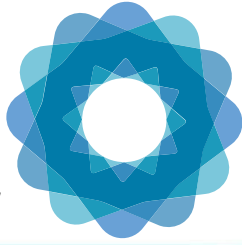


**30 Year
Anniversary**

of the London Group
on Environmental Accounting



System of
Environmental
Economic
Accounting

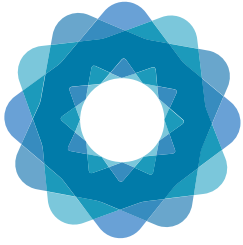
Climate Change Mitigation and Adaptation Expenditures: A Position Paper for the London Group on Environmental Accounting 30th Meeting

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Disclaimer: Any views expressed here are not necessarily the official views of any government or institution affiliated with the contributors: the U.S. Government, Bureau of Economic Analysis, International Monetary Fund, Eurostat, Destatis, or the U.K. Office for National Statistics.

30th September to 3rd October 2024 | Washington D.C



Overview

🌸 Climate Change Mitigation & Adaptation Expenditures

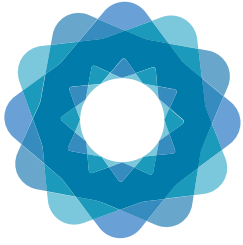
🌸 Background

🌸 Definitions

🌸 Key issues for the London Group to consider

🌸 Classifications, methodology, and data issues

🌸 London Group position on this topic? Some recommendations for moving forward.

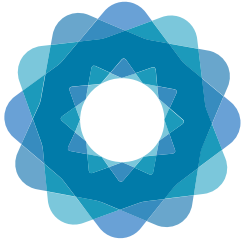


Background: Environmental Activity Accounts

❁ Chapter IV of the SEEA Central Framework covers environmental activity accounts and related flows

- ❁ Countries use these accounts to understand how much of the economy is devoted to protecting, preserving, and managing the environment
- ❁ Previously organized by relevant protection and management categories:
 - ⚙️ CEPA – Classification of Environmental Protection Activities
 - ⚙️ CReMA – Classification for Resource Management Activities
- ❁ Now: CEP – Classification of Environmental Purposes
- ❁ Where are climate change mitigation expenditures? Adaptation?





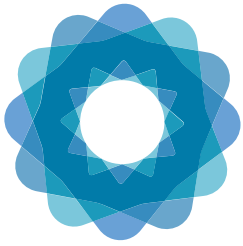
Setting the Scene in 2012

✿ Research agenda of the 2012 SEEA-CF in Annex II:

“Accounts and statistics relating to the minimization of natural hazards and the effects of climate change

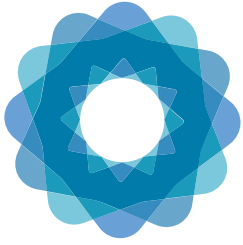
A2.19 The SEEA Central Framework limits the scope of economic activities considered to be environmental to environmental protection and resource management activity. However, it is recognized that there are a number of other economic activities that are related to the environment which may be of **particular interest for policy and analytical purposes** (see sect. 4.2). A specific set of activities encompasses efforts to minimize the impact of natural hazards (such as floods, cyclones and bush fires) and **efforts to mitigate, or adapt to, the effects of climate change.**”

(SEEA-CF, Annex II, pages 307-308, **emphases added**)



Recent Efforts in CC Mitigation & Adaptation

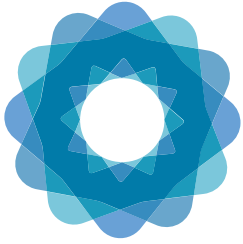
- 🌸 2022: G20 Data Gaps Initiative-3 Rec. 6 & 7 (more on this from the IMF team)
- 🌸 2024: EU legislation now requires reporting on **climate change mitigation investments**
- 🌸 2024 and beyond: United Nations Statistical Division (UNSD) and Committee of Experts on Environmental-Economic Accounting (UNCEEA)'s global consultation on the list of issues to be considered in the SEEA-CF Update:
 - 🌸 C6 - extending the scope of environmental activities → “investigate if and how to extend the scope to include for example to also include **climate change adaptation and mitigation** as well as environmental disaster management activities.”



