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**SEEA-Energy Expert Group Meeting
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**Present state of alignment between SEEA-Energy and the central
framework of the SEEA**

Paper prepared by UNSD

(for discussion)

State of alignment between SEEA-Energy and the SEEA central framework

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A. Introduction

Draft chapters of SEEA-Energy were written early in 2011 and since then drafting of chapters making up the central framework if the SEEA has progressed rapidly. The purpose of this document is to provide a summary of where these two documents have diverged in recent months and to facilitate discussions of how best to build and maintain alignment between SEEA and SEEA-Energy. These documents could diverge in any number of ways: but of most concern is that the two documents reflect a consistent purpose and consistent principles and methodologies. Accordingly, this note focuses on where differences between SEEA and SEEA-Energy reflect significant differences in concepts, methodologies or principles.

It is highly desirable that SEEA and SEEA-Energy are consistent in their style and approach e.g. target audience, tone, emphasis, table formats, chapter detail and so on. However, there are reasons why the two documents will differ. SEEA as the overarching framework might generally be more inclusive of assets and flows – especially in light of SEEA’s need to accommodate ecosystem accounting in its second volume. SEEA-Energy as a document is directly focused on supporting the production of achievable and meaningful energy accounts by national statistical agencies – accounts that must be reliable to energy statistics and energy balances.

Generally speaking, SEEA-Energy might provide greater detail on such things as classifications and technical descriptions of certain principles and methods. SEEA-Energy should be expected to provide more detail on specific policy-related aspects of the use of energy accounts. There is a case for SEEA-Energy simply referring to the SEEA for a whole range of items i.e. unless the SEEA-Energy is extending the discussion or applying it in a very specific manner. Nevertheless, the focus of this note is essentially on differences between SEEA and SEEA-Energy in concepts, methodologies and/or principles.

B. SEEA and SEEA-Energy: listing of significant concordance issues

The following listing describes significant differences of concept, methodology or principle between SEEA and SEEA-Energy. Valid reasons may exist for certain divergences between SEEA and SEEA-Energy; however, the general expectation is that differences would need to be resolved.

Chapter 1: Introduction

Target audience

It is unclear whether SEEA and SEEA-Energy target the same audience; mainly this is because neither document is explicit about its target audience. The target audience of these two frameworks needs to be either the same or at least complementary. This is a question that can better be answered after the meetings of the SEEA Editorial Board on 15 and 16 September 2011 and the Expert Group on SEEA-Energy on 5-7 October 2011.

Relationship to related manuals

SEEA-Energy needs to describe its relationship to other relevant frameworks, manuals and International recommendations (SEEA; IRES; Energy Balances; 2008 SNA, Energy Statistics Compilers Manual etc.). A presentation made by the Oslo Group (Elisabeth Isaksen) to the London Group in September 2011 provides a roadmap to describe the relationships.

http://unstats.un.org/unsd/envaccounting/londongroup/meeting17/LG17_10c.ppt

Chapter 2: The SEEA-Energy Framework

Meaning of 'economy' and 'environment'

Need consistent explanation of the shorthand terms 'economy' and 'environment' in SEEA-Energy and SEEA. That is, what exactly do these terms mean when we talk about flows between the economy and the environment; and also when we are describing environmental assets and (more narrowly) those assets that reside within the economy? (In fact, no inconsistencies are evident - it is simply suggested that an explanation needs to appear in both SEEA and SEEA-Energy.)

General accounting rules and principles

SEEA explains a number of accounting rules and principles (stocks, flows, economic units, double and quadruple entry accounting etc.) which SEEA-Energy might usefully adopt.

Overview of main types of tables used

A generic description of supply and use tables could be added to Chapter 2 of SEEA-Energy.

Scope of emissions: energy-related air emissions

SEEA-Energy currently states up-front that SEEA and SEEA-Energy differ because the latter excludes emissions to air arising from energy use. This difference follows a specific direction from UNCEEA to exclude emissions to air from SEEA-Energy. It in no way precludes a user from using the SEEA-Energy framework to undertake analyses of energy-related emissions to air (a purpose that SEEA-Energy remains ideally suited to).

Chapter 3: Physical Asset Accounts

SEEA assets defined

The general definition of an asset should be the same in SEEA and in SEEA-Energy. There is a need for precision in (separately) defining environmental assets and economic assets – see also the entry in Chapter 2 *Meaning of ‘economy’ and ‘environment’*.

