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

Integrated framework for environmental activity accounts

Eurostat

Executive summary

This note proposes an integrated framework for the environmental activity accounts which address environmentally beneficial products or environmental activities or related economic flows. Other accounts about environmental harmful products are not integrated. The integrated framework is articulated around three elements, namely: a common set of concepts and terms for all the accounts in the framework, the list of features (variables, valuation rules and main classifications) for each account, and a set of tables which link between the accounts.

The main changes as compared with the SEEA CF chapter IV are: first, a unified terminology for all the accounts. This brings no changes to definitions of environmental accounts, but there is a turning point for some environmental products; in particular concepts such as adapted goods and connected goods are discontinued and there are new concepts cleaner products and resource-efficient products, which are unified for all the accounts. Secondly, the redundancies and overlaps between accounts (e.g. output in EGSS and EPEA) are removed, providing clarity for users and efficiency gains for compilers. Tests on efficiency gains are currently ongoing in some European countries and more tests should continue. The tests are not expected to question the conceptual framework. Thirdly, a few variables are valued differently; in particular a double valuation at full costs and extra costs is proposed for cleaner and resource-efficient products. This is to facilitate balancing of supply-demand and for different types of analysis. Lastly, the new set of tables linking between the accounts provides transparency and guidance for producers and users alike.

1. Background

SEEA CF chapter IV is devoted to environmental activity accounts and related flows, also known as monetary environmental accounts¹. These record transactions in monetary terms between economy units that may be considered environmental (SEEA CF § 4.1). There is not one single SEEA environmental activity account but many, and they address the domain from a specific angle or with a specific focus.

Unfortunately, these accounts are presently not well integrated with each other. Their scope, concepts, definitions, valuation rules and classification groupings are not always identical or consistent across them. This is also acknowledged in the SEEA CF: discrepancies between Environmental goods and services sector account (EGSS) and environmental protection expenditure account (EPEA) are mentioned and discussed in §§ 4.6, 4.32, 4.33, 4.42, 4.101 and the whole section 4.3.4. There are redundancies and gaps. Some results are hard to reconcile. The same term has different meanings for different accounts, e.g. 'adapted product'. Moreover these 'accounts' are not always well embedded in an accounting structure, in the

¹ SEEA CF uses the term *environmental activity accounts and related flows*. In Europe, the term *monetary environmental accounts* is used more or less with the same meaning. This document adopts the SEEA CF terminology.

sense of SNA. This situation is due to historical and other factors which are not explained here.²

Correspondingly, the research agenda of the SEEA CF has one research area for an *integrated framework* for the environmental activity accounts. This is the purpose of this document. This note proposes an integrated framework for environmental activity accounts. This document was developed by Eurostat, the lead agency on this SEEA CF research agenda topic, based on extensive consultations with international experts: discussions in the Eurostat working group since 2013, in the London Group of experts and most recently one meeting of experts which took place in March 2018 to advise the SEEA CF technical committee.

Actually, the goal has been reframed to produce an integrated framework for *some* of the environmental activity accounts referred in SEEA CF chapter IV, rather than for *all*. There are two main categories of environmental activity accounts. A first one is *those environmental activity accounts which address environmentally beneficial products (i.e. environmental goods and services) or environmental activities or related economic flows (such as production, consumption, investment, financing, jobs and salaries) or economic units involved in those flows (e.g. environmental producers)*. A second type of environmental accounts addresses other types of flows linked to environmentally harmful products or activities, for instance accounts on environmental taxes (which are actually about taxes on environmentally harmful products), subsidies on fossil fuels, potentially environmental damaging subsidies, etc.

Therefore this document proposes *an integrated framework for the first type of environmental activity accounts*, i.e. those concerned with environmentally beneficial products, activities and related flows. This is so because those accounts have the same universe of study and need a common set of definitions and concepts (about environmental activities and products), coordination about their scope and contents, and a common accounting structure. In particular, this document addresses the integration of the following four accounts:

1. Environmental goods and services sector account (EGSS)
2. Environmental protection expenditure account (EPEA)
3. Resource management expenditure account (ReMEA)
4. Environmental subsidies and other transfers account (ESST)

The second type of environmental activity accounts are not required the same level of integration, albeit they can benefit from using some concepts or classifications from the integrated framework. This second type of environmental activity accounts are part of the SEEA CF too, which ensures they are part of the same standard.

Yet another point of consideration is how the environmental activity accounts in the integrated framework relate to physical environmental accounts in the SEEA CF, and whether they all need to be further 'integrated'. This note claims that there is no need for it. This point is already ensured by the common SEEA CF standard and the same accounting tools such as (monetary and physical) supply-tables with the same underlying definitions (e.g. what's

² For reference see Eurostat Working Group document ENV_MESA_WG_2017_03 or Eurostat document for the 2017 meeting of the London Group of Experts.

production, what's exports) and classifications (e.g. ISIC). Moreover, SEEA CF chapter VI is devoted to integrating and presenting the accounts. However, admittedly, much remains to be done about the *common exploitation, analysis and dissemination* of environmental activity accounts and physical environmental accounts, e.g. to link how the physical flows of energy relate to the jobs in the sector, the influence of shift in taxation or the effects on reducing air emissions.

The structure of this document is as follows: section 2 presents the overview of the solution proposed, which consists of three elements or parts, namely a common set of concepts, the features for each account in the framework, and a set of tables linking the accounts. Each one of those three parts is presented in sections 3 to 5. Finally, section 6 presents some explanations about environmental activity accounts which are not part of the integrated framework.

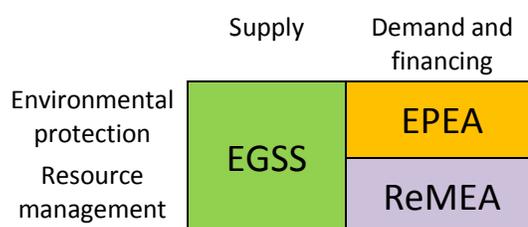
2. Overview of the integrated framework

In line with the modular structure of SEEA CF, in which each thematic account is a module, the integrated framework is constituted by several activity accounts, each one being a module independent from the others but fitting tightly together. ‘Fitting tightly’ means that the modules are part of a single, bigger conceptual framework that is embedded and fully consistent with the SNA; variables and aggregates produced for one account can be re-used in another account with no adjustments or with a few, well-defined adjustments e.g. for valuation. The accounts are specialised and complementary.

Because of the modular structure, national compilers can choose to compile only one module or several ones, according to their national circumstances and preferences. They are not required to compile them all although there are economies of scale in doing so.

In the integrated framework, EGSS focuses on the supply of environmental products, EPEA focuses on demand and financing of environmental protection and ReMEA focuses on the demand and financing of resource management. The ESST account supports EPEA and ReMEA by providing details on financial flows with regard to environmental activities.

Figure 1: Integration of EGSS, EPEA and ReMEA



One may wonder whether EPEA and ReMEA should be merged into one single account (otherwise said, one single box in Figure 1). Conceptually it would make sense. However this is currently problematic for compilation reasons, as the information available for ReMEA is much scarcer than for EPEA. For the moment it is proposed to keep EPEA and ReMEA separate. The expenditure side would therefore consist of two twin parts with different level

of ambition, one for EPEA (more detailed) and one for ReMEA (less detailed) but sharing common specifications as to interconnect with EGSS.

