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Outcome Paper for Global Consultation

Issue #3b: Boundary issues in air emission accounts[1]

Carl Obst
SEEA Editor

[1] This outcome paper has been prepared by the SEEA Editor. It is based on papers presented to the London Group of Experts on Environmental Accounting and discussions among those experts. Investigation and research for this outcome paper was led by Ole Gravgard of Statistics Denmark.

A. Introduction

1. Air emission accounts have been a long-standing area of interest for environmental accounts. Most focus in recent times has been on the extent of carbon emissions to the atmosphere but historically there has been interest in a wide range of substances that are emitted to the air as a by-product of economic activity.

2. In the process of revising the System of Environmental and Economic Accounts (SEEA) it has been recognised that a range of boundary issues concerning air emissions had arisen over time relating to exactly which emissions and activities should define the scope of air emission accounts. This matter is particularly relevant in the consideration of international calculations of greenhouse gas (GHG) emissions as calculated under the Intergovernmental Panel on Climate Change (IPCC) process. Given the importance of IPCC data it is relevant that the definitions and scope of SEEA and the IPCC in relation to GHG emissions be clarified.

3. In part this is a matter for the development of bridge tables which explain the linkages between SEEA air emission accounts data and IPCC GHG emissions data and this topic is discussed at more length under SEEA Revision Issue #3a: Bridge tables in the revised SEEA.

4. In this paper the discussion seeks to clarify more precisely the boundary for SEEA air emission accounts for GHG and other emissions. The paper is structured to consider a number of boundary issues that were raised through London Group discussion of this topic and a range of recommendations are made through the paper.

B. Accumulation of emissions

Biomass and soil

5. Carbon accumulates in living biomass, including forests, and soils. It was concluded that, in general, these increases in carbon in cultivated and uncultivated living biomass and soils should not be recorded in the emission accounts of SEEA Volume 1, except

> (i) for biomass defined to be timber resources (see SEEA Revision Issue #21: Forests) and
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> (ii) when necessary for establishing bridge tables, for example bridge tables to IPCC emission inventories, in which case the recording of appropriate memorandum items may be applicable.

6. A full description and accounting for the carbon cycle should be included in the revised SEEA Volume 2 as part of the more general discussion in the volume on ecosystem accounting.

Recommendation 3b.1: That, in the revised SEEA Volume 1, the accumulation of carbon emissions in living biomass and soils should not be recorded except for the accumulation of carbon in timber resources and when necessary for the compilation of bridge tables.

Carbon capture and storage

7. There is an increasing range of situations in which carbon emissions are being captured and then stored rather than being released to the atmosphere. The conclusion of the London Group was that where the storage facility could be considered to be within the economy – largely based on the degree of control over the storage – the captured emissions should be considered a flow within the economy. They should be recorded as leading to a net reduction in emissions and should be recorded separately from other emissions, possible by distinguishing the receiving media.

Recommendation 3b.2: That, in the revised SEEA, the air emission accounts should record emissions that are captured and stored where there is a reasonable degree of control over the storage facility.

C. Release of emissions

8. Before discussing various boundary issues associated with the release of emissions due to economic activity, some background is required concerning how the release of emissions should be recorded. In general, the boundary issues associated with the release of emissions are related to emissions that have been stored for some time and are hence embodied in various assets and other goods. This is distinct from emissions that occur as a direct result of economic activity, for example, carbon emissions from the burning of fossil fuel when driving a car. Generally these direct emissions can be easily attributed to the emitting user or producer. However, attribution of emissions embodied in assets may not be obvious.

9. Nonetheless following standard national accounts recording it is possible to record the emissions as coming from various assets and goods and also attributing the emissions to a relevant user or producer by looking at the ownership profile of the assets and goods themselves. Thus, in general, emissions should be recorded against the owner of the asset that is the source of the emissions. This statement is considered further in the following cases.

Burning of biomass

10. It is considered that emissions from the burning of biomass, through, for example the burning of fuel wood, as well as the burning of forests and grasslands should be included in the SEEA air emission accounts. In relation to the burning of forests and grasslands the inclusion of unintended forest and grassland fires, for example those due to lightning strike, was discussed with the conclusion that unintended fires should be within scope of emissions.

11. Emissions from cultivated forests (e.g. VOC) should be included in the emission accounts in Volume 1 as resulting from the capital/inventories category and attributed to the owning industry, usually forestry production.

Recommendation 3b.3: That in the revised SEEA all air emissions from the burning of biomass should be recorded in the air emission accounts including emissions from unintended forest and grassland fires.

Capital equipment and consumer durables

12. There are various air emissions, including carbon, from capital equipment and other durables such as refrigerators, air conditioners, fire extinguishers and insulation materials, etc. Where these are produced on an ongoing basis over the life of the equipment they should be included in the air emission accounts.