Definitions: Purpose & Environmental Activities

🌸 Environmental activities in 2012 SEEA-CF

- 🌸 4.11 The scope of environmental activities encompasses those economic activities whose **primary purpose** is to reduce or eliminate pressures on the environment **or** to make more efficient use of natural resources.
- 🌸 UNCEEA's Technical note for the Environmental Goods and Services Sector Account:
- 🌸 13. There can also be some environmental products 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...Examples include mercury-free batteries and cars or buses with lower air emissions. 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 [fewer] natural resources during the use stage, compared with equivalent 'normal' products...



Definitions: IPCC

- Mitigation

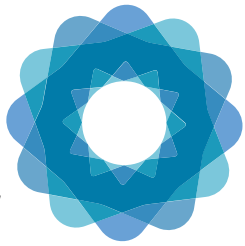
A human intervention to reduce emissions or enhance the sinks of greenhouse gases.

- Adaptation



In *natural systems*, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.

In *human systems*, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities.



(Source: <https://apps.ipcc.ch/glossary/>)

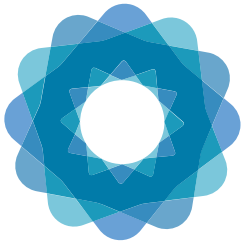


BEA (USA)


-  **Climate change mitigation expenditures** include economic activities whose primary purpose is to **reduce emissions or enhance the sinks of greenhouse gases**; or, they include products and services with specific secondary/technical purpose serving as the cleaner or resource-efficient alternative toward these ends.
-  **Climate change adaptation expenditures** include economic activities whose primary purpose is **adapting and building resilience of human systems and natural systems** to changing climate conditions.

Destatis (Germany)

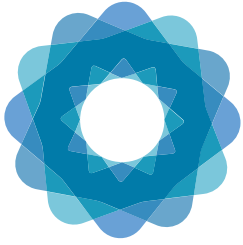
-  **Climate Change Mitigation expenditures** are expenditures aimed at reducing the emission of greenhouse gases into the atmosphere and enhancing sinks of greenhouse gases.
-  **Climate Change Adaptation** expenditures are expenditures aimed at adapting and building resilience of human and ecological systems to changing climate conditions, reducing vulnerability, and minimizing negative climate change impacts.



Eurostat definitions

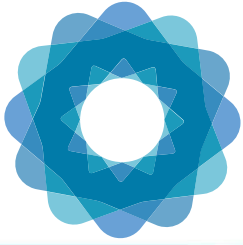
 **Climate change mitigation:** To align with SEEA CF §§ 4.11 – 4.13, Eurostat defines characteristic activities for climate change mitigation those activities directly serving a climate change mitigation purpose and climate change mitigation related products those services and goods produced, designed and manufactured for purposes of climate change mitigation, and cleaner/resource efficient goods. The latter are goods whose primary use is not for climate change mitigation, but they are less polluting (and thus less harmful for the climate) than equivalent “normal” goods which have the same usage and provide an equivalent service.

Climate change adaptation: The IPCC provides an internationally accepted definition of the concept of climate change adaptation... [which] sets out those climate change adaptation economic activities whose primary purpose is to substantially reduce, moderate or avoid harm in natural and human systems in response to actual or expected climate change and their effects. The climate change adaptation activities are categorized by their purpose: activities that directly serve a climate change adaptation purpose or produce specifically designed products whose use serve a climate change adaptation purpose. The project retains the following 6 purpose categories of economic activities for climate change adaptation: hydrological events: inland water, costal water; climatological events: temperature and droughts; meteorological events: precipitation intensity; meteorological events: wind intensity, other events posing risks to health, ecosystem and soils.



- ❁ IMF Definitions (an outcome of several rounds of consultation with G20 countries):
 - ❁ **Climate change mitigation expenditures** are expenditures for preventing, removing, or reducing the emission of greenhouse gases (GHG) into the atmosphere and enhancing sinks of greenhouse gases.
 - ❁ **Climate change adaptation expenditures** are expenditures on adapting and building resilience of human and ecological systems to the changing climate conditions and minimizing the negative climate change impacts.

- ❁ Where do these definitions leave us? What common threads can we agree to?

