

# **39<sup>th</sup> Meeting of the European Statistical System Committee**

Luxembourg

**7<sup>th</sup> February 2019**

Item 3 of the agenda

European strategy for environmental accounts 2019-2023  
Work Programme Objective 05

## **1. RECOMMENDATION FOR ACTION**

The ESS Committee is invited to endorse the annexed European strategy for environmental accounts for the period 2019-2023 (the ESEA 2019).

## **2. BACKGROUND AND BRIEF HISTORY**

The European strategy for environmental accounts is the ESS strategy to further develop and promote the use of the environmental accounts. The first such strategy dates from 2003, and similar ones followed in 2008 and 2014. Taken together as a continuous body, those strategies have been instrumental to the enormous advancement of environmental accounting in Europe during the last 15 years.

As the current strategy ends in 2018, Eurostat with the Directors of sectoral and environmental statistics and accounts (DIMESA) propose a new one for the period 2019-2023. The new ESEA 2019 is the result of consultations with users and of discussions by the working groups on environmental accounts and on monetary environmental statistics and accounts as well as the DIMESA Bureau and DIMESA in 2018.

Environmental accounts capture the links between the economy and the environment in a way consistent with the national accounts. There are six mandatory European environmental accounts under Regulation (EU) 691/2011 (amended in Regulation (EU) 538/2014) on the following topics:

- air emissions
- environmental taxes
- material flows
- environmental protection expenditure
- production and jobs in the environmental sector
- physical energy flows.

For these accounts, there are also voluntary extensions beyond the Regulation e.g. additional variables, breakdowns, etc. In addition to those six mandatory accounts, there are two voluntary environmental accounts on:

- forests
- environmental subsidies and similar transfers.

Other accounts in other areas remain to be developed to meet new user needs, including ecosystem accounts, which is a recent policy priority.

Environmental accounts draw on a large number of available data sources such as agricultural, forestry and fishery statistics; PRODCOM statistics; external trade statistics; energy statistics; national accounts and government finance statistics; structural business surveys; labour force survey; air emissions inventories, etc. Those sources serve as basis for the accounts and are necessary for good quality environmental accounts.

Thanks to the European strategy for environmental accounts and its implemented actions, Europe is at the forefront of environmental accounting worldwide and a key player at UN level with significant contributions to the development of the System of Environmental-Economic Accounting 2012 (SEEA) which was adopted as an international standard by the UN Statistical Commission.

In October 2017, anticipating the end of the current European strategy, DIMESA agreed to develop a new 5-year strategy for the period 2019-2023. DIMESA asked Eurostat to prepare a draft and provided guidance on the contents and level of ambition. Eurostat prepared a roadmap and guided the process through four successive drafts, which were discussed with users, in working groups, in the DIMESA Bureau and by DIMESA. DIMESA approved the draft annexed in October 2018.

### 3. POLICY CONTEXT

Environmental accounts were set up after formal user demand in the Commission Communication COM (94) 670 final *Directions for the EU on Environmental Indicators and Green National Accounting* (as well as the documents cited therein), which *inter alia* called for a European system of integrated environmental and economic accounting and for enlarging the work on satellite accounts to the national accounts. Among many other policy documents that are important in this context (e.g. the EU environmental action programmes), it may be useful to highlight COM (2009) 433 final on *GDP and beyond* which includes a section on integrated environmental-economic accounting and resulted in an action plan at ESS level to develop *inter alia* environmental accounts.

Regulation (EU) No 99/2013 on the European statistical programme 2013-17 as extended to 2020 by Regulation (EU) 1951/2017 foresees the provision of a set of environmental accounts that is coherent with macroeconomic statistics, providing information on atmospheric emissions, energy consumption, flows of natural resources and raw materials, environmental taxation, investment, growth and jobs in the environmental sector, environmental expenditure and transfers as well as environmental footprints (objective 2.2.1); the further development of experimental ecosystem accounts that make use of existing data as part of a long-term data integration initiative and to provide indicators on nature, biodiversity and ecosystems, including bird indices (objective 2.2.1); and the implementation of integrated environmental and economic accounting for forestry (objective 3.3.4).

Environmental accounts are used for a growing number of EU policies. Indicators derived from the accounts are used for monitoring EU progress towards the SDGs, the circular economy, resource efficiency, the European Semester and the 7<sup>th</sup> Environment Action Programme. This includes indicators on resource productivity, Domestic Material Consumption, Circular Material Use, environmental taxes and on the Environmental Goods and Service Sector.

Furthermore, there is policy demand for potential additional applications in the areas named above as well as in green growth and green jobs, climate change and energy union, natural capital, biodiversity, environmental taxation, transport policies, sustainable financing and bio-economy.

Outside the European Union, the adoption of the 2030 Agenda for Sustainable Development and the UN Sustainable Development Goals (and the related SDG indicators) and the Paris Agreement and the 2030 framework for fight against climate change were most notable. Work on environmental accounting also progressed at international level, with the System of Environmental-Economic Accounting (SEEA central framework) adopted by the UNSC in March 2013 as a statistical standard. The new ESEA 2019 will be the EU plan for SEEA implementation.

Most if not all of these initiatives require more comprehensive and robust data sets to monitor and evaluate progress towards the agreed policy objectives. The SDG indicators to monitor progress should also capture the interlinkages between the goals and reflect evidence on cases where they can mutually support each other or where some trade-offs exist. Environmental accounts can therefore have a key role for the SDG monitoring. Transforming the basic data in these various areas to align with the ESA concepts and classifications significantly enhances the possibilities for analysis of the mutual interactions between the economy and the environment and about synergies

and trade-off between different dimensions. The role of environmental accounting is expected to increase substantially in future, both directly as a provider of data and as an organising framework.

#### 4. CONSEQUENCES FOR NATIONAL STATISTICAL INSTITUTES

The main goals of the proposed ESEA 2019 are that the environmental accounts meet the user needs for high quality data and that they are well-known and valued. The focus for the next years is to continue improving the quality of the current European environmental accounts, better communicate the results and further develop the current accounts with extensions, applications and indicators. Because of expected growing demand for environmental accounts in the context of the SDGs, circular economy and other environmental-related policies, continuing the development of the accounts in a number of areas is proposed.

The production of the European environmental accounts requires resources in the ESS. Resource requirements for the current environmental accounts modules are modest and stable. A large part of the initial investment has been made and most of the human resources required are already in place for most countries. As regular data production of accounts introduced in 2017 becomes industrialised and routine, efficiency gains are possible. On the other hand, meeting new user needs requires developing solutions based on the current accounts i.e., new indicators, applications and extensions.

Environmental accounts do not generally require new data collection but create additional uses for national accounts data (e.g. supply-use and input-output tables), for environment statistics and other areas of statistics. Primary data for environmental accounting, alongside the national accounts, are environment, energy, transport, forestry and other statistics as well as other data held by ministries, specialised institutions and environmental agencies. The new strategy will improve the integration of environmental accounts aspects into these other statistical areas thus making production more efficient.

#### 5. OUTSTANDING ISSUES

Because of expected growing demand for environmental accounts in the context of the SDGs, circular economy and other environmental-related policies, it is proposed to continue developing the accounts in a number of areas up to a point where informed decisions can be made about their usefulness, feasibility and costs.

