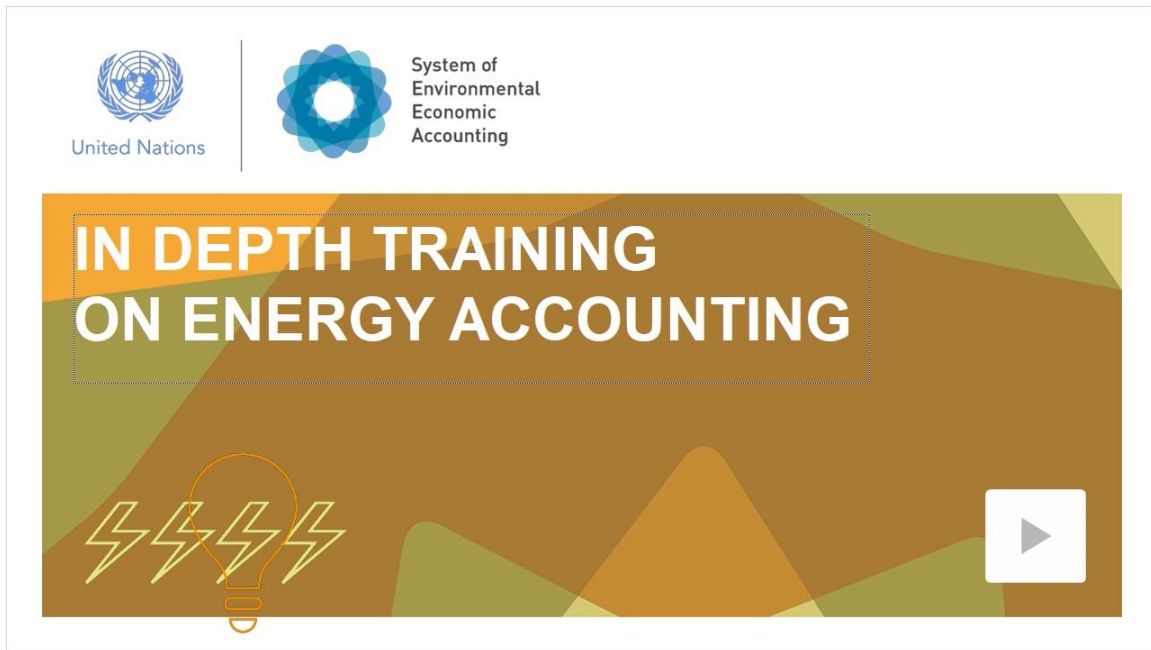


SEEA_Energy

1. Start

1.1 Title page



Notes:

1.2 Intro

INTRO


SEEA

Welcome to SEEA-Energy!

The following six modules introduce SEEA-Energy and related material for self-teaching purposes. They are designed to help you acquire an initial understanding of how the SEEA's integrated energy accounts can be compiled and then applied to policy decisions for sustainable development.

Further information can be found in the material provided on our website, seea.un.org. You can also join us in our regional meetings and workshops.

UNSD and partners very much appreciate your commitment. **Thanks for being here!**



1.3 Module overview

MODULE OVERVIEW

SEEA

Please select your chapter! Each chapter takes about 20 minutes to complete.

Module 1:
Introduction to the
SEEA CF and
SEEA-Energy

Module 2:
Definitions and
accounting structures

Module 3:
Physical supply and
use tables

Module 4:
Asset accounting

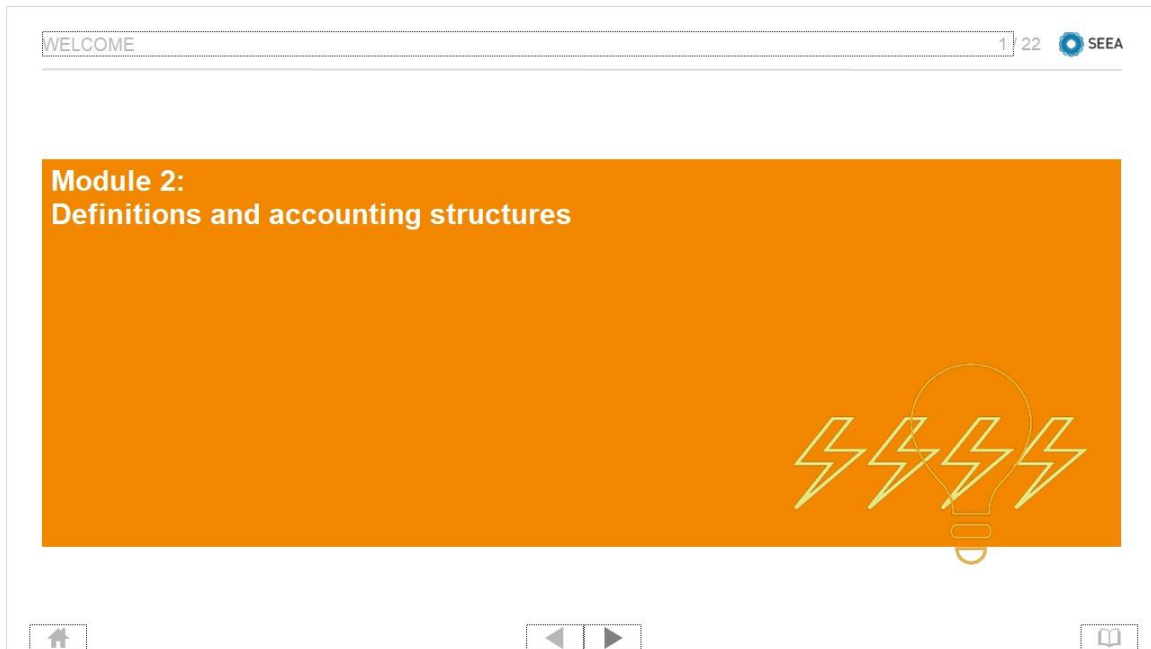
Module 5:
Basic statistics and
energy balances