The integrated framework is articulated in three elements as follows:

- I. A common set of concepts and definitions with harmonized terminology for the accounts in the integrated framework. This is presented in section 3.
- II. A set of specific *features* for each account, well defined and coordinated with the other accounts in the framework. *Features* mean the scope of each account, variables, valuation rules and main classifications used. The set of features proposed for each account are presented in section 4.
- III. A set of tables which link between the accounts in the integrated framework. This is explained in section 5.

3. Common set of concepts and terminology

This section presents the concepts and terminology for all the activity accounts in the integrated framework. In a modular structure, it is essential to have unified terminology. It must be avoided that the same concept or term has different meanings in two accounts, or conversely that two names exist for the same concept.

3.1. Environmental activities³

SEEA-CF §4.11 states that environmental activities encompass two types of activities, namely whose primary purpose is to:

- reduce or eliminate pressures on the environment. These are called **environmental protection activities**
- make more efficient use of natural resources. These are called **resource management activities**

Environmental protection activities (EP activities) are defined according to SEEA-CF (§ 4.12) as 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. **Resource management activities** (RM activities) are defined (SEEA-CF § 4.13) as all activities and actions which have as their main purpose preserving and maintain the stock of natural resources and hence safeguarding against depletion. Activities that are neither EP nor RM are **non-environmental activities**. These are outside the scope of environmental activity accounts. They are, for instance, 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. See e.g. SEEA CF section 4.2.3.

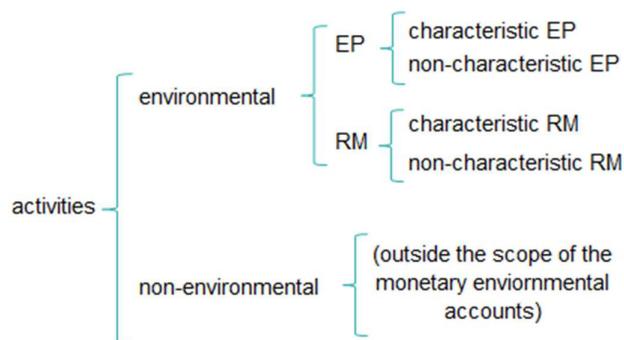
The identification of environmental activities requires an analysis of the main purpose of the activities and actions. This is challenging and national compilers frequently ask for further guidance. The Eurostat guidance is to consider the *technical nature* of the economic activity, as opposed to presumed effect, purpose laid down in legislation, etc. (see [Eurostat EGSS handbook ed 2016](#), Box 1 on pg 13). In spite of guidance about the technical nature of the environmental purpose, for actual operation procedures many countries use operational lists of environmental activities and products. These can be considered a practical tool based on the guiding principles of the purpose.

Environmental activities encompass both activities that directly serve an environmental purpose (also called **characteristic environmental activities**) and activities which do not directly serve an environmental purpose but which produce specifically designed products whose use serves an environmental purpose (also called **non-characteristic environmental activities**). National compilers may wish to distinguish between characteristic and non-characteristic environmental activities for compilation purposes, but this is not an essential

³ No change is proposed for the definitions of environmental activities from those in SEEA CF §§4.11-4.15. This section is included for completeness

feature of the integrated framework.^{4 5} Such distinction may be useful, e.g. for national compilers which use dedicated surveys to measure the economic activity of producers engaged in characteristic environmental activities and complement with a product-by-product approach for the non-characteristic activities.

Figure 2: Categories of activities



Environmental activities can be market or non-market or for own final use. These are concepts from national accounts (see SNA §§6.95ss). Environmental activities can be principal or secondary or ancillary activities of the corresponding production unit (see SNA §5.8-5.10). In particular, ancillary environmental activities are supporting activities undertaken within an enterprise in order to create the conditions within which the principal or secondary activities can be carried out. Ancillary environmental activities are important because the environmental activity accounts record them more explicitly than national accounts e.g. in-house environmental protection services such as monitoring exhaust gas emissions.

3.2. Environmental producers; specialist producers

The environmental activity accounts in the integrated framework study the *production* of environmental products as well as the *consumption*, *investment* and *financing* of those products and other economic transactions related to them. Those economic functions are performed by economic units. Two types of statistical units are involved in those transactions, one of them specific for production activities. SEEA CF uses for statistical units the conventions of SNA.

⁴ The term ‘characteristic’ has been used with different meanings in handbooks, creating some confusion. Indeed SNA 2008 Chapter 29 ‘satellite accounts’ uses this term, but always for characteristic *products*, and with a meaning not identical to here. This document reserves the term ‘characteristic’ for activities, and does not use it for products nor producers. This is a deliberate effort to put distance between ‘characteristic activities’ and ‘characteristic products’, because e.g. producers engaged in characteristic environmental activities may also have secondary non-environmental production, and the corresponding products are thus not ‘characteristic’.

⁵ The non-characteristic environmental activities have a role in the integrated framework somehow similar to the connected products in the SNA (para 29.60), but they are not defined in the same terms and therefore are not comparable nor can they be mapped one into another.

For purposes of studying economic behaviour in general, the central statistical unit in national accounts and in environmental activity accounts is the **institutional unit**, which can engage in the full range of transactions and are capable of owning assets and incurring liabilities on their own behalf (SNA §2.16). Institutional units are not considered isolated but in groups of units with a similar type of economic behaviour. They are called **institutional sectors** (SNA §2.17).

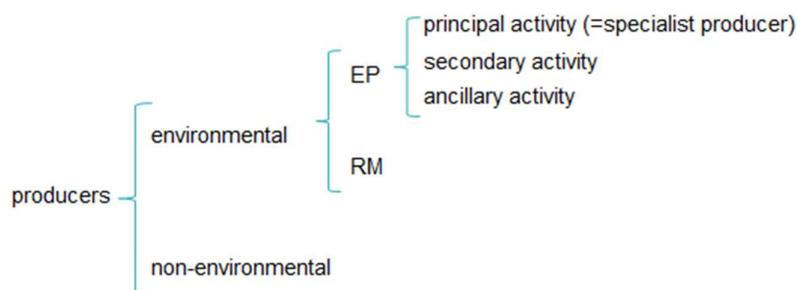
For purposes of analysing production, institutional units are divided/decomposed into smaller units which are more homogenous with regards to the various production activities and location. These more homogenous units are called **establishments** (SNA §2.38). Establishments do not necessarily have decision-making autonomy as they may be part of a larger institutional unit who has the decision-making.

Ideally, environmental accountants would work with fully homogeneous statistical units, in such a way that production units engaged in environmental activities only perform environmental activities and only produce environmental products. In such an ideal world there is perfect 1:1 correspondence between environmental activities, environmental producers and environmental products. Unfortunately, in reality, units engaged in environmental activities may also produce non-environmental products, and conversely units engaged in non-environmental activities may produce environmental products, and a distinction is needed. This means, for instance, that the exports of units engaged in environmental activities are not the same as the exports of environmental products. The figures are different and it may be costly or impossible to reconcile them. This has profound consequences, not fully spelled out in some frameworks, e.g. SNA. It is for this reason that this document has definitions for environmental *activities*, *products* and *producers*. For instance, some countries, due to their national circumstances, favour an estimation approach based on products. This may be because they can more easily capture environmental products than activities. Some countries rather favour an estimation approach based on activities instead of products, for practical reasons or for interest or design, e.g. if national policymakers are interested in measures to support certain *businesses*, such as exporters of environmental products, rather than the products themselves. Both approaches by products or by activities are possible and complementary, but the integrated framework requires full clarity about them, for every variable.