‘Infinite’ renewable energy resources

SEEA-Energy excludes energy assets related to ‘infinite’ renewable energy resources (paragraph 2.34), something that SEEA includes in principle (without exhaustively defining such assets). ‘Finite’ renewable resources might be defined as those where the underlying resources are subject to depletion, for example, wood for combustion. If a distinction between types of renewable resources is considered useful, it needs to be explicit and needs to be accompanied by a description of any related differences; e.g. that SEEA-Energy shows flows of renewable energy only in the form of output of products (discussed further in Chapter 5 comments below).

SEEA-Energy correspondence to SEEA Classification of Natural Resources

Table 3.1 of Chapter 3 in SEEA-Energy presents a classification of energy resources and its correspondence to the overall SEEA classification of natural resources. In the latest version of *Chapter 5 Asset Accounts* of the SEEA only a very broad picture of SEEA assets is presented within the central framework (which aligns with the classification that’s in SEEA-Energy). Is the classification used in Table 3.1 sufficiently detailed for our needs?

Do Mineral and Energy Assets include related product inventories?

Should ‘Mineral and Energy Resources’ in the *SEEA Classification of Environmental Assets in the SEEA Central framework* include related inventories? Clearly, these are also assets, but they are produced assets (unlike natural resources). The question perhaps is: should product inventories be considered environmental assets?

Chapter 4: Monetary Asset Accounts

Monetary energy assets: commercial and potential resources?

Should monetary energy assets include both ‘Commercial’ and ‘Potential’ resources? Within Table 4.1 of Chapter 4 of draft SEEA-Energy, the SEEA-Energy classification

category lists ‘A. Commercial Energy Resources’; ‘B. Potential Commercial Energy Resources’; and ‘C. Non Commercial and Other Known Deposits’. Following global consultation, it was decided that the draft central framework of the SEEA should include ‘Potential’ as well as ‘Commercial’ resources in defining economic assets. However, the latest position is that the SEEA definition extends only to include ‘Commercial’ resources and that therefore SEEA and SEEA-Energy are in alignment.

NPV techniques applied to all components of physical changes in stock levels

At present SEEA and SEEA-Energy are not using entirely the same approach to the NPV measurement of monetary value of energy resources. The central framework of the SEEA and SEEA-Energy both recommend valuation of energy resources using NPV (where market values are unavailable). The latest update is that SEEA and SEEA-Energy will be brought into alignment i.e. the SEEA will develop an NPV model in which all components of physical changes in stock levels (discoveries, reappraisals etc.) are valued through the NPV asset valuation model. This is the approach first developed with SEEA-Energy and (now) being taken up by SEEA. Any refinements to this approach incorporated into the SEEA will then also be reflected in SEEA-Energy. This alignment issue therefore appears to be moving towards a satisfactory resolution.

NPV techniques used in the valuation of energy resources

SEEA points to five key components of its NPV model (in Section 5.4.4). The following table compares the SEEA and SEEA-Energy across each of these five key aspects of NPV measurement and notes differences.

| Component of NPV model | SEEA | SEEA-Energy |
|--|---|--|
| 1. Returns on environmental asset | No mention of special treatment of resource-specific taxes and subsidies on production | Assumes that taxes and subsidies are included in intermediate consumption. Recommends removing resource-specific taxes less subsidies in derivation of resource rent (RR) - tending to increase the size of RR |
| 2. Expected pattern of future resource rents | Assumes continuation of existing resource rent and extraction pattern <i>unless</i> evidence to contrary. | Much the same as SEEA but greater emphasis on attempting to map future extractions and resource rents. |
| 3. Asset life | Asset life should be based more on immediate past experience rather than on assumed improvements in efficiencies etc. | Basically consistent with SEEA. |

| | | |
|--------------------------------------|---|--|
| 4. Rate of return on produced assets | Prefer industry specific rate of return, rather than general rate of return. | Prefer industry specific rate of return, rather than general rate of return. |
| 5. Discount rate | Market-based discount rate i.e. rate should approximate the expected return on the natural asset. | Market-based discount rate. |

Treatment of specific taxes less subsidies in derivation of resource rent

The suggested treatment of *specific taxes less subsidies* at paragraph 4.41 of SEEA-Energy appears inconsistent with the general approach used in SEEA (noting that draft SEEA does not explicitly address this question).

