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**SEEA-ENERGY: PROGRESS REPORT**

Paper prepared by UNSD

*(for discussion)*

# SEEA-Energy: Progress Report

Prepared by UNSD  
UNCEEA meeting, New York, 24-26 June 2009

## A. Introduction

1. Energy accounts have been identified by the UN Committee of Experts on Environmental-Economic Accounting (UNCEEA) as an important domain of environmental-economic accounting. The UNCEEA has supported UNSD's plan to prepare a publication on energy accounts, *System of Environmental-Economic Accounting for Energy* (SEEA-E), which will present standard concepts, definitions, classifications, accounting rules, and tables for energy accounts.
2. At the third UNCEEA meeting in June 2008 the UNCEEA approved the scope and coverage of the SEEA-E<sup>1</sup> and the draft annotated outline presented in Annex I.
3. Further, the UNSD under the auspices of the UNCEEA undertook a Global Assessment of Energy Accounts in 2008, in order to obtain an in-depth understanding of country practices in the compilation of energy accounts for use in developing both the SEEA-Energy and a technical cooperation programme. The full report is available on the UNSD website<sup>2</sup> and the main findings are summarized in Section B.
4. This paper presents the main conclusions of the global assessment in Section B, and the progress of work in resolving the list of issues for the SEEA-Energy and of drafting the Chapters in Section C. Section D presents a revised timeline for the SEEA-Energy and Section E lists questions for the UNCEEA.

## B. Global Assessment of Energy Accounts

5. The Global Assessment of Energy Accounts was conducted in 2008, and the results were reported in February 2009 to the 40th Session of the United Nations Statistical Commission (UNSC). The assessment had three objectives: (a) to obtain an in-depth understanding of country practices in the compilation of energy accounts; (b) to contribute to the development of the System of Environmental-Economic Accounting for Energy (SEEA-E); and (c) to assist with the development of targeted technical cooperation activities in this area. The paragraphs that follow briefly summarize some of the key findings of the report, which is also provided as a background document for the meeting.

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<sup>1</sup> See SEEA-Energy: Process leading to the publication, Paper prepared by UNSD for the Third meeting of the Committee of Experts on Environmental-Economic Accounting, New York June 24-26, 2009. ESA/STAT/AC.157.

<sup>2</sup> Report of the Global Assessment of Energy Accounts:  
<http://unstats.un.org/unsd/envaccounting/ceea/surveyEEA.asp>

6. Approximately 20 of the 38 responding countries compile energy accounts - comprising energy asset accounts and energy flow accounts in physical and/or monetary terms - on a regular basis. In addition 5 responding countries plan to start compiling energy accounts within the next two years, and 12 among the countries that compile them plan to expand their existing accounts.
7. The integration of physical information in the energy accounts as well as the compilation of monetary accounts are the domains of national statistical offices (NSOs), as opposed to the collection of basic statistics and the compilation of energy balances, in which other agencies play a significant role.
8. The lack of agreed-upon methodology was ranked as one of the most pressing impeding factors in the implementation of energy accounts. This was substantiated by the answers received from countries on specific compilation questions: the definitions and classifications used for energy resources and energy products as well as the valuation methods used vary considerable across countries.
9. The definition of reserves used for the compilation of asset accounts varies widely across countries. There is convergence of country practices with regard to using a definition that is broader than proven reserves, but different terminologies and different definitions seem to be used, making the cross-country comparisons difficult.
10. The methods used for the valuation of energy reserves, which are often reported in the national accounts balance sheet, vary considerably across countries. Although the net present value (NPV), as recommended by the SNA, is the most-often applied method, other methods are still used. Further, the underlying assumptions for the calculation of NPV (e.g. discount rates used, resource rent calculations etc.) differ across countries. Decommissioning costs, which the 2008 SNA recommends recording, are only calculated by one of the responding countries.
11. The classifications of energy products used, as well as the recording of losses and the recording of energy products used as inputs in the production of energy, also vary considerably across countries. Renewable energy sources are recorded explicitly in the energy flow accounts of a large number of respondents. This is expected to increase given the policy relevance of this information, especially when linked to the investments being made for renewable energy technology.
12. The number of countries compiling energy accounts is expected to increase as a result of the increasing policy relevance of linking energy statistics to economic information, particularly in the context of climate change policy analysis. Further, the completion of the standard methodology for energy accounts of the SEEA-E and the International Recommendations for Energy Statistics (IRES), as well as the on-going efforts to harmonize the energy statistics questionnaires, will promote the development of basic energy statistics consistent with the concepts of the national accounts. This will facilitate their integration into the energy accounts.

