

The System of Integrated Environmental and Economic Accounting for Energy (SEEA-E)



Environment and Energy
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Outline

- Brief introduction to SEEA-Energy and energy accounts
- The link between IRES and SEEA-Energy
- Possible applications of energy accounts
- Link between energy accounts and air emission accounts

- SEEA implementation strategy



What are energy accounts?

- Based on the principles laid down in SEEA-CF
 - System of Integrated Environmental Economic Accounting – Central Framework (European Commission, FAO, IMF, OECD, UN, World Bank)
 - Developed as a satellite system to the National Accounts
 - Adopted by the UN Statistical Commission as a standard
- A multipurpose, conceptual framework that describes the interactions between the economy and the environment, and the stocks and changes in stocks of environmental assets
- ...and SEEA-E
 - System of Integrated Environmental Economic Accounting for Energy (to be finalised shortly)
- The main focus will be on the flow accounts

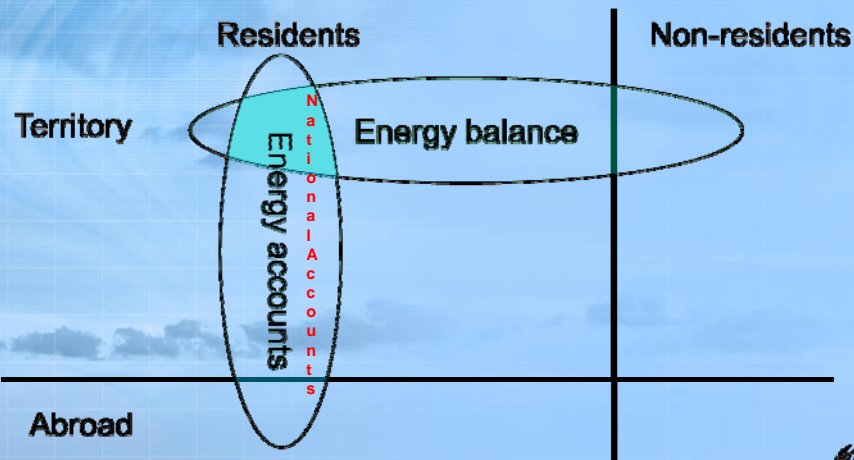


In other words...

- Information on energy organised within the System of National Accounts framework
 - Based on the same concepts, definitions and classifications as National Accounts
- Energy flow accounts is supply and use of energy within the national economy (not the territory)
- This way of describing the flow of energy is fully consistent with the way economic activities are described



Residence principle versus territory principle



SEEA-E contents

- Physical flow accounts - supply and use of energy in specific units or common units (Joules) (chap. 3)
- Monetary flow accounts – supply and use of energy in monetary units (chap. 4)
- Physical asset accounts for energy resources (chap. 5)
- Monetary asset accounts for energy resources (chap. 6)
- Applications (chap. 7)



Tables in SEEA-E - 1

- Conceptual tables illustrating the framework
 - Supply and use tables showing the flows of
 - Energy natural inputs
 - Energy products
 - Energy residuals
 - From the environment to the economy
 - Within the economy
 - From the economy to the environment
 - In physical and monetary units



Tables in SEEA-E - 2

- Conceptual tables illustrating the framework
 - Asset accounts for energy resources showing the
 - Opening stock
 - Closing stock
 - Changes in between
 - In physical and monetary units



A few words about SEEA-E

- SEEA-E builds on energy statistics and energy balances **as described in IRES**, but includes the monetary side and the resource stocks as assets as well
- It includes a large number of tables for many different aspects of energy
- Not all tables are relevant for all countries
- Countries need to decide which parts/tables are most relevant for them – taking available manpower resources into account