Singular version of resource rent

Para 4.44 of SEEA-Energy proposes two versions of resource rent reflecting some indecision over the treatment of specific taxes and subsidies on production (see point immediately above) – this will be changed to the required singular recommendation when this issue is decided.

Joint ownership of energy resources

This is not mentioned in SEEA-Energy but it can be an important issue for countries where the government receives payment from extractors in relation to mineral and energy resources. It is particularly important for the SEEA which aims to record the depletion of these resources against the accounts of the extractor and to show the effect of depletion on the net worth of the economic owners reflecting that both are beneficiaries of the resources. Under certain defined circumstances, the central framework of the SEEA recommends partitioning of assets based on their share of the future stream of resource rent.

Chapter 5: Physical Flow Accounts

Format of the tables

SEEA-Energy tables follow a different format to those presented in SEEA. They are a simpler version of the tables in SEEA and are closer in format to the tables of SEEA-Water (and of the energy balances). For example, the supply and use tables of SEEA-Energy do not include the environment as an agent alongside industries and households and as a consequence the supply table does not include the block presenting flows of natural inputs.

The differences between standard supply and use tables in SEEA and SEEA-Energy are not huge, but there are some differences – as summarized in the following table:

| | |
|------|-------------|
| SEEA | SEEA-Energy |
|------|-------------|

| (e.g. SEEA Table 3.4.1) | (e.g. SEEA-Energy Tables 5.3 & 5.4) |
|--|---|
| Supply includes ‘Natural resource inputs’ – and ‘non-fuel energy inputs’ (i.e. renewables) | Energy resources are shown as “gross extractions from the environment” |
| ‘Environment’ is shown as a separate column alongside Households, Industries etc. | No column for ‘environment’. Instead, energy resources grouped according to whether the relevant flow occurred to/from the economy or the environment; or within the economy. |
| Explicit stand-alone recording of transformations for each type of energy product and by industry. | Energy transformations are not grouped within one block of the tables – but are nevertheless readily derivable from standard tables in SEEA-Energy. |

When deciding what table format to use in SEEA-Energy we are obviously concerned to use something that is logical and useful to data users. We also desire that the format used in SEEA-Energy is compatible with SEEA; energy balances/IRES and with SNA. Inevitably, it cannot always be all these things and choices must be made.

Double-counting of physical energy flows

SEEA-Energy proposes an additional alternative recording to highlight and remove double counting related to energy transformations – see SEEA-Energy Table 5.13 to 5.15. This appears to be an acceptable difference between SEEA and SEEA-Energy – in fact, in this case it is more a case of SEEA-Energy providing an extension to SEEA, rather than constituting a difference.

Treatment of physical flows of renewable energy

SEEA-Energy shows flows of renewable energy only in the form of output of products. In contrast, SEEA shows flows of renewable energy as ‘Inputs from renewable energy sources’ (i.e. a component of natural resource inputs).

Defining renewable energy assets and flows

Should a uniform and formal definition of renewable energy products be developed that is applicable to both SEEA and SEEA-Energy? Neither framework has a definition at present - the inconsistencies in their undefined and partial approaches are evident elsewhere in this listing. (Nor does IRES comprehensively answer this question, in part because IRES does not deal with monetary aspects of these assets and flows.) For example, SEEA (paragraph 3.147) includes the renewables solar, wind and hydropower as examples of flows of energy resources. SEEA-Energy doesn’t. (Confusion is inevitable without clear and workable definitions.) This item needs to be linked to the earlier discussion of infinite renewable resources in SEEA-Energy chapter 3.

Treatment of nuclear energy

The question here is one of what entries should be recorded to reflect energy flows related to nuclear energy? Within SEEA-Energy nuclear energy is presently only

reflected as the output of electricity / heat (though SEEA-Energy table 5.2 records uranium as an energy resource extracted from the environment) i.e. consistent with the treatment within energy statistics.

Losses due to theft

SEEA-Energy describes losses due to theft as a distinct type of physical loss – however, because there has been no loss from the economy to the environment (such flows stay within the economy) is it accurate to describe them as a physical loss? On a related matter SEEA-Energy (paragraph 5.30) contains a relevant passage describing apparent losses (e.g. inaccurate meters etc.) and this should be retained, though it should be made clear that this is a compilation issue and not a question of concept.