### **C. Current status of the preparation of the SEEA-E**

13. The United Nations Statistics Division (UNSD) has included the drafting of the *System of Environmental-Economic Accounting for Energy* (SEEA-E) as part of its regular work programme.

14. Since the previous UNCEEA meeting in June 2008, the following activities with relation to SEEA-E have been undertaken:

- a) Draft Chapters 3 and 4 on physical and monetary asset accounts have been revised, based on the comments received from the drafting group following the consultation on the first draft of Chapters 1-4 in May 2008 and the decisions taken at the 13th London group meeting in Brussels 2008. Revisions have focused especially on the final decision on defining and recording depletion (see below).
- b) Chapters 5 and 6 on physical and monetary flow accounts have been drafted by the UNSD and will be sent out to the drafting group for comments in August 2009.
- c) A draft list of issues that will be covered in the drafting of IRES and that are relevant for the SEEA-E was presented at the Oslo Group meeting in February.
- d) Issue papers on some of the issues for the SEEA-Energy were prepared and discussed at the 14<sup>th</sup> London Group Meeting (Canberra, April 2009).

#### ***Progress on the list of issues***

15. The summary of progress made on resolving items from the list of issues for the SEEA-E is discussed below. The list of issues is included in Annex II.

#### ***SEEA-E issue 1: Classification of energy resources***

A suggestion for a classification of energy resources by type and resource characteristics was discussed at the 13th and 14th London Group Meetings in September/October 2008 and April 2009<sup>3</sup>. This suggested SEEA and SEEA-E classification of energy resources by characteristics is based on the abbreviated version of the United Nations Framework Classification for Fossil Energy and Mineral Resources (UNFC). The presentation of the classification by resource characteristics has been simplified and based on a two-dimensional representation. The London Group has agreed on the principles of the classification. However, a final update of the classification after the final deliberations of UNFC may be needed. The hierarchy of the classification by type also needs further consideration to ensure consistency with mineral and energy product classifications as presented by IRES. It

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<sup>3</sup> See: Ole Gravgård Pedersen, Statistics Denmark: *Suggestion for SEEA classifications of energy resources*. London Group Meeting on Environmental and Economic Accounting 29 September – 3 October 2008 EUROSTAT, Brussels, Belgium and

Ole Gravgård Pedersen: *SEEA classifications of energy resources*, 14<sup>th</sup> Meeting of the London Group on Environmental Accounting Canberra, 27 – 30 April 2009

is expected that these considerations will only require minor changes, and the work on this issue can probably be closed at the London Group meeting in November 2009.

#### *SEEA-E issue 2: Valuation of energy resources*

It has been agreed that energy resources will be valued using the net present value method. Methods for determining the discount rate, the rate of return to capital, the treatment of joint production, and other inputs needed for such valuations have been set out in the SEEA-E Chapter 4, which discusses monetary asset accounts. The comments received regarding these issues from the drafting group have been taken into account in the revised version of chapter 4. While there are still some matters that require further investigation and discussion, the main part of this issue has been resolved. The remaining issues are expected to be resolved during the second round of drafting group consultations on Chapter 4.

#### *SEEA-E issue 3: Renewable energy resource stocks*

This issue was discussed at the 14th London Group meeting in Canberra, based on a paper from the CBS, Netherlands<sup>4</sup>. For hydropower the natural resource (water reservoirs) is already clearly identified as a different type of asset from fixed assets such as dams. It follows that water reservoirs that are specifically used for hydropower generation should be classified as renewable energy assets. In the case of wind, solar and other renewable sources, there was no agreement on the recording in the revised SEEA. It was recommended that a follow-up paper be prepared for the next London Group meeting. The paper will explore the possibility of identifying the return to the renewable energy resource as part of the rent on land.