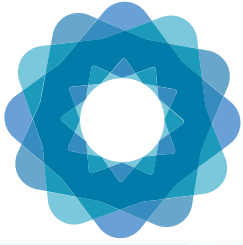


Recommendation 1

Carefully define purpose and prioritize specificity in definitions

Given the SEEA-CF's use of the '**primary purpose**' criterion in defining environmental protection and resource management expenditures, the definitions for climate change mitigation and adaptation expenditures should also, at a minimum, include activities that satisfy a 'primary purpose' criterion.

To the extent '**secondary purpose**' is also used in defining these expenditures, the criteria developed by SEEA-CF should be clear, specific, limited, and understandable for compilers of the accounts to maintain consistency across accounts and for international comparability.

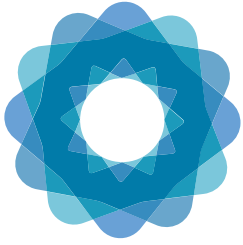


Recommendation 2

Carefully consider the term ‘impact’ (or remove reference of it)

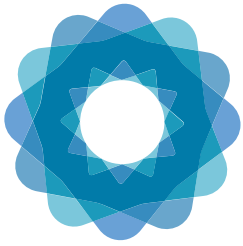
Accurately assessing the climate impact of a particular expenditure in the economy is resource-intensive, requires a time-lag, assumes causality, and is generally outside the scope/expertise of national statistical offices. Thus, assessing impact likely compromises the feasibility of producing consistent and comparable statistics.

If terminology like ‘impact’ is used in the Update, it should be well-defined and clear in the guidance precisely how a national statistical office can measure it, ideally with worked examples from countries that have implemented it in order to demonstrate its feasibility and rigor that goes beyond limited government budget tagging exercises since the statistics are to include all institutional sectors of the economy.



Key definitional issues

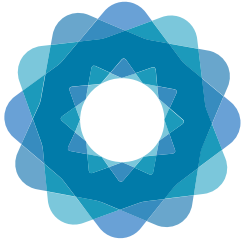
- ❁ Where do we draw the boundaries for **'secondary purpose'**?
 - ❁ Should we count the full product if it fits secondary purpose criteria?
 - ⚙️ **Electric car example**
 - ❁ Should we account for the source of electricity for emissions mitigation of electric (zero emissions) vehicles and products?
- ❁ How narrow or broadly should we interpret the 'normal' or 'standard' product?
 - ❁ **Public transportation example**
- ❁ How should adaptation expenditures account for the baseline?
 - ❁ **Building/infrastructure example**
- ❁ Should we consider the term **'impact'**?



Electric Vehicle (EV) Example

⚙️ Electric cars → **primary purpose** auto transportation

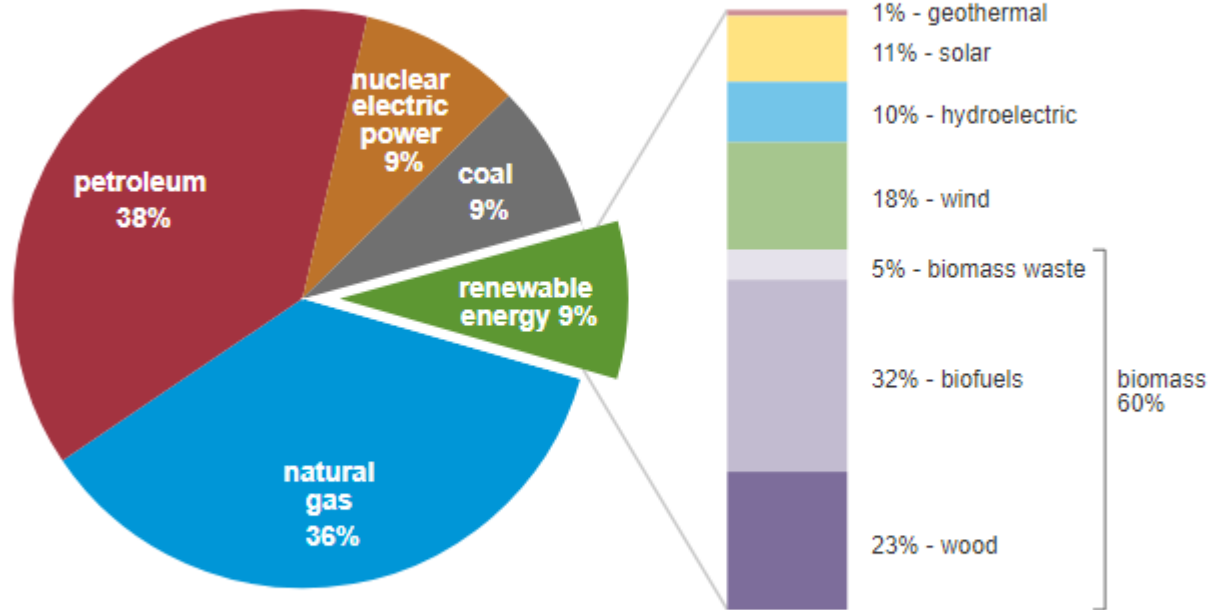
- ⚙️ For EGSS, it falls under the '**secondary purpose**' criterion because they serve as a lower/zero emission version of the default baseline (conventional gas/diesel combustion)
- ⚙️ For both EGSS and CCM, how much of the electric vehicle should be considered “environmental” or “mitigation”?
 - ⚙️ Now: it's “all in” for EGSS
 - ⚙️ SEEA-CF Update: should we consider partial (EV drivetrain, battery, and relevant mitigation components)?
 - ⚙️ Should we consider the source of the electricity?