Consistent reconciliation of CPC and SIEC

The Standard International Energy Classification (SIEC) is being used in SEEA and SEEA-Energy for physical flows of energy products (and for inventories of products in the asset account). Both documents are currently proposing to use the Central Product Classification (CPC) for monetary flows of such products. Therefore SEEA and SEEA-Energy should mention the lack of complete correspondence between SIEC and CPC and that countries will need to work around this.

Residuals, waste and losses

General discussion of residuals, waste and losses should be consistent between SEEA and SEEA-Energy – this area has evolved over the past few months. One point that should be made in SEEA-Energy is that there is no single classification for all residuals – residuals overlap and there is no clear way to avoid double-counting of residuals in all their forms. (SEEA paragraph 3.102)

SEEA presently has no definition of residual heat, an area that SEEA-Energy might provide leadership on. More generally there are issues in this area in linking residual heat, transformation losses and on to measures of energy use.

The issue of recording of waste should also be discussed. Within SEEA-Energy, waste used for energy purposes should be recorded as part of own account production, if no monetary transaction takes place.

Re-absorption of residuals

SEEA provides for the possibility of recording the re-absorption of residuals by the economy. This would occur for example in response to an oil spill cleanup. SEEA-Energy does not discuss this. Should SEEA-Energy include some text on re-absorption of residuals?

Treatment of mining overburden

SEEA recommends that recording the extraction of mineral and energy resources should include the mining overburden. The quantity of overburden extracted, together with what becomes the energy product, is then returned as a residual in the item ‘natural resource residuals’.

Chapter 6: Monetary and Hybrid Flow Accounts

Consistent with terminology now being used in the SEEA, should this chapter now be called Chapter 6: Monetary Flow Accounts and Combined Physical and Monetary Presentations?

Tradable permits to emit carbon

SEEA-Energy should include the discussion contained in SEEA relating to treatment of tradable permits to emit carbon. (It is not relevant that within SEEA-Energy emissions to air are out of scope. Such emissions are out of scope of the SNA, for example.)

Terminal and remedial costs

SEEA-Energy reflects purely the 2008 SNA text at present and needs to incorporate the latest text from SEEA (which considers a number of extensions that do not feature in the 2008 SNA).

G. Environmental Activities and Expenditures

This area has moved forward and settled considerably within SEEA over the past few months. The general approach used in SEEA could usefully be adopted in SEEA-Energy. The differences are relatively minor and complete consistency will be easy to achieve. The following action points will deliver consistency between SEEA and SEEA-Energy in this area:

- Update paragraph 6.133 of SEEA-Energy to formally specify 4 groups of environmental activities (as per SEEA Chapter 4, paragraph 12).
- Use the SEEA definition (paragraph 17, Chapter 4) of environmental protection activities, and accordingly replace Table 6.16 of SEEA-Energy with the more comprehensive Table 4.2.2 from SEEA.
- Comprehensively set out both supply and use sides of the Environmental Expenditures i.e. show

(a) EPEA, *supply* of Environmental Protection services (see Table 4.3.1 of SEEA)

[Suggest this involves replacing paragraphs 6.138 – 6.146 of SEEA-Energy with Section 4.2.5 Environmental Goods and Services (paragraphs 29 – 33)], and

(b) *Use* of EPE; expenditure on EP, capital formation, valuation of adapted / connected products – culminating in derivation of National Expenditure on Environmental Protection. The latter section (on producers) complements the earlier discussion of activities, goods and services.

[Suggest use SEEA Section 4.2.6 Environmental Producers (paragraphs 34 – 39)]

Chapter 7: Presentation and Use of Energy Accounts

SEEA-Energy necessarily pre-empts the ‘Applications’ volume of SEEA. Consequently, are there any guidelines that either SEEA or SEEA-Energy should observe?

Annexes and Glossary

Terminology and definition

In places, the terminology and definitions in SEEA-Energy differ from those of SEEA, for example, SEEA-Energy avoids use of terms ‘Final use’ (or final demand) and ‘final consumption’ because the term ‘final’ has a different meaning in energy statistics and balances. To what extent should terminology and definitions be aligned?