In addition, the strategy considers **a mid-term review in 2020** to re-assess the policy context, user needs, advancement of methodology and feasibility of new mandatory modules. Eurostat will of course consult the ESS Committee on any new modules that would be proposed for inclusion under Regulation (EU) 691/2011.

#### 6. RISK ASSESSMENT

The lack of a coherent EU-wide statistical strategy would make it more expensive to advance for the ESS, regarding the six modules under Regulation (EU) 691/2011, the voluntary data collections and new development areas. Existing environmental accounts would not be fully utilised for new data needs such as SDGs.

Lack of a credible outlook confirming the further improvement and development of environmental accounts would favour work outside the ESS in ad-hoc ways, less well co-ordinated with socio-economic statistics, without the use of agreed standards, and delivering less reliable and less comparable results. The benefits from a European approach (common standards, sharing of best practices, comparable data, common tools etc.) would not fully materialise.

## **7. NEXT STEPS**

Once approved by the ESS Committee, the ESEA 2019 will be implemented by Eurostat together with DIMESA and the working groups on environmental accounts and on monetary environmental statistics and accounts.

# EUROPEAN STRATEGY FOR ENVIRONMENTAL ACCOUNTS (ESEA 2019)

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## Executive summary

Environmental accounts capture the links between the economy and the environment and can contribute to assessing progress towards a sustainable growth, as defined by the Sustainable Development Goals (SDGs), adopted by the UN General Assembly in 2015.

The European strategy for environmental accounts describes priorities and actions to develop and use environmental accounts in a harmonised way in Europe.

This new European strategy for environmental accounts for the period 2019-2023 ('ESEA 2019') builds on the previous strategies adopted in 2003, 2008 and 2014. Taken together as a continuous body, those strategies have been instrumental to the enormous advancement of environmental accounting in Europe during the last 15 years. Thanks to the ESEA and its implemented actions, Europe is at the forefront of environmental accounting worldwide.

In the period covered by the ESEA 2014-2018, the European environmental accounts have grown in many domains from experimental to mainstream official statistics. The main successes were the vast improvements in data availability (environmental areas and countries) and in data quality (comparability across countries, completeness, timeliness, transparency) following [Regulation \(EU\) No 691/2011](#) and its amendment in [Regulation \(EU\) 538/2014](#), which give legal coverage to six environmental accounts. Environmental accounts-based indicators are increasingly being used for EU high-level and sectorial policies. Users are gradually becoming aware of the accounts and their potential uses, albeit much remains to be done about communication. The main challenge in the period 2014-2018 was developing new areas in the absence of suitable basic data and without additional resources.

Environmental accounts are used for a growing number of EU policies. Indicators derived from the accounts are used for monitoring EU progress towards the circular economy, resource efficiency, the European Semester and the 7<sup>th</sup> Environment Action Programme. This includes indicators on resource productivity, Domestic Material Consumption, Circular Material Use, environmental taxes and on the Environmental Goods and Service Sector. The European environmental accounts have a key role in the context of monitoring progress of the EU towards the SDGs; in particular, the accounts can show how different SDGs can support each other.

There is potential for additional applications. The table below gives examples of policy areas which can be served by environmental accounts (note that some of the accounts listed are not yet fully developed in the EU).

Policy area	Possible environmental accounts
Monitoring progress towards the SDGs in the EU	air emissions accounts, material flow accounts, energy accounts, environmental taxes, environmental goods and services sector accounts, ecosystem accounts, waste accounts
7 <sup>th</sup> Environment Action Programme	material flow accounts, air emissions accounts, environmental protection expenditure accounts, water accounts, ecosystem accounts
Resource efficiency	material flow accounts, ecosystem accounts, environmental taxes, water accounts, land accounts
Circular economy, sustainable	material flow accounts, waste accounts, forest accounts (for

consumption	flows of natural resources), environmental goods and services sector accounts and environmental protection expenditure accounts
Green growth and green jobs policies	environmental goods and services sector accounts
Climate change and energy union	air emissions accounts, energy accounts, forest accounts, environmental subsidies, environmental goods and services sector accounts (for jobs in renewable energies), resource management expenditure accounts (for investments and financing of renewable energies)
Natural capital, biodiversity	ecosystem accounts, forest accounts, water accounts, land accounts
Environmental taxation	environmental taxes, environmental subsidies
Sustainable financing	(financing part of) environmental protection expenditure accounts and resource management expenditure accounts, environmental goods and service sector accounts (if also including an indicator on finance)
Bio-economy strategy	environmental goods and services sector accounts, material flow accounts (biomass), ecosystem accounts

The new ESEA 2019 proposes a strategic and forward-looking direction for the work until 2023. This strategy is aspirational but realistic. It is flexible to take account of uncertainties in the next years in important areas such as a new EU sustainable development strategy<sup>1</sup> and a new European environment strategy beyond 2020<sup>2</sup>.

Ultimately, the main goals of the ESEA 2019 are that the environmental accounts meet the user needs for high quality data and that they are well-known and valued. To achieve these goals, four key objectives for work are proposed, plus a fifth objective of support activities. The main four objectives will be pursued in parallel but have the following ranking of priorities:

Priority	Objectives
1	Continue improving the quality of the current European environmental accounts, including long time series
2	Better communicate the relevance and content of the European environmental accounts
3	Serve user needs by offering further extensions, applications and indicators, including footprints, based on the current European environmental accounts
4	Enlarge the European environmental accounts with new areas, in particular: <ul style="list-style-type: none"> <li>• Ecosystem accounts</li> <li>• Environmental subsidies and similar transfers</li> <li>• Resource management expenditure accounts</li> <li>• Land accounts (land use/land cover)</li> <li>• Forest accounts</li> </ul>

<sup>1</sup> The Commission intends to adopt the reflection paper "Towards a Sustainable Europe by 2030" in end 2018 or early 2019

<sup>2</sup> The new environmental strategy will build on the evaluation of the 7<sup>th</sup> Environment Action Programme currently ongoing

	<ul style="list-style-type: none"> <li>• Water accounts</li> <li>• Subsidies or support measures potentially harmful for the environment</li> </ul> <p>Some of these areas can possibly be underpinned with a legal basis</p>
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The difference between priority 3 and 4 is that the former makes further use of currently existing accounts whereas the latter is about longer-term development of new accounts. The priority ranking 1 to 4 was established as a compromise between costs and benefits, short-term feasibility, long-term impact and need or not for legal basis. The areas listed in priority 4 were identified based on the needs of the main institutional users and their potential for use for the SDGs.

In addition to these four priority objectives, a fifth cross-cutting objective is about support activities, in particular to producers of the accounts (financial resources, training, handbooks, compilation tools) and contributions to the global standards of the UN System of Environmental-Economic Accounting (SEEA)<sup>3</sup> and global initiatives (SDGs).

In order to ensure flexibility, given uncertainties about EU policy needs beyond 2020 and progress in developing new areas, a mid-term review of the ESEA 2019-2023 is proposed in 2020. The priorities may be revised in the mid-term review also taking account of user needs. This review will take place at the level of the Directors of sectoral and environmental statistics and accounts (DIMESA). That will also be the opportunity to decide as to whether Regulation (EU) 691/2011 on European environmental accounts should be amended to give legal cover to some of the new development areas and for other technical adjustments which may be needed.