U.S. primary energy consumption by energy source, 2023

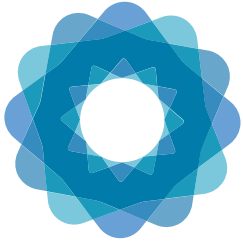
total = 93.59 quadrillion British thermal units

total = 8.24 quadrillion British thermal units



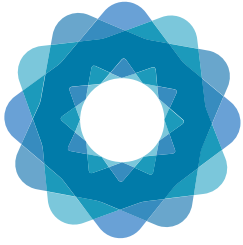
Data source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3 and 10.1, April 2024, preliminary data

Note: Sum of components may not equal 100% because of independent rounding.



Public Transportation Example

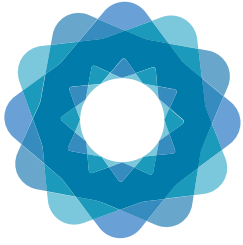
- ❁ If we are considering whether we have a “cleaner” product, how broad do we define the baseline or default option?
- ❁ Public transportation (e.g., busses, light rail, etc.)
 - ❁ **Broad comparison:** transport to transport (e.g., public transport to non-electric autonomous transport)
 - ❁ **Narrow comparison:** mass transit to mass transit (e.g., low/zero emissions busses to diesel busses) ; autonomous transport to autonomous transport (e.g., low/zero emissions cars to conventional gas/diesel cars)
 - ❁ EGSS currently follows the narrower interpretation



Building/Infrastructure Adaptation Example

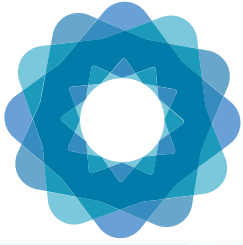
- ✿ Consider a bridge built to higher specifications due to climate change.
 - ✿ The “primary purpose” of the bridge is for transportation, but should we consider the *additional* expenditure above and beyond the old (baseline) standards as climate change adaptation?
 - ✿ The primary purpose of this additional (but not entire) expenditure is climate change related.
 - ✿ Is it the baseline that matters here?
 - ✿ There have always been floods, hurricanes, etc. Adaptation to climate change suggests some incremental, above normal expenditures.
 - ✿ This should be clarified in the SEEA-CF Update, if adopted





Impact?

- ❁ Existing environmental activity accounts (and other thematic accounts) are **purpose-oriented**
- ❁ What if we instead consider impact of the expenditures, rather than its purpose?
 - ❁ Would this be a major departure from SNA and SEEA thematic accounts?
- ❁ Quantifying impact is resource intensive, complex, and causal in nature. NSOs would not be able to do this at scale, as this generally falls outside the scope of what most NSOs do.

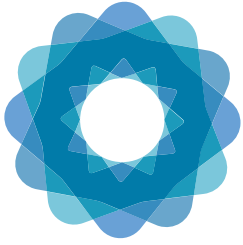


Recommendation 3

Carefully consider recommended data sources and definitional compatibility.

