Accounts for physical produced assets

SEEA-CF Revision Guidance Note D.3

SEEA Technical Committee Meeting
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Reminder of motivation

- The short description of issue D3 “Inclusion of accounts for physical produced assets (in the SEEA Central Framework)” from October 2024 is:
  - *A key characteristic of the SEEA is that it looks at physical stocks and flows. Yet physical asset accounts for produced assets are not part of SEEA CF. There in an increasing interest is these kinds of stocks in view of the circular economy and analysis of waste flows (e-waste, recycling potentials, etc.). Other types of accumulations could also be examined (e.g. accumulation of durable household goods).*

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Review of existing material and research

- A key concept in industrial ecology is the “urban mine”, which comprises the stock of materials bound up in:
  - produced assets (buildings, machinery, infrastructure, equipment, etc.)
  - waste products residing in landfill sites or in mine tailings, and
  - so-called “hibernating” products (that is, products no longer in active use by their owners use but also not formally disposed of).
- The urban mine represents a source of valuable materials that can, in principle, be captured and re-used in further economic production

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Measuring the urban mine

- Complex effort focused to date mainly on metals, which are easily recycled and of relatively high value
- Two approaches used:
  - Top-down: Essentially a type of material-specific MFA
    - Accumulation (inflows less outflows) tracked over long periods to measure stocks
    - Very data intensive, though reasonably well-suited to NSOs
    - Yields no information on location of stocks
  - Bottom-up: Material coefficients
    - Stock equals number of items times material content per item (e.g., # of buildings times copper content per building)
    - Requires granular data on items (buildings, machinery, infrastructure) plus accurate coefficients
    - Too data intensive to applied whole-economy; usual done for cities or small regions

Existing guidance in SNA

- Essentially nothing
- Classification of produced assets provides at least a starting point for thinking about what to measure

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Existing guidance in SEEA-CF

- Nothing direct to offer in terms of measuring the stocks associated with the urban mine.
- Does not mean the current handbook is irrelevant
  - much to offer in guidance related to physical flow accounts

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Existing guidance in SEEA-CF

- General framework for physical flow accounts tracks all flows necessary to compile physical measures of produced assets and waste stocks, though it stops short of cumulating those flows into stock estimates
  - Entry of raw materials into the economy
  - Use of these materials in the economy, including their accumulation through gross fixed capital formation and inventory formation and household final consumption
  - Disposal of waste materials
  - In principle, all that is required to create a physical account of produced assets would be to cumulate these flows (net of their deaccumulation, which is also measured) over time starting from a base year

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Existing guidance in SEEA-CF

- Guidance on MFA for specific materials provides a good starting point
- An estimate of base-year stocks is needed
  - Could be done using either top-down or bottom-up approach of industrial ecologists
- Issue of the spatial location of stocks is tricky
  - Users want to know where the materials can be found, but NSOs may not be able to do so
    - Overly resource intensive and potential confidentiality concerns

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Links to other statistical frameworks

- United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources is the official statistical classification of fossil fuel and mineral reserves.
  - Used in the SEEA-CF as the basis for the identification of the mineral and energy reserves

- In 2025, the UNFC was expanded to include additional specifications for the classification of resources coming from anthropogenic sources

- If the decision were made to include accounts the urban mine in the revised SEEA-CF, these new UNFC specifications would seem to be the appropriate choice for the classification of resources

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Conceptual options and treatments

- Issue 1 – Scope of materials included
  - **Option 1a** – Include physical stock accounts only for metals and metallic products
  - **Option 1b** – Include physical accounts for a broader suite of materials (metals and metallic products, glass, plastics, ceramics, wood, concrete, asphalt, bricks, gypsum and insulation materials)
  - **Option 1c** – Include physical accounts for all materials

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Conceptual options and treatments

- Issue 2 - Scope of material reservoirs to be included
  - **Option 2a** – Add a physical stock account for produced assets only
  - **Option 2b** – Add a physical stock account for the entire urban mine
    - Produced assets, waste stocks and hibernating wastes

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Option 1a/2a– Produced assets and metals only

Table 1 - Crude physical stock account for metals in fixed assets, as of December 31, 20XX

Material	Reservoir				
	Buildings and dwellings	Other structures	Transport equipment	ICT equipment	Other machinery and equipment
Copper and alloys					
Iron and alloys					
Aluminum and alloys					
Zinc and alloys					
Nickel and alloys					
Precious metals					
Rare earths					
Etc.					

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Option 1a/2b – All reservoirs and metals only

Table 2 - Crude physical stock account for metals in fixed assets, as of December 31, 20XX

Material	Reservoir							
	Fixed assets					Discarded wastes		
	Buildings and dwellings	Other structures	Transport equipment	ICT equipment	Other machinery and equipment	Landfills	Mine tailings	Hibernating
Copper and alloys								
Iron and alloys								
Aluminum and alloys								
Zinc and alloys								
Nickel and alloys								
Precious metals								
Rare earths								
Etc.								

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Conceptual options and treatments

- Issue 3 - Geographic scope to be included
  – **Option 3a** – Compile the physical stock account only at the national or broad regional (province, state, etc.) level
  – **Option 3b** - Compile the physical stock account only for large cities

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Questions

1. Do you agree that the revised SEEA should include guidance for physical material stock accounts?
2. If yes, what scope of material should be covered (Issue 1 in the Guidance Note):
   - only metals and metallic materials
   - broader, but not comprehensive, suite of materials
   - all materials
3. If yes, what scope of reservoirs should be covered (Issue 2 in the Guidance Note):
   - Produced assets only
   - Produced assets, landfills and other stocks of waste, hibernating wastes
4. If yes, what geographic scope should be covered (Issue 3 in the Guidance Note):
   - National
   - Large cities only

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Thanks

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