Establishments can engage in the production of environmental products as part of their principal, secondary or ancillary activity (the principal activity of an establishment is the activity for which the value added exceeds that of any other activity carried out within the same unit, SNA §5.8). **Specialist environmental producers** are establishments whose primary activity is the production of environmental products. These producers can be identified by referring to the ISIC. **Secondary environmental producers** are establishments which produce environmental products as secondary activity. **Ancillary environmental producers** are establishments which produce environmental products as ancillary activity, otherwise said they do not sell their environmental production to other economic units but consume the outputs themselves. Ancillary producers could potentially include households too, because the institutional sector of the households contains the unincorporated enterprises.

The concept of specialist producers is introduced for two reasons. A first reason is practical: specialist producers are easier to identify (through ISIC), are ‘clustered’ in (homogeneous) industries and are responsible for a fair share of environmental production. The estimates for specialist producers may be more accurate. It is also possible to take assumptions with lower risks, e.g. assume that all their capital formation is for environmental production. Conversely, secondary producers and ancillary producers are scattered across many economic activities (in ISIC sense) and harder to identify but responsible for a share of production too big to be ignored. A second reason is conceptual: the intermediate consumption of specific products⁶ by specialist producers is a special variable needed in expenditure accounts: it must be deducted in the calculation of the aggregate ‘national environmental expenditure’ as failing to do so leads to double counting because both the expenditure on specific products used by specialist producers as intermediate consumption and expenditure for the purchase of the environmental products supplied by specialist producers are components of the ‘national environmental expenditure’.

Figure 3: Categories of producers



Secondary environmental producers are expected to be less important for environmental activity accounts than specialist or ancillary producers, and compiling figures for them is more labour-intensive than for the others. For this reason secondary producers are frequently grouped together with one of the other two categories. This grouping must be done in the same way in all the accounts in the integrated framework.

In principle, the classification of producers in specialist, secondary and ancillary producers is independent and transversal from the classification of producers in institutional sectors. This means that, in theory, specialist producers can be found in any institutional sector. However in practice the term 'specialist producer' is reserved for the specialist producers in the corporation sector (as opposed, in particular, to the government sector). This is both for conceptual and practical reasons.⁷

⁶ See section 3.3 for a definition of specific product

⁷ The functions of government units differ across countries e.g. in some countries government contracts out the production of specific environmental products to the private sector, whereas in other countries government sets up production units for this purpose. In the former case, all the units in the government sector engaged in production of specific products can be assumed to be specialist producers. Secondly, there are also differences across countries in the recording in the data sources for EPEA e.g. whether the underlying statistical unit in COFOG data is the institutional unit or the establishment. This matters for where the secondary activities are recorded

3.3. Environmental products⁸

Products play a very important role in environmental activity accounts because the production and expenditure on environmental protection and resource management is mostly about production of and expenditure on *products*.

Environmental products are produced, designed and manufactured for purposes of environmental protection and resource management. Environmental products can be distinguished into products for environmental protection and for resource management. Other products are non-environmental.

Environmental products can be distinguished according to which is their primary purpose. Products whose only purpose or primary purpose is environmental can be called **primary purpose environmental products**, or **specific environmental products** for short.⁹

There can also be some environmental product for which the primary purpose is not environmental but which may serve a secondary environmental purpose. **Cleaner products** are those non-specific environmental products which serve a secondary environmental purpose because they prevent pollution or environmental degradation because they are less polluting at the time of their consumption and/or scrapping, compared with equivalent 'normal' products (otherwise said: their secondary purpose is environmental protection). Examples include mercury-free batteries and cars or buses with lower air emissions. Cleaner products relate to environmental protection activities. Cleaner products are normally, but not always, costlier than equivalent 'normal' products.

Resource-efficient products are those non-specific environmental products which serve a secondary environmental purpose because they help to prevent natural resource depletion because they contain fewer natural resources in the production stage and/or require less natural resources during the use stage, compared with equivalent 'normal' products (otherwise said: their secondary purpose is resource management). Examples are recycled paper, renewable energy, heat from heat pumps and solar panels, resource-efficient appliances and water-saving devices such as tap filters.¹⁰ Resource-efficient products relate to resource management activities. Resource-efficient products are normally, but not always, costlier than equivalent 'normal' products.

The secondary purpose products are an innovation of the integrated framework. Cleaner and resource-efficient products have a role somehow similar to the adapted goods in SEEA CF and other manuals. However, they are not identical (they are not defined in the same terms), and a mapping is not possible.

Note that these definitions are more precise and tighter than those in previous standards. SNA

⁸ The definitions in this section are not identical to those currently in the SEEA CF and go further and beyond it. Note that SEEA CF has different definitions of environmental products for EGSS and EPEA (see SEEA CF §4.32, §4.53, §§4.96-4.99), which is not the case in the integrated framework

⁹ SNA 2008 §29.61 introduces the term 'specific product' with a different meaning. They are not to be confused.

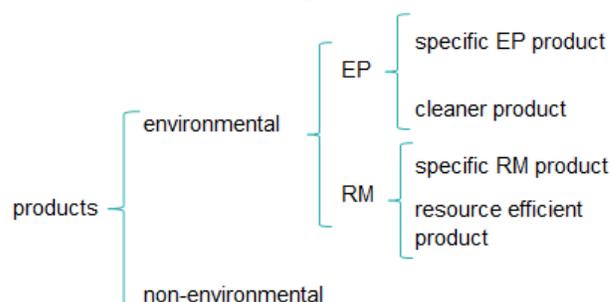
¹⁰ In practice, the ambition of measuring products which contain fewer natural resources in the production stage may be impractical. Any product using secondary raw materials are environmental products bottles from recycled glass or plastic, cars containing recycled steel, paper based on recycled paper or textile fibres. The current level of advancement does not allow to measure the composition of products. For this reason the focus of resource management is in material recovery and renewable energy,

2008, §29.59 states that ‘characteristic products are those that are typical of the field [in this case, environment]’, but it does not enter in what is ‘typical’. Similarly, SEEA CF §4.53 defines environmental protection specific services as those products that are characteristic or typical of EP activity. SNA 2008 §29.60 introduces the concept of ‘connected products’, defined as those ‘clearly covered by the given field [read: environment] without being typical’, but does not provide any further guidance. SNA §29.63 clarifies that ‘the precise borderline between characteristic and connected products depends on the economic organization in a given country and the purpose of a satellite account’. The definitions in the integrated framework do not have that problem. SNA’s ‘Connected products’ are part of the integrated framework’s secondary purpose environmental products, thus belong in the categories cleaner and resource-efficient products.¹¹

The same as for environmental activities, the definition of environmental products relies on identification of environmental purpose. Moreover, for environmental products a distinction is made between the ‘primary purpose’ or ‘secondary purpose’. In spite of current methodological guidance to identify environmental purpose, it is very difficult to determine the ‘primary purpose’ in a straightforward way. It requires expert analysis and judgement, product by product. Given the complexity and the impracticality, compilation of accounts frequently requires operational lists of environmental products, the same as for environmental activities. These lists must be discussed and established by experts, using the environmental purpose as guiding principle.

Environmental products may be goods or services. The integrated framework does not make a distinction between goods and services. National compilers may want to make this breakdown for compilation of the accounts or for dissemination. It would lead to a split of all the definitions, e.g. cleaner goods and cleaner services.