#### *SEEA-E issue 4: Decommissioning costs and recording of the ownership of mineral-related assets*

The treatment of decommissioning costs is described in SNA-2008. The draft SEEA-E chapters include references to SNA-2008 on this point and the SEEA-E text reflects the SNA-2008 treatment.

#### *SEEA-E issue 8: Losses*

Two papers on the issue of losses were discussed at the 14th London Group Meeting in Canberra<sup>5</sup>. The Group agreed with the typology of losses presented, though it recommended including extraordinary losses. The Group reached agreement on the treatment of losses, and expressed a preference for net reporting, and for making available extra information providing the bridge between gross/net bases in supplementary tables. An outcome paper on the concept and presentation of losses is

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<sup>4</sup> Maarten van Rossum, Mark de Haan and Sjoerd Schenau. Renewable energy resources in the SEEA, 14th Meeting of the London Group on Environmental Accounting, Canberra, 27 – 30 April 2009

<sup>5</sup> Alessandra Alfieri and Ole Gravgård: Recording losses in the SEEA and Ole Gravgård: Recording of losses in the physical supply and use tables. 14th Meeting of the London Group on Environmental Accounting, Canberra, 27 – 30 April 2009

to be circulated to the Group for consultation and approval by UNSD and Statistics Denmark.

*SEEA-E issue 10: Double-counting*

The draft SEEA-E chapters on physical and monetary flow accounts include a proposal for recording energy supply and use in alternative ways. This proposal would both highlight and avoid the double-counting of energy flows. The proposed tables were presented to the London Group at the 13th meeting in Brussels 2008. A revised version of the tables will be drafted following the comments from the drafting group after the chapters have been posted on the SEEA-E website in August 2009.

*SEEA-E issue 11: Emission permits*

At the 14th London Group meeting in Canberra 2009, a paper<sup>6</sup> setting out the background to the treatment of emission permits, including a discussion of a range of available treatment options, was presented and discussed. In general, there was agreement in the London Group that SEEA should follow the SNA in order to avoid confusion among users. It was agreed to continue the work, and to draft tables that record both the monetary transactions involved in issuing permits and the physical flows of CO<sub>2</sub> permits. It was also agreed that there is a need to explain in more detail the relation between the SNA and the SEEA accounting, especially with respect to the fact that the atmosphere is acknowledged as an asset in SEEA, but not in the SNA 2008. It is expected that the London Group at its meeting in November 2009 will be able to close the discussion of the overall treatment of the permits, and that at the same time more exact rules for the recording of permits in the SNA will have been developed by the OECD/Eurostat taskforce on the treatment of emission permits.

*SEEA-E issue 12: Recording of natural resource depletion for a non-renewable resource*

At the 13th meeting of the London Group in Brussels 2008 a number of issues related to the application of the definition of depletion agreed on previously by the London Group were discussed again. Issues involving the split of the resource rent into an income element and a depletion element were raised. For example, depletion, according to the agreed-upon definition, is determined by factors that are unrelated to current extraction; it may be negative; and the income element of the resource rent may seem disproportionate compared to the resource stock values when ownership is split. However, in spite of these counter-intuitive properties, the London Group agreed to keep the already agreed-upon definition of depletion because it has other convenient properties in relation to the accounting. Further work on interpreting negative values of depletion and recording the income element of resource rents in the case of split ownership remains to be done.

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<sup>6</sup> Sylvie Le Laidier and Thomas Olsen: Treatment of Emission Permits - Implications for the SEEA. 14th Meeting of the London Group on Environmental Accounting Canberra, 27 – 30 April 2009



## ***IRES and SEEA-E***

16. The SEEA-E will rely on concepts definitions and classifications of basic energy statistics which are being discussed in the context of the drafting of IRES by the Oslo Group on Energy Statistics and the InterSecretariat Working Group on Energy Statistics. To ensure consistency to the extent possible between SEEA-E and IRES, it is important that the timeline for solving some of the issues is aligned with that of the SEEA and the SEEA-E. This would imply that the issues would need to be solved by the end of 2009.