Finally, it is worth mentioning that the ESEA functions as the plan for implementation of the global UN SEEA in the EU. This EU plan does not prevent individual countries or groups of countries from doing more depending on their national circumstances, policy needs and resources.

## **Section 1. Value added of environmental accounting and progress so far**

### **1.1. The value added of environmental accounting**

Environmental accounts are a powerful multipurpose information framework suitable for assessing sustainable development and many other policy areas, such as climate change, air pollution, energy, transport, raw materials, fiscal policies and opportunities for growth and jobs in the environmental sector. They play an important role in capturing the synergies and trade-offs in progressing towards the SDGs.

Environmental accounts allow gaining more insight into the sustainability aspects of our economic behaviour. Mainstream economic statistics, such as the national accounts, do not record environmental aspects in our patterns of production, consumption, investment or financing. The environmental accounts allow integrating economic and environmental aspects to complete this picture.

Developing the environmental accounts in the EU is among the five actions of the Commission's 2009 Roadmap on GDP and beyond<sup>4</sup> aiming at using complementary indicators of progress beyond GDP.

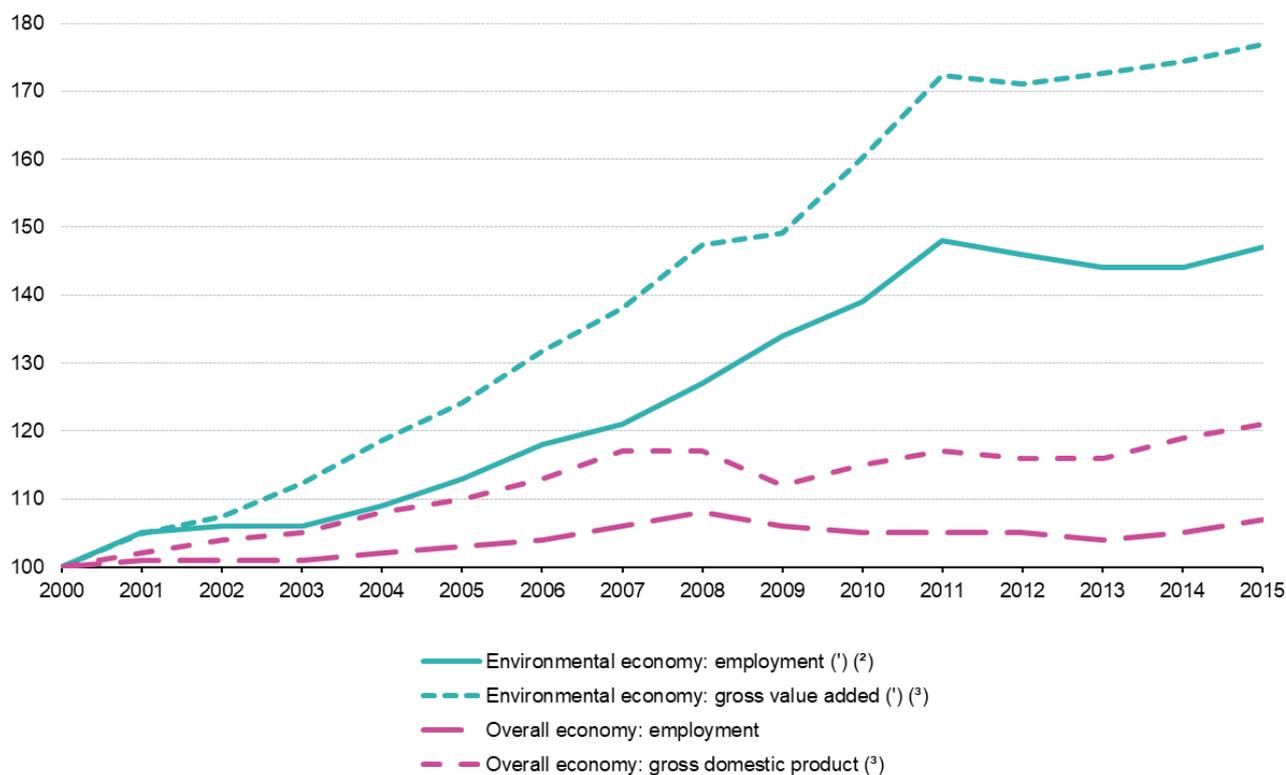
The figure below is one example of how environmental accounts complement and complete

<sup>3</sup> <https://seea.un.org/>

<sup>4</sup> Communication from the Commission to the Council and the European Parliament - [GDP and beyond: measuring progress in a changing world](#), COM(2009) 433

national accounts. This figure shows the growth of the environmental sector (based on environmental accounts - EGSS) alongside the growth of the whole economy (based on national accounts). They can be compared because the underlying statistical frameworks are aligned by construction.

### Employment and gross value added in the environmental economy (EU-28, 2000=100)



(1) Eurostat estimates; (2) Full-time equivalents; (3) Index compiled for chain-linked volumes data in EUR million (reference year 2010; at 2010 exchange rates)

The key feature of environmental accounts is *integration*. This concerns both integration of environmental and economic aspects, and also integration of diverse thematic environmental aspects such as energy, taxation and air emissions; material extractions and waste; expenditure and investment of government and businesses, etc.

This integration is a key feature demanded by both data users and producers. Data users seek coherent indicator sets, connection of sectoral policies, enhanced possibilities for analysis and statistics adaptable to new information needs. The accounts facilitate this because:

- They generate coherent sets of indicators that are linked to one another in a comprehensive economic and environmental context. Correspondingly, the accounts are well placed for assessment frameworks relating to the key components of natural capital (air, water, land and biodiversity) and to serve multidimensional, cross-cutting topics such as progress towards the SDGs or the circular economy
- The accounts provide structure and enhance possibilities for analysis. Information is organised to exploit synergies across individual thematic areas. This facilitates cost-effectiveness analyses, scenario modelling and forecasts. The accounts allow the allocation of emissions or resource use to imports, exports, consumption and investment using input-output techniques. Other applications include measuring the contribution of natural resources and energy to economic growth (growth accounting, decomposition analysis)

- The accounts facilitate producing new statistical products and indicators that the users demand, thus providing a fast response to new policy needs at lower production costs and with low administrative burden.

Data producers seek to deliver high quality information and reuse available data to limit new data collections. The accounts facilitate this as follows:

- The accounting approach delivers high quality statistics by ensuring coherence of the sets of accounts. The accounts integrate source data and provide a robust basis for estimates e.g. when source data are not available annually or are incomplete. By combining sources in a framework, they can indirectly produce estimates for issues which cannot be (fully) observed, such as generation of food waste or flows of secondary raw materials. Re-using data limits response burden and overcomes resource limitations
- The accounts help to structure existing data to make more and better use of otherwise scattered primary data. The accounts play an organising role within the statistical system. They can provide feedback to enhance coherence of primary data. Cooperation with the national accounts is particularly important and beneficial for both national and environmental accountants
- Environmental accounts are compiled according to the global frameworks, concepts and methods of the UN SEEA, which ensure international comparability.

At European level, the *European* environmental accounts underpin the supranational dimension of the environmental issues and provide a systematic approach and coverage across Member States and environmental topics that facilitate policy assessment.