13. While these emissions occur on an ongoing basis, the observation of transactions in these types of equipment usually occurs either at the time of purchase or the time of disposal and hence emissions may be recorded at either of these times rather than on an ongoing basis over the life of the equipment. It is recommended that in principle emissions should be recorded at the time the emissions take place and hence the emissions should be distributed over the life of the equipment rather than recorded at the time of acquisition or disposal.

14. For equipment that is treated as capital equipment in the System of National Accounts (SNA) the allocation of emissions over the life of the asset is in broad terms not dissimilar from the recognition of the cost of deprecation against the same assets. However, consumer durables including cars, refrigerators and televisions, are considered in the SNA to be consumed when purchased even though they will have a life longer than one accounting

period. Consequently, recording emissions over the life of a consumer durable implies recording emissions against something that has already been fully consumed in an accounting sense.

15. Thus, for the purposes of comparing physical estimates of air emissions with monetary data based on the SNA (hybrid accounting) it is necessary to align the two information sources either by adopting an alternative treatment of air emissions based on time of purchase or by adopting an alternative recording of consumer durables in which they are accounted for in the same way as assets with an operating life and declining values over time. This recording of consumer durables is suggested as a memorandum item in the 2008 SNA and hence it is recommended that for the revised SEEA this alternative recording of consumer durables be adopted for the purposes of hybrid accounting for air emissions.

16. Finally, it is noted that as these emissions relate to emissions from past production there is not an immediate link between the measured outputs and inputs represented in the supply and use tables and the level of emissions. Nonetheless, as discussed above, since the ownership of the capital equipment and consumer durables is known, the emissions can be attributed to the owning industry or sector and added to the emissions from other sources. It may be useful to record the emissions as coming from capital/inventories rather than from current production.

Recommendation 3b.4: That in the revised SEEA air emissions from capital equipment and consumer durables should be recorded on an ongoing basis over the life of the equipment.

Recommendation 3b.5: That for the purposes of hybrid accounting for air emissions, consumer durables should be accounted for as being consumed over their operating life rather than at the time of purchase.

Controlled landfills and carbon storage facilities

17. Emissions from controlled landfills should be included in the emission accounts in Volume 1 and attributed to the waste management industries. It is noted that these emissions should be considered to be coming from capital/inventories.

18. Any leakages from carbon storage facilities should be treated as flows from the economy to the environment and be considered to be coming from the capital/inventories category. They should be assigned to the owner or manager of the controlled storage facility.

Recommendation 3b.6: That in the revised SEEA, air emissions from controlled landfills and carbon storage facilities should be recorded in the air emission accounts.

Emissions from natural processes

19. In general, emissions from natural processes (for example, carbon and sulphur emissions from volcanoes) are not recorded in the emission accounts in SEEA Volume 1. However emissions from nature are relevant in the context of ecosystem accounts (e.g. carbon cycles, water) to provide a full picture of carbon accounting in the revised SEEA Volume 2. Transboundary emission flows should be presented in the emission accounts (as entries concerning the Rest of the World) as memorandum items.

20. Emissions from enteric fermentation are emissions of gases related to the digestion processes of livestock and humans. In principle, these emissions should be included in the emission accounts of SEEA Volume 1 although in practice data availability may limit the ability to accurately estimate these flows.

Recommendation 3b.7: That, in the revised SEEA, air emissions from natural processes should be excluded from the SEEA air emission accounts except for emissions due to enteric fermentation of livestock and humans.

D. Recording emissions in gross or net terms.

21. This issue concerns the point at which emissions should be recorded as entering the environment. The practical issue is that emissions from particular economic activities may be processed or treated further by other economic processes (either within or outside the first emitting unit) and hence it would be possible to record both sets of emissions – i.e. before and after treatment (gross recording) or only those emissions that enter the environment (net recording). It is noted that consistent gross recording requires the compilation of both supply and use tables for emissions.

22. The conclusions from the London Group discussion were that

- If emissions undergo treatment within the same establishment, only the emissions that are released in the environment should be recorded in the accounts.
- If there is another economic activity that treats the emission, then both the emissions that are transferred within the economy and those that go back to the environment should be recorded.

23. It was also noted that in some cases there is the production of secondary emissions that occur when primary emissions that have been released into the atmosphere from the economy undergo chemical reactions to create different types of emissions. It was concluded that in the revised SEEA the emissions should only monitor the primary emissions that are released from the economy. However, a discussion on secondary emissions could be considered for inclusion in a discussion on applications of the SEEA.

Recommendation 3b.8: That in the revised SEEA, air emissions should be recorded when they enter the environment and the production of secondary emissions should not be recorded. Air emissions transferred within the economy should be recorded.