17. The issues that have been identified when drafting the SEEA-E that are either being addressed as part of IRES or that require attention to ensure consistency between the two publications are the following:

### *1. Classification of energy products and related issues*

a. The SEEA-E will use the classification of energy products developed for IRES at an aggregated level. This would imply that a classification of energy products including the correspondence table with CPC and HS should be developed.

b. The SEEA-E will further elaborate on the link between the classification of energy products and the classification of energy assets, which at present are not within the scope of IRES.

c. The definition energy products needs to be clarified. For instance, it is unclear whether to classify waste and food (biomass) to the extent that they are used as inputs to the production of electricity and heat as energy products or only as part of the classification by purpose.

d. The conversion factors between mass units and energy units need to be clarified. Furthermore, the original unit in which specific products are disseminated should be specified.

### *2. Classification by purpose*

It was recommended that the SEEA-E include a classification by purpose. It is unclear if IRES will cover such classification. If it does, the SEEA-E should use the IRES classification.

### *3. Classification of energy industry/sector*

The SEEA-E will use as much as possible the definition of energy industry/sector used in IRES. A correspondence between the activities that are part of the energy industry/sector and ISIC will have to be developed.

### *4. Losses and theft of energy*

Losses and theft are treated in different ways in IRES and SEEA-E: the energy balances apply a gross output concept for secondary production, while SEEA-E use a net output concept for both primary and secondary production to maintain



consistency with the monetary flows. These differences must be clarified and methods must be developed to bridge the energy statistics and balances with the energy accounts.

#### *5. Monetary information*

It is unclear whether IRES will contain monetary data items. The SEEA-E includes both physical and monetary flows. It is important that monetary and physical flows are consistent. The monetary data items in IRES, if they are included, should clearly specify if they are consistent with the monetary flows of the SEEA-E.

#### *6. Definitions of exports and imports*

The definitions of imports and exports of IRES and SEEA-E should be checked for consistency with foreign trade statistics and national accounts. In particular, the recording of products sent abroad for processing should be clarified.

#### *7. Terminology*

Terms and definitions of relevant flows used in the energy statistics and energy balances should be compared with corresponding terms and definitions in SEEA-E. Consistency should be the aim, but if it is not possible to achieve it, then the differences and the reason for the differences should be explained.

### **SEEA-E and emission accounts**

18. The outline of the SEEA-E includes as Chapter 7 a description of energy-related air emission accounts. At the third meeting of the United Nations Committee of Experts on Environmental-Economic Accounting in June 2008 some members questioned the usefulness of having a chapter on energy-related emissions, as these comprise only a part of the total emissions as reported in emission inventories. While it is clear that air emissions accounts are closely linked to the energy accounts of SEEA-E, it is also clear that complete air emission accounts include more than the energy-related emissions, and that the full potential of air emissions can only be reached if the air emissions accounts also include non-energy related emissions. It was therefore agreed to reconsider at a later stage whether to include the description of air emission accounts in the SEEA-E.

19. UNSD is therefore considering the possibility of drafting a separate publication on *SEEA-Air Emissions*, which would present a complete set of accounts for air emissions including both energy-related and non-energy-related air emissions. Eurostat has recently drafted a *Manual for Air Emission Accounts*. This manual could, together with the SEEA-E accounts for energy, form the basis for the *SEEA-Air Emissions*. The energy-related air emission accounts would be presented as part of the applications.

#### **D. Towards the finalization of the SEEA-E**

20. The UNSD will continue the drafting of the remaining chapters of SEEA-E as part of its regular work programme. UNSD has recruited Mr. Ole Gravgård as a consultant to continue drafting the SEEA-E.

21. Draft chapters will be submitted for comments to the drafting group as they become available. Issue papers addressing the remaining issues will be prepared for discussion at the 15<sup>th</sup> London Group meeting in November 2009.