Environmental accounts are used for a growing number of EU policies. Indicators derived from the accounts are used for monitoring EU progress towards the circular economy, resource efficiency, the European Semester and the 7<sup>th</sup> Environment Action Programme. This includes indicators on resource productivity, Domestic Material Consumption, Circular Material Use, environmental taxes and on the Environmental Goods and Service Sector. The European environmental accounts have a key role in the context of monitoring progress of the EU towards the SDGs; in particular, the accounts can show how different SDGs can support each other. There is potential for additional applications. The table below gives examples of policy areas which can be served by environmental accounts (note that some of the accounts listed are not yet fully developed in the EU).

Policy area	Possible environmental accounts
Monitoring progress towards the SDGs in the EU	air emissions accounts, material flow accounts, energy accounts, environmental taxes, environmental goods and services sector accounts, ecosystem accounts, waste accounts
7 <sup>th</sup> Environment Action Programme	material flow accounts, air emissions accounts, environmental protection expenditure accounts, water accounts, ecosystem accounts
Resource efficiency	material flow accounts, ecosystem accounts, environmental taxes, water accounts, land accounts
Circular economy, sustainable consumption	material flow accounts, waste accounts, forest accounts (for flows of natural resources), environmental goods and services sector accounts and environmental protection expenditure accounts

Green growth and green jobs policies	environmental goods and services sector accounts
Climate change and energy union	air emissions accounts, energy accounts, forest accounts, environmental subsidies, environmental goods and services sector accounts (for jobs in renewable energies), resource management expenditure accounts (for investments and financing of renewable energies)
Natural capital, biodiversity	ecosystem accounts, forest accounts, water accounts, land accounts
Environmental taxation	environmental taxes, environmental subsidies
Sustainable financing	(financing part of) environmental protection expenditure accounts and resource management expenditure accounts, environmental goods and service sector accounts (if also including an indicator on finance)
Bio-economy strategy	environmental goods and services sector accounts, material flow accounts (biomass), ecosystem accounts

## 1.2. Progress achieved during ESEA 2014-2018

In the period 2014-2018, the European environmental accounts have grown in many domains from experimental to mainstream official statistics, following the direction set in the ESEA 2014. The main successes were the vast improvements in data availability (environmental areas and countries) and firm improvements in data quality (comparability across countries, completeness, timeliness, transparency). Environmental accounts-based indicators are increasingly being used for EU sectorial policy purposes and for integrated policy making. Users are gradually becoming aware of the accounts albeit much remains to be done about communication. The main challenge in the period 2014-2018 was developing new areas in the absence of suitable basic data and without additional resources.

More in detail, there was a major impetus following the adoption and implementation of [Regulation \(EU\) No 691/2011](#) on European environmental-economic accounts, including a first set of accounts on air emissions, environmental taxes and material flow, and with first data provided in autumn 2014. Three years later, [Regulation \(EU\) 538/2014](#) amending Regulation (EU) No 691/2011 added three additional accounts on environmental protection expenditure, environmental goods and services sector and physical energy flows, with first data delivery in autumn 2017.

Furthermore, the Commission adopted specific legislation derived from the Regulation with a view to harmonise and ensure quality standards, in particular with the [implementing Regulation \(EU\) 2015/2174](#) on the indicative compendium of environmental goods and services, the format for data transmission for European environmental economic accounts and modalities, structure and periodicity of the quality reports; and [delegated Regulation \(EU\) 2016/172](#) supplementing the Regulation of the European Parliament and of the Council as regards specification of the energy products. In 2016 the Commission informed the European Parliament and the Council on the implementation of the Regulation in [this report](#).

Since 2014 there was steady progress to improve the quality of the first set of accounts, build longer time series, improve consistency, produce early estimates, improve validation and disseminate faster and better. For instance, economy-wide material flow accounts are now available at T+6 months, with time series stretching back to 2000 and for some countries even to 1990. The improved timeliness of the derived indicators boosts their uses for EU policies. Key methodological challenges were addressed e.g. allocation of road transport emissions or taxes paid by non-residents.

As regards the second set of accounts, an increasing number of countries have built up capacity through voluntary data collections, Eurostat issued guidelines (handbooks) and compilation tools (e.g. PEFA-builder). There was much progress in statistical infrastructure, in particular as regards input-output modelling tools and results (footprints, estimates in raw material equivalent), transmission standards (SDMX) and capacity building (European Statistical Training Programme). The outcome of all this work was a successful first delivery in late 2017.

Because of the focus on implementing the six accounts under Regulation (EU) 691/2011, work in other additional areas has continued at reduced pace. Developments in the additional areas mentioned in the ESEA 2014-2018 focused on ecosystem accounts and environmental subsidies. As regards ecosystem accounts, there was substantial development driven by the INCA project<sup>5</sup> (phase 1 completed and phase 2 advancing), the release in December 2017 of the [Technical Recommendations in support of the SEEA Experimental Ecosystem Accounting](#) and the start of the process of revision of the SEEA Experimental Ecosystem Accounting in 2017 and planned to be completed by end 2020.

Work on environmental accounting has also further progressed at international level. Eurostat and Member States contribute to the implementation of SEEA in the UNECE region, and to the development of global SEEA databases, in particular with OECD, UN Statistical Division, UN Environment and the International Resource Panel. The strategy has contributed to world-wide initiatives related to resource efficiency, green economy/green growth/green jobs, natural capital and the SDGs. European countries and Eurostat have had a leading role in the implementation of SEEA and the development of its research agendas, also through the London Group on environmental accounting.

## Section 2. Policy needs

Environmental accounts have developed fast in recent years in line with the policy need for data on the interlinkages between the economy and the environment. It is essential that environmental accounts have the necessary flexibility to adapt.

### 2.1. Main EU policy needs at the onset of ESEA 2014-2018

At the onset of the latest ESEA in 2014, the EU policy needs were mainly driven by the [Europe 2020 strategy](#) on smart, sustainable and inclusive growth (including among others the [resource efficiency flagship initiative](#) supporting the shift towards a resource-efficient economy, [targets for climate change](#) and progress reviewed under the [European Semester](#) to coordinate economic policies, encompassing also environmental dimensions) and the [7<sup>th</sup> Environmental Action Programme](#) to 2020. The latter has three inter-related thematic objectives, which have meanwhile also informed the UN Agenda 2030 and its SDGs: (1) to protect, conserve and enhance the Union's natural capital; (2) to turn the Union into a resource-efficient, green and competitive low-carbon economy; and (3) to safeguard the Union's citizens from environment-related pressures and risks to health and well-being. Natural capital relates to the Earth's key natural assets, i.e. air (including climate and air pollution), water, land and biodiversity and related ecosystems that provide a range of socio-economic services to humans. The growing human population and a shift to more resource-intensive habits and behaviours as societies become wealthier have increased the pressure on the natural capital and the related global ecosystems thereby increasing the sense of urgency of the transformation towards a sustainable economy that is resource efficient and circular.

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<sup>5</sup> Integrated system of Natural Capital and ecosystem services Accounting, see [project description](#) and [final report phase 1](#).