Module 6:
Practical guidance

Notes:

2. Module 2 - Definitions and accounting structures

2.1 Welcome



Notes:

2.2 Welcome...

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

2 / 22 SEEA

Welcome


... to **Module 2: Definitions and accounting structures!**

This module focuses on important concepts and definitions used in the SEEA-Energy accounts. It also gives you a quick introduction to the main accounts and tables in SEEA-Energy. The topics covered are:

- The scope of SEEA-Energy
- Residence vs. territory principle
- Production, consumption and accumulation
- Types of physical flows related to energy
- Transformation of energy
- Classification of industries, products and use
- Physical and monetary units
- Energy assets
- Other energy-related stocks and flows
- Main types of SEEA-Energy accounts and tables

We appreciate your interest in accounting for energy.

Thanks for learning!



2.3 Concepts & Definitions

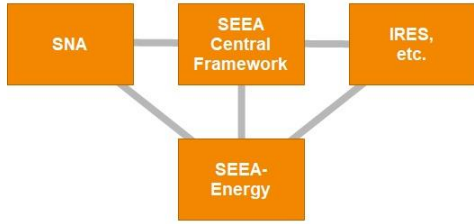
MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Concepts and definitions in the SEEA-Energy

The SEEA-Energy accounts – like any of the SEEA Central Framework accounts – are built around a set of common definitions and principles:

- For the most part, these definitions and principles come from the **System of National Accounts (SNA)**. Others are specific to energy.
- Definitions and concepts specific to energy are mainly drawn from **energy statistics** and the **International Recommendation of Energy Statistics (IRES)**.
- In this module we'll look at the important definitions and concepts first. After that you'll get a short overview of the different accounts that are part of SEEA-Energy.



2.4 Scope

(Drag and Drop, 10 points, 1 attempt permitted)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

4 / 22 SEEA

Scope of SEEA-Energy

Within the scope of the SEEA-Energy accounts are **energy flows and stocks relevant to the national economy and resident units**. These must be clearly defined to ensure **information is consistently measured** over time, across countries and between different areas of analysis. Can you sort out the definitions given below?

Drag the terms to their definitions!

Area under effective economic control of a single government

Entity that is capable of engaging in economic activities and in transactions with other entities. It may own assets and have liabilities

Institutional unit with a centre of economic interest in the economic territory of that country

Institutional unit with an centre of economic interest outside the econometric territory of the country





Resident

Institutional unit

Non-resident

Economic territory

OK



Drag Item	Drop Target
Institutional unit	Rectangle 8
Non-resident	Rectangle 10
Resident	Rectangle 9
Economic territory	Rectangle 4

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:

For energy accounts there are two important points for the question of residency:

Consistent with the SNA treatment, extraction of mineral and energy resources is always considered to be done by resident units.

Resident producing units may operate outside of the national territory.

Feedback when incorrect:


For energy accounts there are two important points for the question of residency:

Consistent with the SNA treatment, extraction of mineral and energy resources is always considered to be done by resident units.

Resident producing units may operate outside of the national territory.

Correct (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

4 / 22  SEEA

Scope of SEEA-Energy

Within the scope of the SEEA-Energy accounts are **energy flows and stocks relevant to the national economy and resident units**. These must be clearly defined to ensure **information is consistently measured** over time, across countries and between different areas of analysis. Can you sort out the definitions given below?

Drag the terms to their definitions!

Area under effective economic control of a single government

Entity that is capable of engaging in economic activities and in transactions with other entities. It may own assets and have liabilities

Institutional unit with a centre of economic interest in the economic territory of that country

Institutional unit with an centre of economic interest outside the econometerritory of the country

Very good!


For energy accounts there are two important points for the question of residency:

- Consistent with the SNA treatment, extraction of mineral and energy resources is **always considered to be done by resident units**.
- Resident producing units **may operate outside of the national territory**.

Continue

Incorrect (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Scope of SEEA-Energy

Within the scope of the SEEA-Energy accounts are **energy flows and stocks relevant to the national economy and resident units**. These must be clearly defined to ensure **information is consistently measured** over time, across countries and between different areas of analysis. Can you sort out the definitions given below?