22. In preparing the SEEA-E, UNSD will continue to work in close cooperation with the London Group on Environmental Accounting and the Oslo Group on Energy Statistics. It is expected that the energy statistics issues that are relevant for the SEEA-E will be resolved by the beginning of 2009, to ensure consistency between SEEA-E and IRES.

23. An Expert Group Meeting on energy accounts and statistics is expected to be organized to discuss the complete draft of the SEEA-E at the end of 2009.

24. World-wide consultation will take place on the new draft of the SEEA-E after revision based on the comments from the Expert Group Meeting. The consultation will involve national statistical offices and regional and international organizations, to ensure universal relevance, applicability and feasibility of implementation for the SEEA-E.

25. The SEEA-E will be submitted to the UNCEEA for its recommendation to the United Nations Statistical Commission (UNSC) for adoption.

26. Table 1 below presents the revised timetable for the preparation of the SEEA-E.

#### **E. Questions to the UNCEEA**

- 1) *The UNCEEA may wish to express its views on the list of issues and timeline that impact both IRES and the SEEA-E?*
- 2) *Does the UNCEEA agree with the proposal to draft a separate publication on air emission accounts covering energy-related emissions as well all other air emissions?*
- 3) *The UNCEEA may wish to express its views on the process for the finalization of the SEEA-E?*

**Table 1. Timetable for the preparation of the SEEA-E**

	2009		2010				2010
	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Inputs to the drafting	Issue papers discussed at the 14 <sup>th</sup> London Group (Canberra, April)	Issue papers discussed at the 15 <sup>th</sup> London Group (Wiesbaden, November)					
Drafting	Consultant hired by UNSD to continue drafting SEEA-E Chapter 7	Chapters 8+9	Revise chapters on the basis of the comments from the EGM.				
Consultation	Outcome papers on energy-related issues  Revised Chapters 3+4 and new Chapters 5+6 to review group	Issues and outcomes papers presented to the 15th London Group meeting  Chapters 7+8 to review group	Report on progress of work to the UNSC by the UNCEEA  New chapter 9 and revised 1-8 to review group	World-wide global consultation to review the revised SEEA-E  UNCEEA reviews progress of work and process (NY, 26-27 June)			
		Expert Group Meeting on energy accounts and statistics reviews SEEA-E					
Final draft SEEA-E					Final draft SEEA-E	Approval of the UNCEEA of the SEEA-E and recommendation to the UNSC	SC adoption

## Annex I

### Annotated outline

*Chapter 1: Introduction.* This chapter will introduce the objectives of the SEEA-E, describe the target audience, present the relevance of energy accounts for policy-making including climate change and sustainable development policies, and describe the structure of the publication.

*Chapter 2: SEEA-E framework.* This Chapter introduces the SEEA-E accounting framework and explains the fundamental principles and features of the system. It describes how the generic asset accounts and supply-use tables are used as building blocks for SEEA-E. It describes the classifications used in the SEEA-E which form the backbone of the accounting framework and the interconnections between the different accounts. The Chapter also discusses the link with the energy balances and in particular the residence versus the territory principle.

*Chapter 3: Physical asset accounts for energy resources.* This chapter describes the definitions and classification of energy resources. It presents the links with the United Nations Framework Classification for Fossil Energy and Mineral Resources and the classification of assets of the SNA 2008. It (a) introduces the basic structure of an asset account; (b) explains and define the asset accounts entries (e.g. stocks of energy resources, discoveries and extraction); and (c) provides recommendations on measurement units and conversion factors in order to aggregate across different energy resources. The Chapter also presents asset accounts for inventories of energy products. It presents the SEEA-E standard tables for the physical asset accounts and tables populated with a numerical data set.

*Chapter 4: Monetary asset accounts.* This chapter introduces the principle of valuation of assets. It presents the net present value method as the recommended valuation method for valuing those resources that are economic in the SNA sense, in line with the SNA2008. It further provides methodological guidance on how to compile the monetary asset accounts for the stocks and changes in stocks in current prices as well as in constant prices. It also recommends to do a sensitivity analysis for the NPV obtained using different discount rates and rates of return to capital.