## 2.2. Current EU policy needs

Between 2014 and 2018, there were other important initiatives which are now solidly anchored in EU policies. At the EU level, these included the updating of the EU air quality and water policy frameworks: the European Commission [circular economy package](#) (and the related [monitoring framework](#)); the European Commission initiative on [Energy Union and climate](#) to shift to a low-carbon economy, and most recently the [Action Plan for financing Sustainable Growth](#). At the international level, the adoption of the 2030 [Agenda for Sustainable Development and the UN Sustainable Development Goals](#) (and the related SDG indicators) and the [Paris Agreement](#) and the 2030 framework for fight against climate change were most notable. Most if not all of these initiatives require more comprehensive and robust data sets to monitor and evaluate progress towards the agreed policy objectives.

The **UN 2030 agenda for Sustainable Development** to end poverty, protect the planet and ensure prosperity enshrines 17 Sustainable Development Goals (SDGs) and 169 targets to be achieved over the next 15 years, covering economic, social, environmental and governance issues. In July 2017 the UN General Assembly adopted a set of global SDG indicators to assess progress, while an EU set was first presented by the Commission in July 2017, and revised in March 2018. The SDG indicators to monitor progress should also capture the interlinkages between the goals and reflect evidence on cases where they can mutually support each other or where some trade-offs exist. Environmental accounts can therefore have a key role for the SDG monitoring.

The Commission intends to adopt a Reflection paper "Towards a sustainable Europe by 2030" which will form part of the discussion on the Future of Europe in end 2018 or early 2019.

The 2015 European Commission Circular Economy Package included a revised legislative proposal on waste and a Circular Economy Action Plan with measures aiming at "closing the loop" of product lifecycles through greater recycling and re-use, and bringing benefits for both the environment and the economy. The action plan promotes Europe's transition towards a circular economy, boosts global competitiveness, fosters sustainable economic growth and generates new jobs. The 2018 monitoring framework for the circular economy includes some indicators based on environmental accounts (e.g. circular material use rate), and there is room for wider use of the accounts.

The UN 2015 **Paris Agreement**, aiming at a sustainable low carbon future, points out the critical role of the land use sector in reaching our long-term climate mitigation objectives. Solid forest accounts and material flow accounts will support the understanding of changes in the carbon stocks.

The macro-economic impact of the energy transition towards a low-carbon economy is of high importance when monitoring the implementation of the **Energy Union strategy** and Strategic Energy Technology Plan (SETPlan). There is a strong need for statistics on the direct and indirect jobs generated by energy efficiency and clean energy technology activities, for gross value added/turnover of related industries, for public and private investments in energy and climate related research and innovation, number of researchers, the use of climate related taxes and subsidies and so on.

Emerging needs are embedded in the European Statistical Programme for 2018-2020. In order to support these information needs, [Regulation \(EU\) 2017/1951](#) amending Regulation (EU) No 99/2013 on the European statistical programme 2013-17 by extending it to 2020, states under the heading on *Environmental sustainability*: the further development of a coherent system of environmental accounts as 'satellite accounts' to the main national accounts in several areas including atmospheric emissions, energy consumption, flows of natural resources, trade in raw materials, environmental taxation and environmental protection expenditure and the further

development of experimental ecosystem accounts (second paragraph objective 2.2.1); under the heading *Geospatial, environmental, agricultural and other sectoral statistics* the Regulation foresees the implementation of integrated environmental and economic accounting for forestry (objective 3.3.4).

### 2.3. EU policies after 2020

Currently the policy context is in transition. The Europe 2020 Strategy will expire at the end of the decade. In 2019 European citizens will vote for a new European Parliament and there will be a new European Commission which will define the future strategy for sustainable growth in Europe. This will build inter alia on the reflection paper 'Towards a Sustainable Europe by 2030' which the Commission plans to adopt. An evaluation of the 7<sup>th</sup> Environment Action Programme is ongoing with stakeholder consultation taking place throughout the process, and the result of the evaluation is due early 2019. In November 2018 the European Commission will present its [proposal for a strategy for long term EU greenhouse gas reductions](#). More will be known about the follow-up and evolution of these processes in two years. It will therefore be appropriate to foresee a mid-term review of the ESEA 2019-2023 (see section 3)

In May 2018 the Commission adopted a [proposal for the next Multiannual Financial Framework 2021-2027](#), which requires relevant indicators and high quality statistics to measure the impact of the different EU funding programmes, on for example natural capital. The corresponding data needs are to be addressed in the next European Statistical Programme for the period 2021-2027<sup>6</sup> for which the Commission adopted a proposal in June 2018.

### Section 3. Future work for 2019-2023

Ultimately, the key goals for the period 2019-2023 are that the environmental accounts meet the user needs for high quality data and that they are well-known and valued. To achieve these goals, four objectives are proposed, plus a fifth one of support activities. The main four objectives will be pursued in parallel but have the following ranking of priorities:

Priority	Objectives
1	Continue improving the quality of the current European environmental accounts, including long time series
2	Better communicate the relevance and content of the European environmental accounts
3	Serve user needs by offering further extensions, applications and indicators, including footprints, based on the current European environmental accounts
4	Enlarge the European environmental accounts with new areas, in particular: <ul style="list-style-type: none"> <li>• Ecosystem accounts</li> <li>• Environmental subsidies and similar transfers</li> <li>• Resource management expenditure accounts</li> <li>• Land accounts (land use/land cover)</li> <li>• Forest accounts</li> </ul>

<sup>6</sup> The Commission adopted a proposal for a Regulation establishing the Programme for single market, competitiveness of enterprises, including small and medium-sized enterprises, and European statistics. More specifically the Programme provides the overall framework for the development, production and dissemination of European statistics for 2021-2027, COM(2018) 441 of 07.06.2018. Annex 2 describes the specific actions, including environmental economic accounts

	<ul style="list-style-type: none"> <li>• Water accounts</li> <li>• Subsidies or support measures potentially harmful for the environment</li> </ul> <p>Some of these areas can possibly be underpinned with a legal basis</p>
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The difference between priority 3 and 4 is that the former makes further use of currently existing accounts whereas the latter is about longer-term development of new accounts. The priority ranking 1 to 4 was established as a compromise between costs and benefits, short-term feasibility, long-term impact and need or not for legal basis. The areas listed in priority 4 were identified based on the needs of the main institutional users and their potential for use for the SDGs.

In addition to these four priority areas, a fifth cross-cutting area is about support activities, in particular to producers of the accounts (resources, training, tools, handbooks) and contribution to the global standards of environmental accounts.

In order to provide for flexibility, and given the uncertainties about the policy needs in the next years and progress of development in new areas, a mid-term review of ESEA is proposed in 2020. The priorities may be revised in the mid-term review also taking account of user needs. This review will take place at the level of the Directors of sectoral and environmental statistics and accounts (DIMESA). That will also be the opportunity to decide as to whether Regulation (EU) 691/2011 on European environmental accounts should be amended in order to give legal cover to some of the new development areas and for other technical adjustments which may be needed.

The next sub-sections further explain and develop each one of five priorities of work.

### 3.1. Continue improving the quality of the current European environmental accounts

The first priority is to further consolidate and improve the existing European environmental accounts (mandatory data based on Regulation (EU) 691/2011 and voluntary extensions). The three main interrelated goals are to expand the data offer (including longer time series back to 2000 or 1995), improve the quality of the data, refine methods and further improve international comparability. Environmental statistics serving as basis for the accounts are necessary for good quality environmental accounts. Good quality data sources should be maintained and the accounts should make the best use of new sources coming on-stream such as data on gross nutrient budgets based on an ESS agreement, new data collection possibly planned on land cover or land use, etc. Also part of this priority area is co-operating with the producers of source data, classifications and national accounts for mutual benefits.

