suitable to reduce the pressure on the environment, through prevention, reduction and elimination of pollution, whatever the stated motivations and presumed or real effects are.

This criterion also applies to services that support environmental protection activities and the use of environmental protection products (administration, education, training, information and communication services) as well as to environmental protection research and development activities.

From a statistical point of view, the technical nature is the most neutral basis for determining the environmental purpose. In fact it allows checking the purpose of production activities by considering the suitability from a technical perspective of various goods and services for achieving the environmental purpose, whatever the motivation of the agent that produces it.

The technical nature is related to some evaluation of the presumed or real environmental effect of the use of the product. While the real environmental effect of a product can only be determined through complete life-cycle analysis, which is mostly not available, the presumed effect can serve as a supplementary indication of purpose.

Characteristic environmental protection activities and products

For the purpose of EPEA it is important to distinguish between “characteristic environmental protection activities” that directly serve an environmental protection purpose and “non-characteristic environmental protection activities” that produce specifically designed products whose use serve an environmental protection purpose (Eurostat 2015b).

Whereas EGSS Accounts report the results of both categories of environmental activities, EPEA are dedicated to the reporting of output and gross fixed capital formation of characteristic environmental protection activities, as well as to the reporting of the uses of environmental protection characteristic services.

Output of characteristic environmental protection activities are (characteristic or specific) environmental protection services (EPS). Units that carry on characteristic environmental protection activities are called characteristic producers.

Characteristic environmental protection activities may be carried either as principal, secondary or as ancillary activities.

In national accounts the classification of producers (local KAUs) by industries is based on the principal activity of the local KAU.

The principal activity (see ESA 2010 paragraph 3.10) of a local KAU is the activity where the value added of such activity exceeds that of any other activity carried out within the same unit. In the EPEA reporting

framework those local KAUs whose principal activity is a characteristic environmental protection activity are called specialist producers.

Characteristic environmental protection activities may also be carried out by local KAUs as secondary activity: a secondary activity (see ESA 2010 paragraph 3.11) is an activity carried out within a single local KAU in addition to the principal activity. The output of the secondary activity is a secondary product (e.g. waste water treatment carried out by local KAU whose water supply is the principal activity).

Environmental protection activities can finally be ancillary activities of a unit. An ancillary activity (see ESA 2010 paragraph 3.12) is an activity whose output is intended for use within an enterprise. Ancillary environmental protection activities directly serve an environmental purpose and result in products for use (other than gross capital formation) within the same establishment to support its principal and secondary activities (e.g. in-house environmental protection services such as monitoring of exhaust gas emissions, or the in-house treatment of waste water).

Non-characteristic environmental products

Non-characteristic activities are not covered by EPEA, although the use by households of non-characteristic environmental products may be reported on a voluntary basis. For the purpose of EPEA non-characteristic products cover two categories of products:

The first category of these products corresponds to the products which have no other use than environmental protection⁵; examples are: septic tanks, maintenance services and other products for septic tanks, catalytic converters for vehicles, trash bags, bins, rubbish containers and compost containers, or noise protection materials whose use e.g. by households corresponds to an environmental protection purpose. In the SEEA CF these products are called “connected” products.

The second category of these products corresponds to products that primarily serve a non-environmental purpose but which may serve a secondary environmental purpose because they are specifically designed to be more environmentally friendly (cleaner) than normal products of equivalent use⁶. Examples are electric or hybrid cars, sulphur-free fuels, mercury-free batteries, CFC-free products whose use e.g. by households answers to an environmental protection purpose. In the SEEA CF these products are called “adapted or cleaner” products.

⁵ Called non-characteristic primary purpose products in “integrating the monetary environmental accounts” ENV/EXP/WG/01(2015) Working Group Environmental Expenditure Statistics, March 2015

⁶ Called non-characteristic secondary purpose products in “integrating the monetary environmental accounts” ENV/EXP/WG/01(2015) Working Group Environmental Expenditure Statistics, March 2015