Figure 4: Categories of products



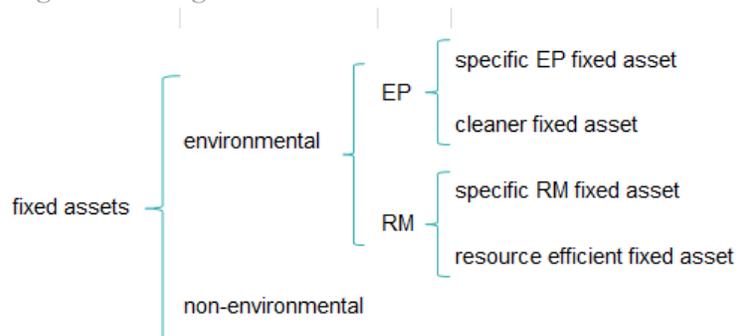
Specific products and cleaner/resource-efficient products can be produced by environmental producers as part of their principal, secondary or ancillary activity.

A similar terminology is needed for fixed assets, with a view to account for capital expenditure in EPEA and ReMEA. Fixed assets may either be goods (equipment and plant) or

¹¹ One example of confusing terminology is that 'connected products' according to the old EPEA terminology in Europe were environmental sole purpose products, or in other words 'specific EP goods', so not part of the cleaner products at all

services (R&D, technical services). Fixed assets can be environmental-related or non-environmental-related. The former are sub-classified into assets for environmental protection and assets for resource management. They are called **specific EP fixed assets** and **specific RM fixed assets**. Assets with a secondary environmental purpose will be called **cleaner fixed assets** and **resource-efficient fixed assets**, respectively.

Figure 5: Categories of fixed assets



This classification is based on the primary/secondary environmental purpose. Previously there were classifications based on types of technologies, in particular 'integrated technologies' and 'end-of-pipe technologies', sometimes used in innovation statistics or business statistics. These classifications are not identical but there is a certain correspondence between specific environmental fixed assets and end-of-pipe technologies, and between cleaner fixed assets and integrated technologies. This correspondence may be exploited for compilation purposes.

This classification of fixed assets is more relevant for some producers than for others. In the case of specialist producers, it is assumed that all their fixed assets are used for environmental activities. For them there is no need to distinguish between specific (=primary environmental purpose) and cleaner fixed assets (=secondary environmental purpose). Instead this typology of assets makes more sense when the principal activity of the producer is not an environmental activity.

4. Set of features for the accounts in the framework

This section presents the features of each account in the integrated framework. Features are the scope of the account, variables, valuation rules and main classifications.

When it comes to establishing the features of the individual accounts a balance is needed between a strictness and flexibility. The specifications of the accounts must be strict enough to ensure a standard for integration and coherence across accounts, but flexible enough for national compilers to adapt and decide which variables to compile according to national circumstances. To strike this balance, the description for each account distinguishes between 'core features' and 'other supplementary features'. 'Core features' are those features which define the account under the integrated framework. National compilers of the account must implement the core features without any changes, for the sake of alignment to the standard. 'Other supplementary features' are possible extensions and adaptations earmarked for their interest.

Thanks to the modular structure of the integrated framework, national compilers can achieve a similar outcome compiling, e.g. two accounts in the integrated framework with only their core features, or one account with the core features and other supplementary features. This refers in particular to EGSS and EPEA.

The next sections present the features for the four accounts in the integrated framework.

4.1. Environmental goods and services sector account (EGSS)

Defining feature of this account: study the sector producing environmental goods and services (output and production-related variables) and the supply of environmental goods and services.

Core features:

- Scope: sector producing environmental goods and services (EGS). EGS are all environmental products (goods and services), as defined in section 3. It encompasses environmental protection and resource management. EGS includes specific, cleaner and resource-efficient products. EGS may be produced by specialist producers, secondary producers or ancillary producers, therefore all those types of producers belong in the EGS sector.
- Variables: Output (of EGS), gross value added (by producers of EGS), employment (by producers of EGS), imports (of EGS).
- Valuation rules: output at basic prices, gross value added at basic prices, imports at the equivalent of basic prices¹², employment in persons or jobs or full-time equivalent. Cleaner and resource-efficient products are valued at full costs.
- Classifications & breakdowns: by ISIC¹³, by types of output (market, non-market, own-account), by functional domain (CEPA-CReMA), by type of product (specific products, cleaner and resource-efficient products).

Other supplementary features¹⁴:

¹² More precisely, at the value of the point of entry in the economy, including costs, insurance and freight to reach the border (called CIF). See SNA 3.149 and 14.70 for details.

¹³ Or NACE in Europe. Idem for all other references to ISIC in this document.

- Additional variables: intermediate consumption (for the production of EGS)¹⁵(*), exports (of EGS) (*), taxes and subsidies on production (for the production of EGS) (*), compensation of employees (for the production of EGS) (*), consumption of fixed capital (by producers of EGS), net operating surplus (by producers of EGS).
- Valuation rules: intermediate consumption, GFCF and exports are valued at purchasers' prices any demand-based variable must follow the same valuation rule as in EPEA, as to ensure consistency. For tables to make the transition between EGSS at basic prices and EPEA at purchasers' prices, see section 5.
- Other classifications & breakdowns: distinguish between environmental goods and environmental services; further break down own-account output in ancillary output and output for own final use; breakdown by institutional sectors(*) (e.g. corporations, government, households, rest of the world, etc.); further breakdown in the corporate sector in specialist units and non-specialist units(*); further break down by product type beyond specific products vs cleaner/resource-efficient products; explicit identification of technologies for EP and RM.

Additional notes/explanations:

- It must be clear that the sector of environmental goods and services encompasses all units producing environmental goods and services. It is not only the units whose main activity is the production of environmental products.
- EGSS is not a functional expenditure account, such as EPEA, but it provides essential information for a supply table of environmental products, parts of a use table of environmental products and most of a production account (see section 5). This means an extension compared to the current EGSS.
- Some EGSS variables are about environmental *products* (such as output) and others are about environmental *producers* (such as gross value added). As seen in section 3, there is no 1:1 correspondence between producers and products, e.g. because environmental products may also be produced by non-specialist producers as part of their secondary or ancillary production. This means that estimating EGSS requires a blend of approaches by product and by activity. Indeed, national compilers may need operational lists of environmental products *and* activities.
- As compared to EPEA, EGSS has a focus on product breakdowns, types of output (market, non-market, etc.), analysis of production and ISIC breakdowns of producer units. Instead there are no breakdowns by institutional sector. Those breakdowns are not needed for a supply table, but they could be used in a production account (see section 5). It is possible to derive rough breakdowns by institutional sector on the basis of the available breakdowns by ISIC and market, non-market output¹⁶.

¹⁴ Variables marked with an asterisk have a secondary interest for the defining scope of EGSS as listed above. They are currently part of EPEA but can be more efficiently compiled in EGSS. For instance, compensation of employees can be calculated as a by-product of employment and gross value added, already collected in the EGSS, etc; intermediate consumption (for the production of environmental products) is the difference between output and gross value added already collected in EGSS;

¹⁵ In some countries it may be derived as difference between output and gross value added.

¹⁶ Allocation of output and other variables to sectors can start from mapping market output to corporations, non-market output to government & NPISH and output for own final use to households, as a starting point.