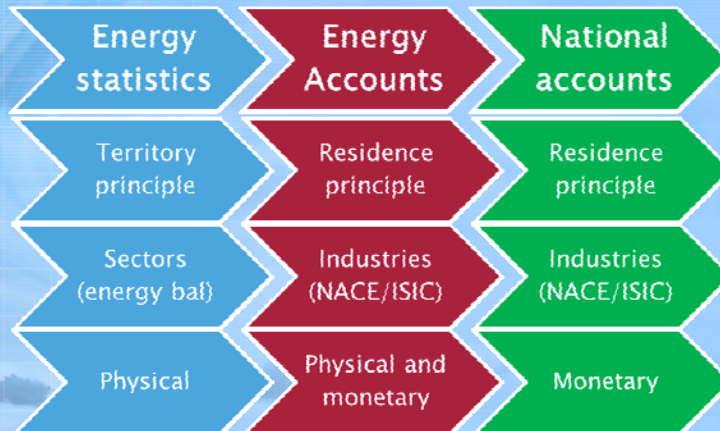


Links between energy statistics, energy balances and energy accounts

Energy Statistics	Energy Balances	Energy Accounts
Based on primary statistics (production, foreign trade, business survey)	Based on energy statistics	Based on energy statistics and balances
Specific energy surveys	Supply and use balances	Supply and use balances
No specific format	Various formats (IEA, Eurostat, UN)	Uses national accounts SUT format
	Sectors and industries (ISIC)	Industries classified by ISIC
	Rearrangement of industries' energy use according to purpose (transport, auto-producers and heat for sale)	No re-arrangement of industries' energy use
	Detailed description of energy sector including technologies	Energy "sector" described by ISIC No description of technologies
	All transport in one separate sector	Own account transportation included in industries' activities
Territory principle	Territory principle	Resident principle
	Statistical differences	No statistical differences
Physical	Physical	Physical and monetary



Links between energy statistics, energy accounts and national accounts



- Basically same information as energy balances, but rearranged and due to the adjustments fully consistent with the national accounts



Energy Flow Accounts in brief - 1

- Supply of energy
 - Extraction/production
 - Imports
- Use of energy
 - Intermediate consumption in industries
 - Final private household consumption
 - Changes in inventories
 - Exports
 - Cable losses etc.
- The supply equals the use



Energy Flow Accounts in brief - 2

- Production/extraction and the intermediate consumption are broken down by the national accounts industry classification (based on ISIC) used in the country
- Broken down by a relevant energy product classification used in the country (that can be linked to international energy product classifications)
- In either physical units
 - specific units (tonnes, m3, GWh)
 - common units (GJ)
- ... or in monetary units
 - Basic prices, trade margins, taxes, VAT, market prices



Purpose of energy accounts

- To give a coherent and thorough description of all economic transactions related to the flow of energy
 - In both physical quantities and in monetary values
 - Consistent with the energy statistics and balances
 - Consistent with other economic statistics
 - E.g. revenues from energy taxes as accounted for in the Government finance statistics
- Provide the basis for the analysis of the link between the economy as described in the national accounts and the flows of energy



Examples of energy accounts tables

- Energy flow accounts
 - www.statbank.dk/ene1n - specific units
 - www.statbank.dk/ene2n - common units
 - www.statbank.dk/ene4n - monetary values
- Energy asset accounts
 - www.statbank.dk/mreg26 - balance for oil reserves
 - www.statbank.dk/mreg27 - balance for natural gas reserves
 - www.statbank.dk/mreg29 - value of oil and natural gas reserves



Combining information from energy accounts with national accounts

2011	Actual use of energy	Energy taxes	Output	Gross value added	Employment
	Per cent				
Total Industries	100%	100%	100%	100%	100%
A Agriculture, forestry and fishing	3%	5%	3%	1%	3%
B Mining and quarrying	2%	0%	2%	4%	0%
C Manufacturing	8%	12%	18%	11%	11%
D_E Utility services	27%	3%	3%	2%	1%
F Construction	2%	8%	6%	5%	6%
G_J Trade and transport etc.	52%	32%	23%	19%	25%
J Information and communication	1%	2%	5%	4%	4%
K Financial and insurance	0%	2%	5%	7%	3%
LA Real estate activities and renting of non-residential buildings	0%	1%	2%	3%	1%
LB Dwellings	0%	0%	5%	8%	0%
M_N Other business services	1%	6%	8%	8%	10%
O_Q Public administration, education and health	3%	24%	17%	24%	31%
R_S Arts, entertainment and other services	1%	4%	3%	3%	5%



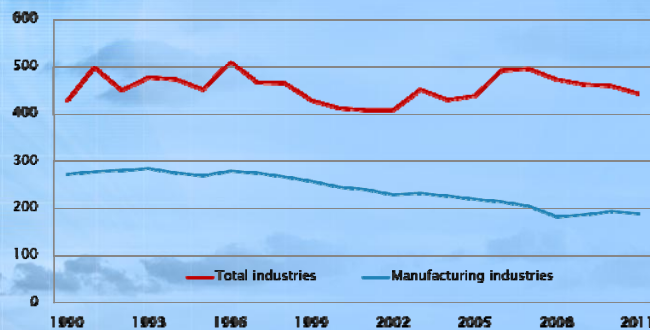
Analysis of the relationship between economic activities and the use of energy

- Energy intensities or energy productivity (economic efficiency)
 - Use of energy compared to output or economic growth
 - Decoupling of use of energy from the economic output
- Input-output model based analysis (multipliers)
 - What is the effect on the use of energy of increased economic activity?
- Decomposition analysis
 - Which factors have contributed to the development?