The following list of indicative activities is proposed. These activities are explained in more detail in annex 1. This area is expected to be a focus of work at least until 2020. Afterwards, some resources could be shifted to the other priorities.

<b>Better quality assurance and more efficient data transmissions</b>	Raise quality standards for areas in need of improvements and develop methodology
	Assure the quality of transmitted data with validation procedures. Fully implement SDMX
	Develop and promote more efficient data production systems
<b>Expand data offer in terms of time, countries and variables</b>	Produce longer time series back to 2000 or 1995
	Improve timeliness of results by 12 months
	Improve reporting of voluntary variables in the mandatory data

	transmissions
<b>Make best possible use of available data sources</b>	Use the existing good quality data sources and incorporate new sources coming on-stream
<b>Liaise with other statistical producers</b>	Cooperate with producers of source data, classifications and national accounts for mutual benefits

### 3.2. Better communicate the relevance and content of the European environmental accounts

The second priority is about communication and relevance. Environmental accounts can only support informed decisions as much as they are used. In general, environmental accounts have not achieved yet their full potential use by institutional users and policy makers. The European environmental accounts must continue underpinning thematic policy agendas either as reference data source on their own or supplementing other thematic data.

Better communicating the accounts and promoting their increased use is an investment. It requires a deliberate effort and resources. Environmental accountants must actively engage to get the accounts better known and understood as well as used more intensively, including by cooperating with researchers and model builders. It would be wrong to take for granted the use of the accounts and the pull by data users. The UN Committee of Experts on Environmental-economic Accounting (UNCEEA) has developed a [global communication strategy](#) to increase implementation of the SEEA and mainstream its use in integrated policy making.

The following list of indicative activities is proposed:

<b>Increase relevance</b>	Cooperate with other agencies and institutions
	Maintain dialogue with key institutional users
<b>Better communicate</b>	Present the accounts as an integrated information system
	Develop clear and accessible dissemination products
	Adapt dissemination to the different types of users
	Interpret and analyse the results

### 3.3. Serve user needs by further developing extensions, applications and derived indicators

The third priority is about extensions, applications and derived indicators of the *current* European environmental accounts to enhance their usefulness, in particular for policy analysis. This includes a reflection on how the integrated system of accounts can play a greater role to generate policy-relevant information on cross-cutting issues such as sustainability, circular economy and natural capital.

The distinguishing feature of this third priority, in particular compared to the fourth priority, is its focus on enhancing our ability to deliver quickly whenever triggered by new user needs. Delivering new results under this area does not require a new or amended legal basis. One successful recent example is the case of the circular economy: in view of meeting a new emerging policy need, Eurostat developed and published new indicators and visualisation tools in less than one year by combining existing data from material flow accounts, waste statistics and external trade statistics. Current issues are the development of waste accounts (based on data already available from waste statistics), footprint measures as well as supporting the development of food waste statistics.

The following list of indicative activities is proposed:

<b>Develop extensions, application and indicators of the accounts established in the Regulation</b>	Develop new indicators based on current accounts to serve new policy initiatives
	Further develop footprint measures, in particular at country level
	Reflect how to use the integrated system of accounts to generate information for cross-cutting policies
	Explore new voluntary extensions to the mandatory data, if needed
	Support development of food waste statistics

### 3.4. Enlarge the environmental accounts with new areas

The fourth priority is enlarging the list of environmental areas covered by the European environmental accounts. A distinction is needed between advancing methodology and setting up mandatory data collections, i.e. developing these areas does not imply a commitment to eventually include them in the Regulation. This is addressed separately in the next two sub-sections.

#### 3.4.1 Methodological advancement

In the last decade or so, much progress has been achieved in a number of environmental areas besides those in Regulation (EU) 691/2011. Ecosystem accounts and environmental subsidies are two notable examples. It is important to further pursue these developments. The interactions of the economic actors and the environment are complex and multidimensional. Information frameworks encompassing only some of those aspects are incomplete and risk missing important interdependencies.

The table below proposes a set of development areas for the period 2019-2023. These areas are further explained and justified in annex 2. The list of areas is based on Regulation (EU) 691/2011 Article 10, previous discussions in DIMESA<sup>7</sup>, links to current accounts and SEEA standards and links to policy needs. The list below is ordered by a combination of policy priority and statistical capacity already developed in the area. This list may be adjusted during the mid-term review of ESEA in 2020.

Possible development areas	Status of development
Ecosystem accounts Possible frequency: for some elements a yearly update frequency will be feasible, for others every 3 or 5 years	European Commission experimental project INCA to produce EU-wide estimates by 2020
Environmental subsidies and similar transfers (i.e. on products beneficial for the environment) Possible frequency: annual	EU voluntary data collection exists since 2015. 9 countries participated in 2017
Resource management expenditure account	Working group guidelines exist

<sup>7</sup> DIMESA proposed not to pursue two topics mentioned in Regulation (EU) 691/2011 Article 10, namely 'economy-wide material stock accounts' and 'unused excavated earthen materials (including soil)'

Possible frequency: annual	
Land accounts (land use and land cover) Possible frequency: every 3 or 5 years	OECD publishes estimates based on satellite images and artificial intelligence recognition. Strong links with ecosystem accounts (extent accounts) and forest accounts
Forest accounts Possible frequency: annual	EU voluntary data collection exists since the 1990s, last revised in 2016. 24 countries participated in 2017, but many tables are incomplete or not reported
Water accounts Possible frequency: annual	Eurostat manual for physical water flow accounts exists
Subsidies or support measures on energy or transport (i.e. potentially harmful for the environment) Possible frequency: annual	Methodology under development for UN sustainable development goals

For a few of those development areas voluntary data collections may be set up, as part of their development into maturity.

### 3.4.2. Further developing the legal basis

Depending on progress, some of the development areas listed in section 3.4.1 may be further underpinned with a legal basis under Regulation (EU) 691/2011. The timing to take decisions would be around 2020, which coincides with the mid-term review of ESEA. This timing is conditioned by three main factors, namely: policy priorities, statistical maturity of the area and the timing of the legal procedure itself.

- i. Regarding the policy priorities, as seen in section 2, the context is currently in transition and there will be more information for a decision in 2020;
- ii. Regarding the statistical maturity and feasibility of the areas listed in 3.4.1. in two or three years from now there may be sufficient developments to make a difference in (some of) the areas earmarked;
- iii. Regarding the timing of the legal procedure itself, amending European legislation (with co-decision procedure, which is the case here) is a long and complex procedure. There is no simplified legal procedure for adding new Annexes to Regulation (EU) 691/2011 or for amending the existing ones. Preparation of the legal proposal, including additional internal Commission procedures in place since the last amendment of the Regulation, and subsequent discussion and adoption by the European Parliament and Council, takes at least three years.

If a decision to extend the legal basis is taken in 2020, the amended legal basis might be adopted in 2023 or 2024 and the first mandatory data transmission would start well after the period for this strategy. Therefore Member States would have ample time to prepare.

Having more accounts covered with a legal basis would require some additional resources temporarily until production processes become industrialised and routine, and afterwards to produce data each year. By 2020, the production of the six accounts in the Regulation should have achieved

full maturity and some resources may be shifted to other accounts.