- By way of exception to the previous point, the variable intermediate consumption of EGS by specialist producers, which is proposed in the list of supplementary features, requires an approach by institutional sector. Specialist producers belong in the corporate sector. This variable is needed for EPEA. If calculated in EGSS, this variable requires a careful identification by ISIC, market output and principal activity, to correspond to the specialist producers.
- Ideally, imports and exports of EGS are estimated together, and then applied in EGSS or EPEA. National compilers are free to estimate them as part of EGSS or EPEA.
- EGSS, and to a lower extent EPEA, are closely related to the Clean Technology Satellite Account such as developed in Canada.

4.2. EPEA

Defining feature of this account: study demand and financing of environmental protection (EP), in particular the national expenditure on EP and its components. This consists mostly of current and capital expenditure. Provide main information about the financing of this expenditure, in particular financing from/to the rest of the world.

Core features:

- Scope:
 - Of activities: environmental protection activities (EP), but resource management is out of scope and addressed in ReMEA.
 - Of products: all environmental protection products (including *goods and services*) (EPGS), including expenditure in specific EP products and cleaner EP products, including ancillary output and output for own-final use.
- Variables:
 - About expenditure: final consumption (in EPGS), intermediate consumption (in EPGS), intermediate consumption of EPGS by specialist producers, gross fixed capital formation¹⁷ and acquisitions less disposals of non-produced non-financial assets (such as land) (of EPGS), GFCF and acquisitions less disposals of non-produced non-financial assets (such as land) (for the production of EPGS), exports (of EPGS), intermediate consumption of EPGS by specialist producers.
 - About financing: environmental transfers from/to the rest of the world.
- Valuation rules: Final consumption, intermediate consumption, GFCF: all at purchasers' prices; exports are valued free-on-board (FOB), which is somehow the equivalent of purchasers' prices, up to the border point. Because exported products are consumed abroad, the actual purchasers' price is unknown and irrelevant for our economy. Instead what matters is the value of the exported products at the point of exit from the exporter's economy. For details see SNA §§13.149, 14.70.

Cleaner products are valued at purchasers' prices with two valuations: at the extra costs and at full costs. As cleaner products do not serve a primary environmental

¹⁷ Called GFCF for short throughout this document

protection purpose, they are not accounted at their full value; only the 'environmental protection share' should be accounted for, which can be measured by the extra cost of the cleaner product compared to an equivalent normal product. This principle is known as extra costs valuation or additional cost valuation. Should this cost happen to be negative, it is accounted as zero cost.

The valuation at full costs is for consistency between EPEA and EGSS (i.e. to re-use estimates across accounts). It is also informative by itself, to know the full value of these products. It is also observable and easier to measure. The extra costs are relevant to know how much more expensive these products are and their 'environmental share'. The estimation of extra costs is more difficult. The estimation of extra costs may be facilitated if a valuation at full costs is available as starting point. This matter requires more research.

- Classifications & breakdowns (minimum): by functional domain (CEPA); by institutional sector incurring expenditure (government –including non-profit institutions serving households-, corporations - further broken down in specialist producers and non-specialist producers-, households); by product type (specific EP products and cleaner products).

Other supplementary features¹⁸:

- Additional variables:
 - About production¹⁹: compensation of employees (by producers of EPGS) (*), taxes and subsidies on environmental products (*) (to reconcile valuation at basic prices and at purchasers' prices), output (of EPGS), imports (of EPGS), employment (by producers of EPGS), consumption of fixed capital (by producers of EPGS), net operating surplus (by producers of EPGS).
 - About financing: environmental transfers between the institutional sectors in the country (corporations, government, households), distinction between current and capital transfers.
- Other classifications & breakdowns: distinction between environmental goods and environmental services, by types of output (market, non-market, other), detailed classification of environmental products (i.e., same as used in EGSS) (*), industry classification by ISIC(*).
- Valuation rules: Any variable about production must be valued in the same way as in EGSS, as to ensure consistency.

Additional notes/explanations:

- There are two main changes in this proposal as compared with the current EPEA: first, the scope is extended from only EP services to EP goods and services. Secondly,

¹⁸ Variables marked with an asterisk have a secondary interest for the defining feature of EPEA as listed above but they may be compiled in EPEA. There may be interest to do so either for historical reasons (if historically they are calculated in EPEA, even if they may better belong in EGSS (e.g. output, compensation of employees) or for convenience to reconcile with EGSS (e.g. exports, taxes less subsidies on products).

¹⁹ It is recommended to collect those variables from EGSS. However, national compilers may choose to compile only a 'beefed up' version of EPEA including those additional variables, rather than EGSS and EPEA.

historically, EPEA collected some supply side variables (see SEEA CF §4.39, which were inconsistent and hard to reconcile with output from EGSS). At that time EGSS did not exist. The scope is aligned to EGSS and, to avoid duplicities, it is proposed that output variables are collected only in EGSS (but countries which choose to compile only EPEA can do so including additional supply side variables). Besides, there are other differences with the current EPEA: new approach for cleaner products, double valuation of cleaner products (at full costs and extra costs), different distribution of imports and exports of EP products between EGSS and EPEA.

- EPEA provides most of the elements for an expenditure account on environmental protection products. It also provides most of the elements for a use table of environmental protection products (see section 5 below). In addition, it provides the main information about transfers on environmental products with the rest of the world. The main aggregate provided by EPEA is the national expenditure on environmental protection.
- As compared to EGSS, EPEA is less concerned with breakdowns by types of environmental output and more concerned with breakdowns by institutional sector, e.g. who spends – government, corporations, households, rest of the world.
- EPEA is concerned both with the gross capital formation by *producers* of environmental products (i.e. the capital purchases of the environmental producers) and the gross capital formation of environmental *products* (i.e. environmental products which are capital products; they are output of the environmental producers).
- EPEA, at least the simplified version currently in the EU, does not collect systematically all the environmental transfers across institutional sectors. Instead it focuses on transfers between the (economic units in the) national economy and the rest of the world, as they are necessary to calculate the national expenditure on EP, and the transfers between the government sector and the other sectors in the country, as those are the biggest in size and easiest to estimate from available data sources. Transfers between sectors not involving the government have secondary importance in EPEA. A systematic collection of all environmental transfers between the institutional sectors of the economy would be left out of EPEA and it would remain for the ESST module.

4.3. ReMEA

Defining feature of this account: study demand and financing of resource management (RM), in particular the national expenditure on RM and its components. This consists mostly of current and capital expenditure. Provide main information about the financing of this expenditure, in particular financing from/to the rest of the world.

All the explanations in the previous section about EPEA are equally valid for ReMEA, with the only difference that ReMEA addresses resource management rather than environmental protection. Correspondingly it uses the CReMA classification instead of CEPA. Source data are scarcer.

Core features:

- Scope:

- Of activities: resource management activities (RM), but environmental protection is out of scope.
- Of products: all resource management products (including *goods and services*) (RMGS), including expenditure in specific RM products and cleaner RM products, including ancillary output and output for own-final use.
- Variables:
 - About expenditure: final consumption (in RMGS), intermediate consumption (in RMGS), GFCF (in RMGS), GFCF (for the production of RMGS), exports (of RMGS), intermediate consumption of RMGS by specialist producers.
 - About financing: environmental transfers from/to the rest of the world.
- Valuation rules: Final consumption, intermediate consumption, GFCF, exports: all at purchasers' prices. Resource-efficient products are valued at purchasers' prices with two valuations: at the extra costs and at full prices.
- Classifications & breakdowns (minimum): by functional domain (CReMA); by institutional sector incurring expenditure (government –including non-profit institutions serving households-, corporations - further broken down in specialist producers and non-specialist producers-, households); by product type (specific RM products and cleaner products).