The chapter also presents standard tables for monetary asset accounts for inventories of energy products as well as asset accounts for produced assets relevant for energy analysis such as equipment, buildings and exploration and evaluation.

*Chapter 5: Physical flow accounts for energy.* This chapter presents the physical flow accounts for energy. It will introduce classification of products by purpose, namely classification of energy products used for energy or non-energy purposes and the classifications of other products used for energy purposes (e.g. bio fuels). It will describe the standard supply and use tables for energy products populated with the data from the fictitious data set. It will also discuss the different measurement units that can be used to

compile the tables. The chapter describes also the link between the standard tables and basic energy statistics and energy balances.

*Chapter 6: Monetary flow accounts.* This chapter describes supply and use tables of energy products in monetary terms, identifies the costs associated with the production and use of these products, the income generated by them, the cost of the infrastructure to explore and evaluate resources, to extract them and distribute them as well as the cost of maintaining them. The monetary supply and use tables can be compiled in both current and constant prices.

The chapter also describes energy-related transactions which are already in the SNA but are often not explicitly identified. These include for example (a) economic instruments such as taxes, subsidies, licenses and permits to bestow property rights over energy resources to designated users; (b) financing of energy and energy-related products (including infrastructure) through transfers; (c) emission permits. The chapter provides standard tables for the compilation of monetary accounts for energy and energy-related products, their financing, taxes subsidies, licenses and permits.

*Chapter 7: Energy-related air emission accounts.* This chapter describes energy-related air emission accounts. Emission inventories, which are usually compiled by countries to report to the United Nations Framework Convention on Climate Change (UNFCCC) are also discussed together with their link to accounts.

*Chapter 8: Hybrid accounts and sequence of accounts.* This chapter brings together the tables presented in the previous chapters. It presents the hybrid accounts which link the physical flow accounts to the monetary accounts. This is a very useful analytical tool for analyzing the interaction between the economy and the environment and provides the basis for more in-depth analysis, including input-output modeling.

The chapter also presents the sequence of accounts and shows the derivation of depletion-adjusted aggregates (e.g. environmentally-adjusted value added and genuine savings).

*Chapter 9 Application of energy accounts.* This chapter provides examples of applications of energy and energy-related air emission accounts derived from the techniques and tables presented in the previous chapters. These include, for example, the derivation of indicators to monitor and evaluate policies, decomposition analyses of economic growth and energy use and emissions; and scenario modeling including input-output analysis to estimate for example the impact of changes in energy prices or costs of emission permits on the economy;

*Annex 1. Standard tables.* This annex will present the standard tables which are presented in the various chapters. The standard tables constitute the minimum data set that all countries are encouraged to compile. An Excel file with templates for standard tables and populated with the fictitious data set will be available on the UNSD web-site.

*Annex 2. Classifications.* This annex will present the classifications that are relevant for the compilation of energy accounts: in particular the classification of energy assets, the classification of economic activities related to energy, classification of energy products and classifications relevant for the emission accounts.

*Annex 3. List of indicators.* This annex will present a list of indicators that can be derived from the SEEA-E. It will link the energy and air emission indicators most commonly used with the SEEA-E standard tables.

*Glossary.* An agreed-upon glossary of terms and definitions relevant for SEEA-E will be included.

## Annex II

### List of issues for the SEEA-E

The list of issues for the SEEA-E presented below has been developed on the basis of the issue list discussed at the First Meeting of the United Nations Committee of Expert on Environment-Economic Accounting (New York, 22-23 June 2006)<sup>7</sup>, the Special Session of the London Group on Energy Accounts (Rome, 17-19 December 2007)<sup>8</sup>, at the Third Meeting of the Oslo Group on Energy Statistics (Vienna, 4-6 February 2008)<sup>9</sup>.