Energy intensities

- Use of energy compared to output (GJ / Mill. Dkk, 2005-prices, chained values)



Input-Output modelling results

- Direct and indirect use of energy in industries
- Use of energy broken down by causing final demand
 - Private consumption, government consumption, investments, exports
- Direct and indirect use of energy related to the households private consumption
- Use of energy embodied in imports



Macro-economic models

- The energy accounts can also provide input to macro-economic models describing the links between the economy, energy demand and energy related emissions
- The models are used for forecasting and scenario analysis
 - Effect of economic growth on the use of energy and in which industries
 - Effect on the economy, e.g. employment or economic growth from pursuing certain environmental goals by imposing an energy tax



Air emissions accounts - 1

- Conceptually described in SEEA Central Framework
- Emissions of CO₂, N₂O, CH₄, SO₂, NO_x, CO, NH₃, NMVOC etc
- Similar with energy accounts, the air emissions accounts show the same information as is already available in the emission inventories based on the IPCC guidelines reported to the UNFCCC, but with the similar adjustments they are fully consistent with the way economic activities are described in the national accounts, ie. emissions broken down by ISIC industries.



Air emissions accounts - 2

- The energy accounts provide a very important building block in the compilation of the air emission accounts
- The air emission accounts are compiled by multiplying the use of energy in the energy accounts with emission factors specific for the use of energy described in energy accounts



Non-energy related emissions

- A full set of air emission accounts include information on non-energy related emissions e.g. CH₄ emissions from livestock
- Those emissions from processes should also be allocated to ISIC industries



Applications of air emissions accounts

- Same applications as energy accounts
- Emission intensities
- IO-modelling results
- In combination with energy accounts and national accounts data the air emissions accounts provides a useful basis for the building of environmental extended macro-economic models



The SEEA Implementation Strategy - 1

- Background
- SEEA CF adopted by UNSC in 2012
 - SEEA implementation should be a **long-term program**, to be implemented **flexibly and incrementally**, giving full consideration to **national circumstances and requirements**
 - Requested UNCEEA to develop an implementation strategy
- Implementation strategy endorsed by 2013 UNSC
 - Practical actions that can be taken by international organizations and national statistical systems to maximise the extent to which SEEA is implemented in the short to medium-term
- Discussion of implications at International conference on SEEA implementation in New York 17-19 June 2013



The SEEA Implementation Strategy - 2

- The flexible and modular approach
- Countries differ in terms of their specific environmental-economic policy issues and their level of statistical development. Accordingly, countries may prioritize the accounts they want to implement over the short to medium-term based on the most pressing policy demands
- Should energy be one of the priorities then SEEA-Energy along with IRES and ESCM provide the guidance necessary for the compilation of the accounts
- Operationalized by a number of phases



The SEEA Implementation Strategy - 3

- Four phases
- First phase – establish national institutional arrangements
- Second phase – self assessment using diagnostic tool
- Third phase -- data quality assessment
- Fourth phase – preparation of strategic development plan
- These phases would be supported by international activities



The SEEA Implementation Strategy - 4

- Implementation activities
- Technical assistance and training
- SEEA implementation guide, compilation manuals, diagnostic tools, technical notes, data quality assessment framework and training materials
- Core sets of SEEA tables for data collection and reporting
- Creation of partnerships at global, regional and national level, including cooperation with the policy and scientific communities
- Advocacy and communication



The SEEA Implementation Strategy - 5

- Considerations for SEEA implementation
- Strategic approach to the implementation
 - National Strategies for the Development of Statistics (NSDS) should be linked to strategic planning frameworks such as the National Development Strategies, National Sustainable Development Strategies (NSDS) and National Biodiversity Strategies and Action Plans (NBSAP)
- Linking the implementation to policy demands
 - The SEEA can serve as the statistical infrastructure in response to existing policy frameworks such as Post 2015 Development Agenda, Natural Capital Accounting and Wealth Accounting and Valuation of Ecosystem Services (WAVES), green economy/green growth, sustainable production and consumption (SPC), etc



The SEEA Implementation Strategy - 6

- More considerations for the SEEA implementation
- Bottom-up approach
 - countries owning the implementation process and agreeing on national implementation strategies and implementation plans
- Sub-regional and regional approach
 - sub-regional organizations have played important roles in bringing together countries, compiling existing statistics, promoting standards and developing capacity in countries and fostering south-south cooperation
- Linked to the 2008 SNA implementation programme and the global strategy for agriculture and rural statistics
- Stages of implementation by 2020 based on national priorities



The SEEA Implementation Strategy - 7

- Contact point

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Thank you very much for your attention!