Other supplementary features²⁰:

- Additional variables:
 - About production: compensation of employees (by producers of RMGS) (*), taxes and subsidies on RM products (*) (to reconcile valuation at basic prices and at purchasers' prices), output (of RMGS), imports (of RMGS), employment (by producers of RMGS), consumption of fixed capital (by producers of RMGS), net operating surplus (by producers of RMGS).
 - About financing: environmental transfers between the institutional sectors in the country (corporations, government, households), distinction between current and capital transfers.
- Other classifications & breakdowns: distinction between environmental goods and environmental services, by types of output (market, non-market, other), detailed classification of environmental products (i.e., same as used in EGSS) (*), industry classification by ISIC(*).
- Valuation rules: Any variable about production must be valued in the same way as in EGSS, as to ensure consistency.

Additional notes/explanations:

- The proposed framework has identical architecture for ReMEA as for EPEA e.g. same variables, but some details can be simplified if scarcity of data sources does not allow compilation. Integration with EGSS would also be identical. In this regard the EGSS

²⁰ Variables marked with an asterisk have a secondary interest for the defining feature of ReMEA as listed above but they may be compiled in ReMEA. There may be interest to do so either for historical reasons (if historically they are calculated in ReMEA, even if they may better belong in EGSS (e.g. output, compensation of employees) or for convenience to reconcile with EGSS (e.g. exports, taxes less subsidies on products).

may be used as an important data source that can (partly) overcome the shortage of data sources for ReMEA.

4.4. Environmental subsidies and other transfers (ESST)

Defining feature of this account: study the environmental subsidies (on EGS) and other transfers (related to EGS), in particular in more detail than done in EPEA and ReMEA. The coverage of ESST is narrower but deeper than EPEA, ReMEA or EGSS. Transactions between all institutional sectors are considered (government, corporations, households) and not only to/from the rest of the world.

National accounts has many categories of unrequited payments by units. Subsidies are just one type: subsidies are those affecting the price levels, in particular to influence the levels of production or imports (subsidies, SNA D.3), further sub-divided in those subsidies payable per unit of a good or service (subsidies on products, SNA D.31) or not (other subsidies on production, SNA D.39). Current transfers in which one unit provides an (environmental) product or asset to another one without receiving from the latter anything in return are divided in current transfers on income, wealth, etc. (SNA D.6), other current transfers (SNA D.7) and capital transfers (SNA D.9). ESST covers all such transfers provided the underlying product is an environmental good or service (EGS).

Core features:

- Scope: environmental subsidies and other transfers on EGS, either for environmental protection or resource management. Coverage of environmental products: all environmental products (including goods and services), including specific services, cleaner products and resource-efficient products, etc.
- Variables (minimum):
 - About expenditure:
 - Subsidies on environmental products (defined as D.31 in SNA, and applied in ESST to EGS)
 - Other subsidies on environmental production (defined as D.39 in SNA and applied to the production of EGS)
 - Other current environmental transfers (defined as D.6, D.7 in SNA and related to EGS or their production) and capital transfers (D.9 in SNA and applied to capital EGS)²¹
 - About financing: environmental transfers from/to the rest of the world (i.e. between resident and non-resident units)
- Classifications & breakdowns (minimum): by functional domain (CEPA&CReMA); by institutional sector (government –including non-profit institutions serving households-, corporations - further broken down in specialist producers and non-specialist producers-, households).

²¹ These categories subsidies on products, other subsidies on production, other current transfers, capital transfers can be mapped to the terminology used in SEEA CF para 4.138 and Table 4.8: social benefits, investment grants, rents, donations, other transfers, etc.

Other supplementary features:

- Other variables: the subsidies and other transfers in the core features are within the scope of SNA. Other transactions outside the scope of SNA can be considered e.g. tax abatements and other type of support measures (price support, regulatory support mechanisms, etc.)²² This is a major point of interest for some policymakers, but these situations are elusive to identify and measure. More research work is needed.
- Other classifications & breakdowns: Subsidies broken down by ISIC of the producer²³; by type of environmental product subsidies (specific product, cleaner product, resource-efficient product).

Additional notes/explanations:

- ESST is a specialised account supplementing EGSS, EPEA and ReMEA. ESST covers fewer flows but in more detail (environmental subsidies and transfers are already captured with less detail in the other accounts). In addition, ESST covers other flows out of the scope of the core modules e.g. tax abatements.
- There are three aspects where ESST goes beyond EPEA:
 - About expenditure, more product detail of taxes and subsidies on environmental products. This may be useful for balancing of supply and use tables (section 5) with higher level of EGS detail than available in EGSS, EPEA and ReMEA. Ideally this would be done by product (e.g. at level of three groupings: specific product, cleaner product and resource efficient product), ISIC and functional domain (CEPA-CReMA).
 - About financing, transfers between the institutional sectors in the economy (supplementary information in the module ESST, see below). Necessary for a more complete understanding of financing of environmental activities
 - Transfers beyond those in the SNA production boundary.
- ESST studies Subsidies on products (SNA D.31) because of their analytical value as they alter the prices of environmental products paid by consumers. Its compilation is also relevant as they allow balancing EGSS estimates at basic prices and EPEA estimates at purchasers' prices (see section 5 about supply-use tables).
- ESST studies Subsidies on production (D.39) because they are related to other variables about production by environmental producers collected in EGSS and EPEA such as employment, compensation of employees, operating surplus, consumption of fixed capital, etc.
- Other transfers within the scope of SNA are covered in EPEA only as far as it regards flows from/to the rest of the world (i.e. between resident and non-resident units) or they involve the government sector. ESST provides flows between the institutional sectors (government, corporations, households). ESST provides a more thorough and comprehensive framework.
- The simultaneous breakdown of subsidies by ISIC of the producer, by CEPA&CReMA of the function and by institutional sector is a main strength of ESST

²² See Eurostat Environmental subsidies and similar transfers guidelines, 2015 edition

²³ This type of breakdown is not relevant for transfers different from subsidies

because EGSS and EPEA uses only two breakdowns. In addition, it is possible to have breakdowns by type of environmental products and by types of output (market, non-market, etc.)

5. Integrated set of tables

This section presents a set of tables to make the link between the accounts presented in the previous section. A complete functional accounting structure is sought putting together data elements from EGSS, EPEA and ReMEA, The set of tables is based on similar tables in SNA. These tables can be used either for compilation of the accounts or for dissemination purposes. Key indicators can be derived, e.g. for EPEA and EGSS.

The tables in this section may be useful depending on national circumstances. National compilers are not required to produce these tables. For instance, countries compiling the accounts with an activity-approach rather than a product-approach may find little advantage in producing supply and use tables for compilation purposes. Countries compiling only one of the accounts in the integrated framework, or only the core variables or several accounts, may not be able to fill completely the tables proposed in this section, yet they can assist to order and structure the information compiled.

The tables in this section may be adapted, e.g. with regard to product detail, producer detail (industry) or user sector in the columns of the use table, adding breakdowns by characteristic and non-characteristic activities, etc.