#### *Issue 1. Classification of energy resources*

##### *Issue 1a. Classification of assets for energy resources*

An agreed classification of energy resources is fundamental for the development of standard tables on asset accounts for energy resources. The SEEA-2003 distinguishes, in its asset classification, mineral and energy resources into the following categories: EA.111 Fossil fuels; EA.112 Metallic minerals; and EA.113 Non-metallic minerals. The SEEA asset classifications has to be revisited and to make sure that the categories are mutually exclusive (e.g. coal is a fossil fuel and a non-metallic mineral) and extended to include also new forms of energy (e.g. nuclear energy and renewable energy).

##### *Issues 1b. Categorization of resources*

The SEEA-2003 provides a categorization of resources based on the geological and economic characteristics of the deposits, into proven, probable and possible. This categorization is based on the McKelvey box. More recently, the development of United Nations Framework Classification for Fossil Energy and Mineral Resources (UNFC) was endorsed by the United Nations Economic and Social Council (ECOSOC) which recommended its application worldwide. The UNFC, in addition to the geological and economic characteristics of the deposits, introduces a third dimension, which is linked to the project feasibility. As a result, there is a need for the SEEA-E to develop a categorization of resources based on the UNFC.

Aggregation over energy resources over different fields and with heterogeneous quality is an additional issue to be addressed.

#### *Issue 2. Valuation of energy resources*

In absence of market prices the net present value method has been identified as being the preferred valuation method for energy resources. Some general methodological recommendation on how best to implement the net present value still need to be developed. They include, for example a discussion on the rate of return to capital, the rationale behind the choice of the discount rate, the calculation of the resources rent in case of joint production (e.g. in the case of a combined silver and copper mine), the

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<sup>7</sup> <http://unstats.un.org/unsd/envaccounting/ceea/meetings/UNCEEA-1-10.pdf>

<sup>8</sup> <http://unstats.un.org/unsd/envaccounting/londongroup/meeting12.asp?sID=2>

<sup>9</sup> [http://www.ssb.no/english/conference/ocg/vienna/2c\\_paper.pdf](http://www.ssb.no/english/conference/ocg/vienna/2c_paper.pdf)

treatment of fluctuations in resource rents over relatively short periods of time, volatility and negative resource rents, the use of moving averages of resource rents, determining the extraction profiles and constant price valuations of stocks.

### ***Issue 3. Renewable energy resource stocks***

Renewable energy resources have become increasingly important. Some have argued that for renewable energy resources there may be a stock which would be the expected generation of renewable energy depending on the technology. Not including the stock of renewable resources in the stock may provide an unbalanced view of total stock of energy available in the country.

### ***Issue 4. Decommissioning costs and recording ownership of mineral-related assets<sup>1</sup>***

The SEEA-2003 suggested more than one option in recording decommissioning costs and recording of ownership of mineral-related assets. According to SNA 2008, decommissioning costs (terminal costs) lead to the creation of a fixed asset which has to be recorded as gross fixed capital formation in the asset accounts. Similarly, the asset account should in each period reflect a consumption of this fixed asset. The gross fixed capital formation are recorded at the end of the life time of the related asset, while the recording of the consumption of fixed capital takes place during the life time of the fixed asset. In order to estimate and record the consumption of fixed capital before the terminal costs actually has taken place it is necessary to estimate an expected terminal cost, which can be used as basis for the calculation of consumption of fixed capital.

The SEEA-E will have to be updated to reflect the changes in the SNA 2008.

### ***Issue 5. Classification/disaggregation of economic activities***

In the supply and use tables for energy, the relevant breakdown of industries for the standard and supplementary tables has to be identified and mapped to the International Standard Industrial Classification of All Economic Activities, Revision 4 (ISIC Rev. 4). The breakdown has to include the relevant economic activities on the supply side, such as, for example, economic activities for the extraction of energy resources, transformation/conversion of primary energy products and supply of energy products and the relevant activities on the use side.

The starting point should be the detailed industry breakdown used in energy statistics which distinguishes three groups of industries (which are called in energy statistics terminology “sectors”) and within each group a detailed list of industries is identified. The main groups are: the ‘transformations sector’ (broadly corresponding to activities dealing with the conversion of energy to other forms), “energy sector” (corresponding to energy producing activities) and “end-user sector” (industry, transport, residential, commercial/public services, agriculture/forestry, fishing and non specified).