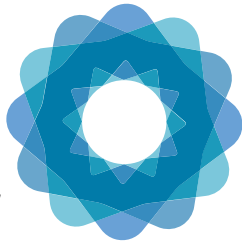
Definitions used in the SEEA-CF Update for climate change mitigation and adaptation expenditures should carefully consider the underlying data sources and the definitions used for generating those data and classifications, providing sufficient guidance and specificity for compilers.

For example, existing Supply-Use Table (SUT) data and classification schemes may have 'primary purpose' criteria that would need to be reconciled with any departures from 'primary purpose' in CCM and CCA definitions. Similarly, ad hoc budget tagging data for public sector expenditures may also use different criteria, which may be inconsistent with the proposed guidance.



Classifications, Methods, and Data

- ❁ Climate change mitigation and adaptation expenditures face common methodological and data issues as existing environmental activity accounts like EGSS
 - ❁ Countries rely on Supply-Use Table source data and survey data, which are generally follow primary purpose definitions for fitting activities within standard product and industry classifications (NAICS, ISIC, NACE)
 - ❁ Products categories often do not correspond neatly with definitions and destination categories for the accounts (requiring other data sources for information about ‘partials’)
 - see EGSS work on this topic
 - ⚙ These challenges can be magnified for new accounts
 - ❁ Public sector “budget tagging” exercises may not follow the same criteria as the definitions in SEEA



How might CCM and CCA fit together within the existing CEP framework and categories?

This is NOT a proposed classification scheme, but Figure 1 in the paper offers an illustrative example based on BEA's work.

Eurostat and IMF have also done work on developing lists for industry/product codes

BEA pilot is in progress.

HUMAN SYSTEMS

CEP categories:

- 0101: Reduction & control of greenhouse gases
- 0201: Energy from renewable sources
- 0202: Energy savings and management

Climate Change Mitigation activities

Include expenditures on:

- 1) Reducing GHG emissions
- 2) Carbon Capture & Sequestration
- 3) Tradeable permits
- 4) Carbon Taxes
- 5) Carbon offsets
- 6) Energy from non-carbon emitting sources (nuclear)

NATURAL SYSTEMS

CEP categories:

- 0501: Protection of soil (excl. surface & ground water)
- 0502: Protection of biodiversity and landscape
- 0503: Management of forest resources

Climate Change Mitigation activities

Include expenditures on:

- 1) Enhancing natural sinks for carbon: i.e., forests, wetlands, soil
- 2) Preventing & combating losses of natural carbon storage systems: i.e., forest fires, insect infestations

Mixed CC Mitigation & Adaptation Activities

includes expenditures on:

- Increase natural systems' resilience for dealing with changes in environmental conditions

HUMAN SYSTEMS

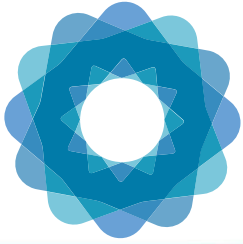
CC Adaptation Expenditures Related to human systems

(NOT part of SEEA EPE/RM accounts)

CC Adaptation Activities

includes expenditures on:

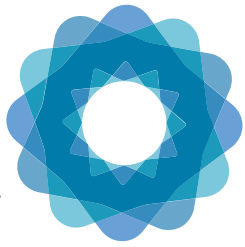
- Increase natural systems' resilience for dealing with changes in environmental conditions



Recommendation 4

Provide very clear guidance on major expenditures.

To the extent that there is any ambiguity in the proposed definitions in the SEEA-CF Update for climate change and adaptation expenditures, clear guidance on “what is in versus what is out” for major expenditures is essential for compilers to produce consistent and comparable estimates.