Permanent derogations may be considered for new modules, under certain conditions, in particular: should the topic be not relevant for a Member States (e.g. non-existence of forests); in case of excessive burden to the country and if national figures are not essential to calculate European aggregates (e.g. small-sized Member States).

### 3.4.3. Other technical amendments to the legal basis

A possible review of the current legal base would also be the opportunity for other *technical* adjustments to the existing legal basis which have become necessary and to undertake simplifications of elements no longer needed. Some of these amendments would be desirable as soon as possible, but they are only possible in the context of a broader revision of the Regulation. Therefore the timing is determined by the considerations in section 3.4.2.

Some of those technical adjustments can be already anticipated<sup>8</sup>. Other adjustments can be explored<sup>9</sup>. A complete list of the technical adjustments would need to be developed for an informed discussion in 2020.

### 3.5. Support measures

This objective encompasses two groups of activities. The first one aims at supporting the statistical operations of environmental accounts. A sufficient number of staff with the appropriate skills is essential to produce high quality environmental accounts. It is essential to maintain the necessary financial and human resources, as well as the skills. Compilation tools and guidance material must be kept updated. Learning from each other must be encouraged, e.g. sharing best practices on both data compilation and communication.

A second group of measures aims at contributing to the global development of environmental accounts. Europe is a global leader in environmental accounting. This leadership must be put to use to help international organisations to develop and improve standards.

The following list of indicative activities is proposed:

<b>Resources and support measures for production of environmental accounts</b>	Allocation of sufficient staff resources
	Training of national experts and staff skills
	Provide compilation tools; promote pilot studies, e.g. with grants
	Maintain explanatory notes and handbooks
<b>Contribute to development of global environmental accounts</b>	Support the implementation of SEEA outside the EU
	Contribute to development of global standards and methodology

<sup>8</sup> For instance: the revision of the classification of environmental activities, addressing legal changes in structural business statistics, adjustments to Annexes IV (EPEA) and V (EGSS) to enhance their integration in a framework for the monetary environmental accounts and to tackle the issue of sustainable finance, deletion from Annex III (EW-MFA) of the tables C (Extra-EU imports) and E (Extra-EU exports) which are not needed anymore to produce EU aggregates

<sup>9</sup> For instance: anticipate reporting dates to improve timeliness (such as T+12 months for economy-wide material flow accounts), introduce earlier reporting for some key variables, align reporting dates to streamline production across different accounts (e.g. between EGSS and EPEA) or to streamline between data sources and accounts (e.g. between national tax lists and environmental taxes); include some formerly voluntary variables or tables, e.g. CO<sub>2</sub> taxes; simplify variables or tables with lower relevance

## Annex 1: Indicative list of activities

This annex describes in more detail the indicative list of activities under each area of the strategy. They are not listed in any particular order of priority, and this Strategy does not propose that every single activity is performed in full.

### 1. Continue improving the quality of the currently existing environmental accounts

- **Raise quality standards** for areas in need of improvements in accuracy and comparability. **Identify methodological areas** needing further clarification **and develop sound technical solutions**. Areas where such work is already ongoing include: the integrated framework for monetary environmental accounts, the review of the classification of environmental activities and the allocation of fuel consumption and air emissions by road transport to economic activities
- **Assure the quality of transmitted data** through improved validation procedures. The quality reports are a cornerstone tool to document sources and methods. Validation rules are discussed in the working groups. Fully implement the **statistical standard SDMX** for data and metadata transmissions under the Regulation
- Develop and promote **more efficient data production systems**, e.g. an integrated framework for monetary environmental accounts, integration with national accounts production, etc. Exchange experiences and identify best practices
- **Produce longer time series**, in particular for main aggregates and key indicators, with time series starting ideally in 2000 or 1995. This is essential to identify trends, allow data analysis and assess country performance. It also supports the work on quality as potential weaknesses become more apparent in longer series
- **Improve timeliness** of results, in particular for main aggregates and key indicators. Ideally improve timeliness by 12 months. This can be achieved with special procedures for early estimates<sup>10</sup>. Early estimates currently exist for some accounts, namely economy-wide material flow accounts and air emissions accounts; in those cases the next step is integrating them in the normal production cycle. Develop early estimates techniques for the other accounts and continue promoting that countries apply them on a voluntary basis, in particular for the accounts on which policy relevant indicators are based
- **Improve reporting of voluntary variables** in the mandatory transmission tables. Voluntary variables complete the picture, improve the uses and prepare the ground for future mandatory variables. Examples of variables for which the reporting can be improved are non-market and ancillary activities in EGSS as well as CEPA and CREMA breakdowns and voluntary components of NEEP in EPEA
- Cooperation with producers of source data for environmental accounts is necessary to **influence those sources for mutual benefits**. Environmental accountants should also **influence standard classifications** when the opportunity arises, e.g. whenever NACE is revised, and develop environmental-specific classifications as needed. Closer **cooperation with the national accounts** is particularly important and should be strengthened to benefit both sides. Methodological links between SNA and SEEA can be reinforced, especially with a view to a future revision of SNA. There are a number of areas where environmental accounts has more experience and better estimates.

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<sup>10</sup> Admittedly, early estimates involve a trade-off with accuracy. Users must be informed

## 2. Better communicate the relevance and content of the European environmental accounts

- **Cooperate with other agencies and institutions** having complementary know-how e.g. about assessment frameworks, modelling, blending environmental accounts with research data, etc. Possible partners for this co-operation are environmental agencies, Ministries of Environment, Ministries of Economy, academia and research organisations
- **Maintain communication and dialogue with key users** in particular with policymakers, but also with media and stakeholders also based on best practices in institutions and countries. It is vital at EU and at national level, to listen to their needs and priorities, explain the accounts, support them with assessment frameworks and data analysis, discuss feasibility of adjustments and changes
- Present and exploit the accounts as an **integrated information system**, rather than as a series of separate topical datasets in publications or databases
- Develop **clear and accessible dissemination products** using simple terms and language. Environmental accounts are rather technical and may be hard to navigate for non-experts. Advanced users need guidance on the reliability and robustness of the estimates, which may vary across accounts and even across different variables in the same account
- Enhance communication with a variety of **dissemination tools** adapted to the different types of users: web sites with text and data, short briefing notes, brochures, reports, maps, press releases and press conferences. Getting the right mix is the key to reach the greatest number of users. Visual tools and interactive tools for dissemination can make a big difference to make the accounts understandable
- **Interpret and analyse the results.** Just publishing the accounts is not informative enough for non-expert users. Dissemination products must build on a narrative. A first, simple step is writing articles and publications. It is important to publish together results from different accounts. In a second step combined analysis can be developed, i.e., using data from different accounts in indicators and modelling together. Priority topics for policymakers can be addressed with special studies based on the accounts. Candidate topics could include renewable energies or energy savings e.g. in buildings. Some NSIs may have institutional constraints to interpret and analyse results, e.g. their mandate is limited to publish results.