5.1. Supply and use tables for environmental products

Supply and use tables are a powerful tool with which to compare and contrast data from various sources and improve the coherence of the economic information system (SNA chapter 14). In particular, supply and use tables for environmental products can be used to improve the coherence of information coming from EGSS, EPEA, ReMEA and ESST, as well as underlying data sources.

In a product balance, the amount of a product available for use within the economy must have been supplied either by domestic production or by imports. The same amount must be used for intermediate consumption, final consumption, capital formation or exports:

$$\text{Output} + \text{imports} = \text{intermediate consumption} + \text{final consumption} + \text{capital formation} + \text{exports} \quad (\text{Equation 1})$$

Because of valuation differences in the left and right side of Equation 1, it is necessary to add taxes on products less subsidies on environmental products, and trade and transport margins, to the left-hand side.

Supply and use tables for environmental products are two tables with similar structure. The supply table shows how environmental products are produced and imported. The use table shows how these products are used by companies, households and government and exported. The tables follow the format of the ‘general’ monetary supply and use tables of the SNA. The supply and use tables have detail of ‘individual’ environmental categories (detail by CEPA-CReMA and are more suitable for detail by type of environmental product), which instead the production and expenditure accounts do not have.

The supply and use tables presented in SEEA CF par. 4.60 and table 4.3 have a very limited scope, i.e. they cover only environmental specific services related to CEPA. The scope in the

integrated framework is extended to include the full scope of environmental products, namely environmental specific products and cleaner and resource efficient products, and both environmental protection (CEPA) and resource management activities (CReMA). Tables 1a and 1b present supply and use tables. Colours illustrate which account may be the basis for the table data, but it can be different e.g. if EGSS or EPEA include additional variables.

The **rows in the supply table** (Table 1a) report the different environmental products. There are many different environmental goods and services, so a classification system has to be applied to provide some order. Different classification systems can be used, for example international classification systems such as CPC. National compilers can also break down output by market, non-market and own-account production, e.g. in rows. Here we propose to use the following hierarchy to build a classification for environmental products in the supply and use tables, which also follows the recommendations by Eurostat (2015):

- a) CEA classification (CEPA/CReMA)
- b) Specific environmental products or cleaner and resource efficient products. Additional product detail, e.g. distinguishing different categories of specific products for each functional domain, may be useful to compare and contrast data, and may be relevant for users. National compilers must decide which is the best level of detail.

Additional variables compiled in EGSS, e.g. employment, compensation of employees, etc. can be reported in additional rows at the bottom of the use table (not shown in Table 1b).

The **columns in the supply table** show:

- a) Output of environmental products by ISIC industries (including a column for total). National compilers may consider, as alternative or as supplement, a reporting breakdown of market production, non-market production, ancillary activities and production for own-final use.
- b) Taxes less subsidies on environmental products. First are the taxes. The most important tax on environmental products is the VAT. Only non-deductible VAT must be recorded. A simple, rough calculation is possible applying the tax rate corresponding to the product. Guidance on a more detailed, accurate calculation can be found in the Eurostat EGSS handbook ed. 2016, box 17, page 126. Second are the subsidies. Subsidies on environmental products are estimated from ESST and from EPEA or EGSS. The former may have more product detail.
- c) Trade and transport margins for environmental products. This column is included for conceptual completeness but the values can be expected to be zero or very small. Wholesale and retail sale of EGS is not an environmental activity, thus not included in EGSS nor EPEA or ReMEA, but if there is a trade or transport margin in the price of environmental products, the supply table would have totals different from the use table. Environmental *services* have zero margins (i.e. they are not transported and they are delivered directly by the producer). Environmental *goods* have margins only if they are not purchased from the producer. Trade and transport margins can be estimated as residual items (i.e. by difference with everything else in Equation 1), based on specific studies or using rough percentages as margins.

- d) Imports of environmental products. These are not the same as the imports by environmental producers
- e) Total supply of environmental products. It must match the total use from the use table

Table 1a: Supply table for environmental products

SUPPLY	Output at basic prices					Total output basic prices	Imports	Taxes less subsidies on environmental products	Trade and transport margins	Total supply purchasers' prices
	ISIC A	ISIC B	ISIC C	ISIC D	ISIC...					
	CEPA 1									
Specific products										
Cleaner products										
CEPA.....										
Specific products										
Cleaner products										
CReMA 1										
Specific products										
Resource-efficient products										
CReMA....										
Specific products										
Resource-efficient products										
TOTAL										

= EGSS-based
 = based on ESST or EPEA+ReMEA or EGSS
 = via balancing of supply-use of products

The **rows in the use table** (Table 1b) are the same as in the supply table.

The **columns in the use table** show:

- f) Intermediate consumption of environmental products by ISIC industries (including a column for total)
- g) Final consumption of environmental products by government and households
- h) Gross capital formation of environmental products. This column includes acquisitions less disposals of non-produced, non-financial assets by producers of environmental products (e.g. land)²⁴
- i) Exports of environmental products
- j) Total use of environmental products. It must match the total supply from the supply table

Compilers distinguishing characteristic or non-characteristic activities may use this information e.g. in the columns. This is not shown in Tables 1a and 1b.

²⁴ National compilers may choose to show in a separate column Changes in inventories of environmental products

Table 1b: Use table for environmental products

USE	Intermediate consumption (by corp., government, households) (breakdowns by industry)					Total intermediate consumption	Final consumption		Gross fixed capital formation	Exports	Total use at purchases' prices
	ISIC A	ISIC B	ISIC C	ISIC D	ISIC...		Government	Households			
CEPA 1											
Specific products											
Cleaner products											
CEPA.....											
Specific products											
Cleaner products											
CReMA 1											
Specific products											
Resource-efficient products											
CReMA.....											
Specific products											
Resource-efficient products											
TOTAL											

= EPEA-based
 = ReMEA-based

5.2. Environmental production account

The ‘environmental production account’ presents information on the output of all environmental goods and services by the economy and how much of this output is available for domestic uses. See Table 2. As compared to the supply and use tables, there is less interest product breakdowns and more interest in economic actors and economic flows between them.

The **top part of the account** is a combined production and generation of income account that is also presented in SEEA CF (table 4.2). The **bottom part of the account** shows how much environmental output is available for national uses and links directly to the expenditure account. This part of the account uses the supply-use relationship and thus also directly links to the supply and use tables. The two dimensional environmental production account does not report CEPA and CReMA categories, only total environmental production. The production account can also be compiled for individual CEPA and CReMA domain.

The **columns show** a breakdown of the environmental production activities. It is possible to distinguish characteristic and non-characteristic activities (not shown in Table 2). For characteristic activities we propose to distinguish between a) Government and b) Corporations. Corporations may be broken down by a) principal and secondary activities (together) and b) own account activities. We thus do not distinguish specialist producers. For non-characteristic activities we propose no further disaggregation, so only ‘corporations’. We thus assume that government cannot engage in non-characteristic activities. Countries not distinguishing between characteristic and non-characteristic activities must opt to report in the columns a breakdown by Government, corporations and households, with a sub-category for specialist producers under the corporation sector.

The **rows** follow the accounting logic which is directly based on the SNA. The top part of the account describes the intermediate consumption (row 1, here for the sake of illustration breakdowns by product types are shown in rows 2-4), value added (row 5) and output of environmental producers in basic prices (row 10). Intermediate consumption is disaggregated into specific environmental products, cleaner and resource efficient products (rows 2-4). Total environmental output at basic prices is also disaggregated into market and non-market output (rows 11 and 12). The bottom part of the account describes how to transform valuation from

total environmental output at basic prices to environmental output at purchasers' prices available for national uses (row 21) using the supply use relationships. Finally, in row 22 a correction is made for the extra costs, as to allow a reconciliation of the two types of valuation for secondary purpose products.