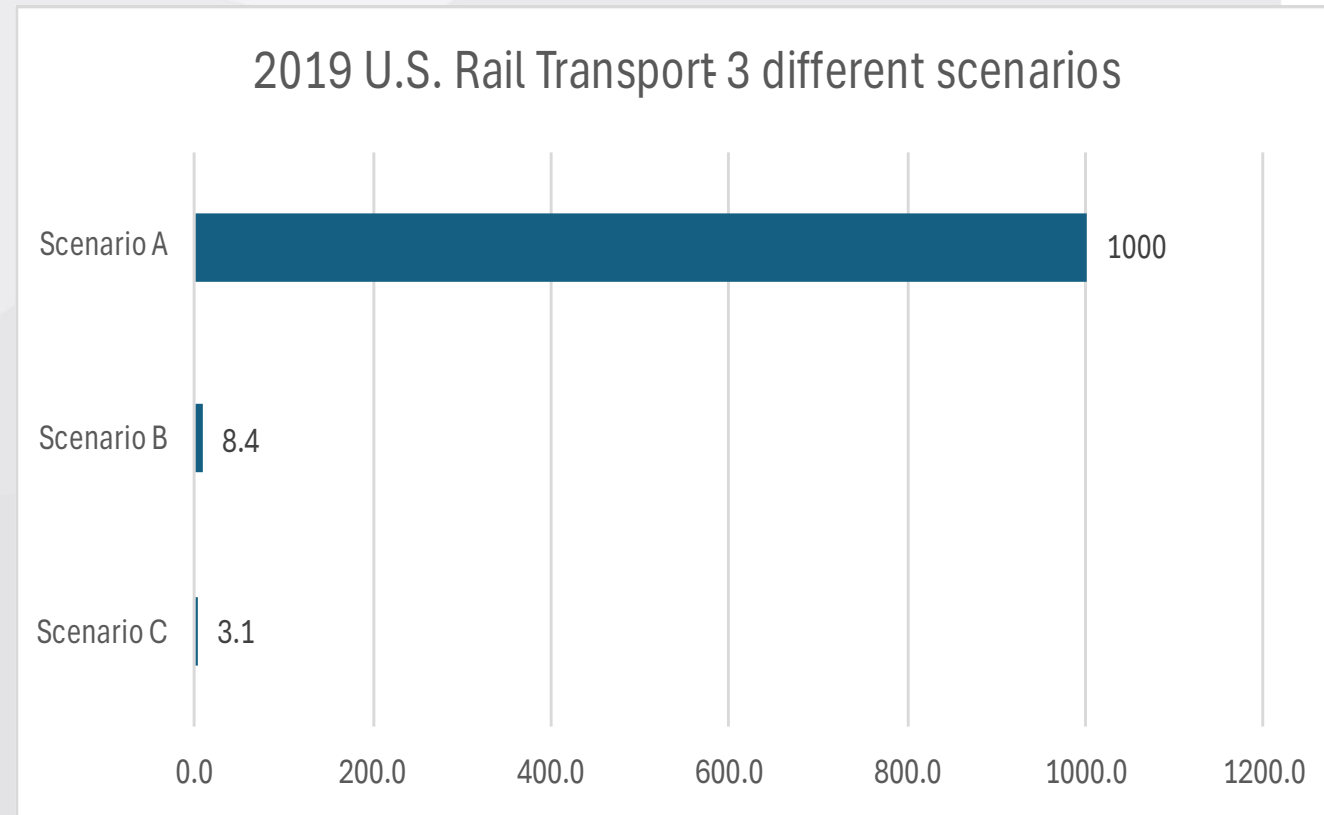
Hypothetical example: Rail

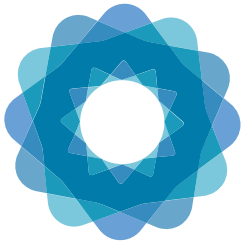
What if there was ambiguity on whether to consider all rail transport?:

- Suppose Rail Transport total = 1000 \$
- Broad interpretation (Scenario A) – include all rail transport
- EU – include portion of all rail transport that is electrified (Scenario B)
- USA – include electrified portion x portion of non-carbon emitting electricity production (C)

USA percent of rail network that is electrified = 0.84%

USA percent of non-carbon emitting electricity production = 37.24%





Accounting Goals

- ⚙️ Consistency across accounts and over time, international comparability, and integrity of the statistics → important goals for any accounting standard
 - 🌸 A statistical standard may not be able to identify every potentially relevant product for a thematic account in a comprehensive list.
 - ⚙️ **Clear guidance on major expenditures** and how they fit within the definitions and boundaries will help account compilers achieve these goals.
 - 🌸 **Clear definitions, rules, and boundaries will be essential** if climate change mitigation and adaptation expenditures are successfully added to the SEEA-CF.



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**System of
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THANK YOU

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