## 3. Serve user needs by further developing extensions, applications and derived indicators from the current environmental accounts

- Develop **new indicators** based on the current accounts to serve the information needs of policy initiatives. This may be necessary in particular whenever the results and aggregates of environmental accounts do not directly answer the questions posed by the users. The accounting structure facilitates producing new indicators and to summarise, adapt, process or combine with other data. This may be achieved with the existing data or it may also require exploring **new voluntary extensions** to the mandatory data or reviewing the relevance of existing ones. Better present existing and new indicators according to the economic activities. One example may be developing waste accounts based on the data already available from waste statistics, and consistent with material flow accounts, to serve the information needs for the circular economy
- Improve availability of **footprint measures**. Policymakers keep asking for footprints, e.g. material footprints in the context of the circular economy. For policy monitoring, it is particularly important to publish country estimates. Eurostat already publishes footprint-type indicators on materials, air emissions, and energy for the EU aggregate, using environmentally-extended input-output techniques enabled by physical environmental accounts broken down by industry. Further improve methodologies and tools to calculate

footprints and raw material equivalents that national compilers can use to calculate raw material consumption in the rest of the world. Develop environmentally-extended supply-use and input-output tables and standard analysis methods that are simple and transparent and that national compilers can use

- Support and provide input to the development of food waste statistics.

#### 4. Support measures

- **Allocation of sufficient staff resources** in the national statistical institutes is essential to produce high quality environmental accounts
- Ensure **training of national experts** and maintenance of **staff skills**. One useful initiative is the European Statistical Training Programme. The working groups must strengthen their important role to share experiences across countries
- Facilitate sharing of experiences and identification of best practices in all priorities, in particular regarding quality improvement (priority 1), communication (priority 2), serving users' needs (priority 3) and long-term development (priority 4)
- Eurostat to continue providing **compilation tools** to Member States whenever it is more efficient to develop tools at EU level
- Eurostat to continue **promoting pilot studies** and quality improvements in Member States, also supported with financial assistance in the form of grants, subject to availability of resources
- **Explanatory notes and handbooks** are very important for compilers and users. There is already a comprehensive body of handbooks and other reference material. It may need maintenance after a few years in particular if the current data collections are fine-tuned
- **Support the implementation of SEEA outside the EU** with examples of best practices, sharing handbooks, training and tools already available. Europe has a role to play in developing and promoting global standards for environmental accounts (SEEA) and supporting the implementation of SEEA outside Europe. Outside the EU, the environmental accounts are in demand as an integrating framework to assess the state and progress of high level policies such as the UN 2030 Agenda for Sustainable development and its Sustainable Development Goals, and to support work on green economy and green jobs by the OECD, UNEP and ILO.
- **Contribute to development of global standards and methodology**. The UN SEEA will be revised in the next years in view of being submitted to the UN Statistical Commission before the end of 2020 and a revision of the SEEA Central Framework may start before the end of this strategy. Europe is finding solutions to pending issues and documenting them in technical notes which can feed directly in the next revision of SEEA CF (and of the SNA). This was e.g. done regarding air emissions and energy use of real estate activities, and other such notes will follow, e.g. about the integrated framework for monetary accounts.

## **Annex 2: Proposed development areas**

**Ecosystem accounts.** There is a strong demand from environmental policymakers for more data on ecosystems and biodiversity. The EU Biodiversity Strategy requests Member States to develop Natural Capital accounting by 2020. This work is important to report progress on the 7<sup>th</sup> Environment Action Programme, the UN Convention for Biological Diversity and in the context of the SDG. At the moment this is very much research work, involving multidisciplinary teams comprising statisticians and experts in natural sciences as well as mapping agencies. NSIs have a role to play in cooperation with other partners. GIS experts have the knowledge about geospatial information systems and IT architecture. The Mapping and assessment of ecosystems and their services (MAES) community has know-how about valuation and assessment of ecosystem services. The research community has done a lot about modelling ecosystem condition and services (separately physical and monetary estimates). The statistical offices have the know-how to make of it a proper statistical product, internationally comparable and regularly maintained. The European Commission (including Eurostat), in cooperation with the European Environmental Agency, is developing the EU-wide INCA project (Integrated system of Natural Capital and ecosystem services Accounting) with a timeline until 2020. Members of the ESS and other stakeholders such as the research community can be engaged on a voluntary basis to increase the know-how basis.

Forest ecosystem accounts, freshwater ecosystems, or agro-ecosystems accounts might further progress as thematic accounts of ecosystem accounts, in particular building on MAES classification and indicator sets.

**Environmental subsidies and similar transfers (i.e. on products beneficial for the environment).** This area is both necessary to complete the picture of environmental activities and to provide information about implicit measures such as tax abatements. A voluntary data collection exists but it has not reached yet a critical mass of reporting countries. Data on (explicit) environmental subsidies exist and there are synergies with the production of other accounts, mostly EPEA and ReMEA, but they are focused on flows with the rest of the world rather than between institutional sectors. Statistics on tax abatements must be further developed as regards both methodology and practical measurement.

**Resource management expenditure accounts** showing at least as a priority the expenditure related to renewable energy resources, energy savings and material recovery. Investment in the green economy, linked to sustainable finance, is in the spotlight. Resource management activities are catching up in terms of importance with environmental protection activities and cannot be ignored. Resource management expenditure accounts are necessary to complete the picture of environmental activities alongside EPEA, EGSS and taxes and subsidies. A number of technical questions still remain about the scope and measurement of resource management activities. A task force is reviewing the classification of resource management activities. Source data is limited but it should be sufficient for a small scale, focused ReMEA. An updated handbook and a voluntary data collection may be ready by 2020.

**Land accounts (land use and land cover)** are closely related to ecosystem extent accounts. Land cover and use changes are linked to economic activities or political decisions. They describe changes according to their economic, natural or other causes. Complementary land accounts cover various land quality issues including land use intensity, fragmentation and partitioning of land, soil sealing or compaction, erosion and soil losses, role of soils in climate change, pollution of soils, etc. International work is in a rather advanced stage. Copernicus is an extremely rich data source about land, forest areas, water, etc. OECD has recently started to publish results on land cover changes and conversions. It should be possible to benefit from these international initiatives with limited

extra work.

**European forest accounts** consistent with SEEA CF are now developed, following the review and streamlining in 2015-2017, including timber resources and areas of wooded land (stocks and flows). Interest in forests has greatly increased due to their role in climate change, source of renewable energy and recyclable materials, and as a form of natural capital. The current data collection is voluntary and the datasets are incomplete. The current approach is mostly based on 10-yearly national forest inventories supplemented with annual data sources. It is not certain that data gaps will be reduced unless the approach is changed. Other sources are: Copernicus and satellite images, LUCAS, PRODCOM, etc.

**Water accounts** showing abstraction from the environment, water used by the various industries and households and water returned to the environment might also further progress as thematic accounts of ecosystem accounts. The conceptual work has advanced but progress is hampered by a lack of basic data and insufficient harmonisation. The data collection is currently voluntary and the datasets are incomplete. The European Environmental Agency also produces water data but synergies have not materialised yet. There are SDG indicators about water-use efficiency, water stress, water resource management and water-related ecosystems, some of which currently have no data or methodology.

**Subsidies or support measures on energy or transport** (i.e. potentially harmful for the environment). The aspects more interesting for policymakers are the most challenging ones to measure, namely implicit measures such as tax abatements, supporting price mechanisms, etc. Solutions must be developed. This may be done as an extension of environmental taxes (i.e. 'negative' taxes that are environmentally harmful).