

1. We suggest the term “ecosystem inputs,” used for the subset of natural inputs that includes gases and soil nutrients, be replaced with the term “Gaseous and soil nutrient inputs” (or another appropriate term). The bound for classifying a given material as an “ecosystem input” is not described in the chapter, nor is it self-evident, in part because the term “ecosystem” itself is not defined. It is our understanding that the Experimental Ecosystem Accounts will define the necessary bounds for classification of ecosystems, and hence, for clarity, we suggest that the term “ecosystem” be reserved for exclusive reference to the contents of the Experimental Ecosystem Accounts (as in §91, for example) and eliminated from other paragraphs, such as §43.

In addition, the term “ecosystem inputs” is also problematic because one may infer that the processes that use the gases as inputs are to be considered ecosystems. (This inference is facilitated by the lack of a definition for ecosystems.) However, it is clear that many of the processes within the bounds of the economy that use gases as inputs should not be considered ecosystems. For example, combustion in a coal-fired power plant requires oxygen as an input. In addition, cultivated biological resources that use gases and soil nutrients as inputs could conceivably be classified as ecosystems. But at the same time they are within the bounds of the economy (see §39-44). Hence this classification for “ecosystem” means that, for example, conversion of natural growth forest to farmland entails no change in the total amount of ecosystem , and an increase in the size of the economy.

Perhaps the term “ecosystem inputs” is used because gases and soil nutrients are thought to be the exclusive outputs from ecosystems. This however is false, since many of these materials are produced by the earth in the absence of life (O₂ and CO₂, N₂ for example).

2. The definition of natural resource residuals given in §59 is inconsistent with the “general material balance principle” described in §25. Specifically, because residuals are defined as “incidental and undesirable flows” in §59, there is no place for neutral or desirable flows to the environment. Because desirable or neutral outflows to the environment are not counted, we may have more material inflows into the economy than material outflows and accumulation. In order to maintain consistency with the “general material balance principle” we suggest that the definition of residuals given in §59 be altered to omit the “undesirability” standard. This could be done rather simply as follows: “Residuals are the flows that are discarded, discharged or emitted by businesses and households through processes of production, consumption or accumulation.” This definition permits, for example, “neutral” O₂ flows into the environment to be counted as residuals.

For example, consider cultivated horticulture (or “crops”). The process in inside the bounds of the economy as described in §39-44. The material flows into the economy are CO₂, water and soil nutrients. But oxygen is created and emitted back into the atmosphere as a result of this extraction activity (resulting from photosynthesis). However there is no place for this oxygen emission in the proposed classification of residuals, because all residuals are “undesirable”. (See also §81, where all emissions to air are characterized as “pollutants,” and tables 3.2.5 and 3.6.1, where all stated examples of air emissions are all known pollutants.). Note that under the previous issue paper on classification of physical flows, there was no “undesirability” standard attached to the definition of emissions to air (see paragraph 43 in that paper.) There is also no “undesirability” standard in the discussion of air emissions in §206.

We recognize that policy-makers need to distinguish the environmentally bad flows from other neutral flows. But the material balance principle requires that the definition of residuals be expanded to include these “neutral” or “good” flows. Perhaps an additional classification is required, and some additional examples are required in table 3.2.5. These neutral flows would also need to be incorporated into standard tables if they are to be incorporated into the SEEA.