### ***Issue 6. Classification/disaggregation and definition of energy products***

The list of energy products to be included in the supply and use tables has to be identified and mapped into international classifications of products such as the Central Product Classification (CPC ver. 2) and the Harmonized System Codes (HS).



The distinction between primary and secondary energy products is often made in energy statistics to distinguish energy products that are “either extracted or captured directly from natural resources such as crude oil, hard coal, natural gas – primary; or are produced from primary sources – secondary” (OECD/IEA/Eurostat 2005<sup>10</sup>). Some countries distinguish between primary and secondary products in their energy accounts. It is relevant to have this distinction in the standard tables for energy accounts.

#### ***Issue 7. Classification of energy use by purpose***

In energy statistics and balances a distinction is generally made in the use of energy products between “non-energy use”, “final energy use” and “transformation input”. Depending on how energy products are defined, there may be the need to cover in the supply and use table not only the supply and use of ‘energy products’ (as output of the ‘energy industry’), but also the supply and use of (the main) non-energy products which are used for energy purposes. In this regard it is particularly important to develop a classification of products by purpose (i.e. for energy and non-energy purposes) and to define the boundary of the non-energy products to consider. It should be said that the supply and use tables for non-energy products will include only the part of non-energy products used for energy purposes.

Non-energy use (of energy products) refers to the use of energy products as raw materials in the chemical, petrochemical and other industries, not for the purpose to produce energy (e.g. bitumen used for asphalt). Final energy use refers to the use of energy products for energy purposes. It excludes the use of energy product for transformation into other forms of energy. Transformation input refers to the conversion of primary forms of energy to secondary and further transformation (e.g. coking coal to coke, crude oil to petroleum products, and heavy fuel oil to electricity).

#### ***Issue 8. Energy losses (e.g. in distribution, storage, etc.)***

Losses of energy (in the storage, distribution system, transformation) are an important indicator of the efficiency of the distribution/storage/transformation system and allow for a mass balance of the energy flow. The question is should the physical supply and use table record explicitly these flows and how to record them. In the case of water, the supplementary physical supply and use tables explicitly identify the losses in distribution which are allocated to the supplier. The same should be done for energy. Different types of losses, including flaring should be analyzed in order to develop a proper recording for these flows in the supply and use tables.

#### ***Issue 9. Conversion factors***

At present there exist different conversion factors which are applied to convert energy products among different units. There is a need to obtain an international agreed set of conversion factors to ensure international comparability if different measurement units are used by different countries. In this regards, the work of the Oslo Group will be an important input to the work on the SEEA – E.

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<sup>10</sup> 2005, OECD/IEA/Eurostat *Energy Statistics Manual*.

***Issue 10. Double counting***

Detailed supply-use tables include all types of energy, i.e. primary energy products as coal and crude oil on one hand and transformed/converted types of energy like petrol and heating and electricity. This leads to a double counting when all uses of energy are added in the sense that the same energy is counted more than once. A standard way of recording energy supply and use should be developed (net , gross or both).

***Issue 11. Permits to access the resources and emission permits***

The treatment of permits leases and licenses to access natural resources and emission permits has changed in the SNA 2008 as opposed to the 1993 SNA and the SEEA-2003. The SEEA-E should analyse the recommendations of the SNA 2008 and decide whether to follow them or depart from them, in particular for what concerns the treatment of emission permits which are in the SNA 2008 treated as taxes and not as permits.

***Issue 12. Recording of natural resource depletion for a non-renewable resource***

A characteristic of the SEEA-2003 is the provision of multiple options including a number of aspects of natural resource depletion. A statistical standard requires that these options be replaced with unambiguous accounting recommendations. This include:

- i. identifying the income element;
- ii. recording of mineral exploration and mineral deposits;
- iii. recording of additions and subtractions from resource stocks;
- iv. recording of asset ownership;
- v. recording of depletion.

All these options need to be translated into unambiguous accounting recommendations. It is expected that these will together lead to clear cut recommendations on the compilation of depletion adjusted national accounts aggregates (product, income and saving).