The colours in table 2 are indicative of where the data can come from: EGSS, EPEA, ReMEA, ESST. However different solutions are possible, e.g. if EGSS or EPEA include variables beyond their core features. The colours in table 2 show that the environmental production account requires combining data from EGSS, EPEA, ReMEA, ESST, and this is only possible if they fit under the same framework.

Table 2: Environmental production account

	Government	Corporations		Rest of the world	TOTAL
		specialist units	non-specialist units		
1 Intermediate consumption [P2]					
2 specific environmental products					
3 cleaner products					
4 resource-efficient products					
5 Value added					
6 Compensation of employees [D1]					
7 Taxes on production [D29]					
8 Subsidies on production [D39] (-)					
9 Consumption of fixed capital [K1]					
10 Net operating surplus					
11 TOTAL environmental output (basic prices)					
12 market output					
13 non-market output					
14 own account output					
15 Intermediate consumption of environment products (-)					
16 VAT and other taxes on environmental products [D221] (+)					
17 Subsidies on environmental products [D221] (-)					
18 Trade and transport margins					
19 Imports of environmental goods and services (+)					
20 Exports of environmental goods and services (-)					
21 Total environmental output at purchasers' prices available for national uses					
22 Extra costs correction for cleaner and resource-efficient products (-)					
23 Total environmental output at purchasers' prices available for national uses: extra costs					
Supplementary items					
24 Employment					

	= EGSS-based		= EPEA+ReMEA-based
	= not applicable		= based on EPEA+ReMEA or EGSS or ESST
	= via balancing of supply-use of products		

5.3. Environmental expenditure accounts

The top part of the environmental expenditure account (rows 1-10) describes the domestic use of environmental products (Table 3). It is directly linked to the production account as total national use of environmental products (row 10) equals total environmental output at purchasers' prices available for national uses (row 21 in the production account).

The **rows** distinguish intermediate consumption (row 1), final consumption (row 4) and gross fixed capital formation (row 7). Each of them can be further disaggregated into specific environmental products, cleaner products and resource-efficient products. Not all types of expenditure are applicable to all sectors.

The bottom part of the expenditure account (rows 11-23) consists of two parts: the first part (rows 11-17) provides the additional items needed to calculate total national environmental expenditure. The second part (rows 18-23) allows the calculation of how much each different sector contributes to the financing of the national environmental expenditure. The national total in rows 17 and 23 are identical but the distributions by sectors differs because row 17 reports the expenditure and row 23 reports the financing. The completeness of the financing part relies on estimates from the ESST module.

In the **columns** a breakdown of the institutional sectors is provided, i.e. corporations, government, NPISH, and households. Corporations are broken down, in this case and for the sake of illustration, by specialist and non-specialist producers, and by principal, secondary and ancillary activities.

Table 3: Environmental expenditure account

	Corporations		Households	Government	Rest of the world	TOTAL
	specialist units	non-specialist units				
	principal activities	secondary activities				
1 Intermediate consumption	[EPEA+ReMEA-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
2 specific environmental products	[EPEA+ReMEA-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
3 cleaner and resource efficient products	[EPEA+ReMEA-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
4 Final consumption	[EPEA+ReMEA-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
5 specific environmental products	[EPEA+ReMEA-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
6 cleaner and resource efficient products	[EPEA+ReMEA-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
7 Gross fixed capital formation	[EPEA+ReMEA-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
8 specific environmental products	[EPEA+ReMEA-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
9 cleaner and resource efficient products	[EPEA+ReMEA-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
10 TOTAL domestic use of environmental products	[EPEA+ReMEA-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
11 Gross fixed capital formation (non environmental) for characteristics activities	[EPEA+ReMEA-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
12 Acquisition less disposals of non-financial, non-produced assets for the production of EP/RM service (NP)	[EPEA+ReMEA-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
13 Transfers not included in the total use of environmental products	[EGSS-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
14 Environmental subsidies on products (D31)	[EGSS-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
15 Transfers to the rest of the world (D7, D9) (+)	[EGSS-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
16 Transfers from the rest of the world (D7, D9) (-)	[EGSS-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
17 TOTAL national environmental expenditure	[EGSS-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
18 Environmental subsidies on production (D39)	[EGSS-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
19 Social contributions and benefits (D6)	[EGSS-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
20 Other current transfers (D7)	[EGSS-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
21 Capital transfers (D9)	[EGSS-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
22 Earmarked taxes (D2)	[EGSS-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]
23 TOTAL national environmental expenditure	[EGSS-based]		[not applicable]	[not applicable]	[not applicable]	[not applicable]

[EGSS-based]	[EPEA+ReMEA-based]	[ESST-based]
[not applicable]	[based on EPEA+ReMEA or EGSS or ESST]	

6. Environmental activity accounts not included in the integrated framework

As stated above, the integrated framework is not meant to cover all the environmental activity accounts. Some accounts in SEEA CF chapter IV do not need to be part of the integrated framework because they are not about environmentally beneficial products or activities, but about other products or activities or economic flows which have an impact on the environment.

One example is the account on taxes on environmentally harmful products, normally called 'environmental taxes' or environmental taxes by economic activity (ETEA). The environmental taxes account (ETEA) is a specialised account covering a topic not addressed in the other activity accounts. ETEA covers environmental taxes, defined as taxes on 'something that has a proven, specific negative impact on the environment'²⁵, i.e. environmental harmful products. Note those are different from the taxes on environmental products, as defined in section 3 above. Taxes on environmentally harmful products are not always for the purpose of environmental protection or resource management, as money collected from environmental taxes may be used for many purposes, including some who have nothing to do with environmental protection or resource management.

ETEA is rather a standalone module sharing some technical elements with the other activity accounts, such as national accounts concepts (definition taxes), same classifications (ISIC), etc.²⁶

The features of ETEA are summarised as follows:

Coverage of activities: all production activities in the economy, as well as taxes on income and capital taxes.

Coverage of products: products that have a proven, specific negative impact on the environment. Different approach to (non)environmental purpose than the core accounts and ESST.

Classifications used in this account are ISIC of the paying unit and type of underlying tax base (energy, transport, pollution, resource)²⁷. Conceptually it is also possible to break down by functional domain (CEPA-CReMA) but very demanding in practice. Other possible breakdowns are by institutional sector (including distinction in the corporate sector between specialist units and non-specialist units).

There is a link between ETEA and EPEA with regard to the so called earmarked taxes which describes the transfers to calculate the financing of the environmental protection expenditure. It is worthwhile to identify in the environmental taxes module these so called earmarked taxes and make them consistent with the taxes that are reported in the EPEA.

Besides the environmental taxes, as defined above, it is possible to cover other variables in this account. For instance, potentially environmental damaging subsidies (see SEEA CF

²⁵ SEEA CF para 4.150 and also Eurostat Environmental taxes statistical guide, 2013 edition, page 9

²⁶ Earmarked taxes are included in the integrated framework as part of the financing in ESST

²⁷ SEEA CF para 4.155

4.147). The identification and measurement of PEDS requires more research work. It is a separate topic on the SEEA CF research agenda.