Drag the terms to their definitions!

Economic territory
Area under effective economic control of a single government

Institutional unit
Entity that is capable of engaging in economic activities and in transactions with other entities. It may own assets and have liabilities

Resident
Institutional unit with a centre of economic interest in the economic territory of that country

Non-resident
Institutional unit with an centre of economic interest outside the econometerritory of the country

Not quite right. Take a look at the solution!

For energy accounts there are two important points for the question of residency:

- Consistent with the SNA treatment, extraction of mineral and energy resources is **always considered to be done by resident units**.
- Resident producing units **may operate outside of the national territory**.

Continue

2.5 Residence vs. territory

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Residence vs. territory principle

Geographic boundaries for SEEA-Energy are **different from** those commonly used for energy statistics and energy balances.

- SEEA-Energy uses the residence principle and includes energy products sold to residents, whether operating **within the national territory or abroad**. As a result, transactions related to international bunkering and transport are accounted for according to the residence of the operator of the transport equipment.
- Energy statistics and energy balances are usually **based on the territory principle**. This assigns flows to the country in which the producing or consuming unit is **located at the time of the flow**.
- The **rest of the world** is a term used to describe the world outside the national territory.

Explore the table to find out more!

	Residents	Non-residents	
National territory	Sold on territory to resident units	Sold on territory to non-residents (foreign, tourists, transport companies, embassies)	Energy statistics and balances
Rest of the World	Sold to residents operating abroad (tourists, transport companies, etc.)		
	SEEA-Energy		

2.6 Recording

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Recording of imports and exports

Imports and exports of energy products should be recorded **when a change of ownership** involving a resident and non-resident unit occurs:

- Energy products **sent abroad for processing** do not involve a change in ownership. Therefore – according to the SNA – no import or export of energy products is recorded in the monetary accounts (instead an import of processing services is recorded).
- For the physical flow accounts however, it is often appropriate to **record the actual physical flows**, i.e. to record an physical export and subsequent physical import of energy products when they are sent abroad for processing.



2.7 Productions, Consumption, Accumulation

(Drag and Drop, 10 points, 1 attempt permitted)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

7 / 22 SEEA

Production, consumption and accumulation of energy

The economy includes **production, consumption and accumulation** activities conducted within the economic territory.
Can you sort out these descriptions in the context of energy as given below?

Drag the terms to their descriptions!

The use of energy products for the satisfaction of individual or collective human needs or wants.

Economic activities that use labour, capital and products to produce outputs of other products.

Additions to physical stocks of energy products that can be used in the future.

Consumption

Production

Accumulation

OK

Drag Item	Drop Target
Accumulation	Ziel 3
Consumption	Ziel 1
Production	Ziel 2

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:

Energy is produced within the extraction industries, refinery industry and electricity and heating suppliers, etc.

Consumption activities include consumption by households (heating, cooking, transport) and so-called intermediate consumption by industries.

Energy products may be temporarily accumulated in inventories for use in a subsequent period. Similarly, some energy products accumulated during an earlier period may be taken from inventories to be used in the economy, or for export.

Feedback when incorrect:


Energy is produced within the extraction industries, refinery industry and electricity and heating suppliers, etc.

Consumption activities include consumption by households (heating, cooking, transport) and so-called intermediate consumption by industries.

Energy products may be temporarily accumulated in inventories for use in a subsequent period. Similarly, some energy products accumulated during an earlier period may be taken from inventories to be used in the economy, or for export.

Very good! (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

7 / 22  SEEA

Production, consumption and accumulation of energy

The economy includes **production, consumption and accumulation** activities conducted within the economic territory.
Can you sort out these descriptions in the context of energy as given below?

Drag the terms to their descriptions!

The use of energy products for the satisfaction of individual or collective human needs or wants.

Economic activities that use labour, capital and products to produce outputs of other products.

Additions to physical stocks of energy products that can be used in the future.


Very good!

- Energy is produced within the extraction industries, refinery industry and electricity and heating suppliers, etc.
- Consumption activities include consumption by households (heating, cooking, transport) and so-called intermediate consumption by industries.
- Energy products may be temporarily accumulated in inventories for use in a subsequent period. Similarly, some energy products accumulated during an earlier period may be taken from inventories to be used in the economy, or for export.

Continue

Not quite right. Take a look at the solution! (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

7 / 22  SEEA

Production, consumption and accumulation of energy

The economy includes **production, consumption and accumulation** activities conducted within the economic territory.
Can you sort out these descriptions in the context of energy as given below?

Drag the terms to their descriptions!

Consumption
The use of energy products for the satisfaction of individual or collective human needs or wants.

Production
Economic activities that use labour, capital and products to produce outputs of other products.

Accumulation
Additions to physical stocks of energy products that can be used in the future.

Not quite right. Take a look at the solution!

- Energy is produced within the extraction industries, refinery industry and electricity and heating suppliers, etc.
- Consumption activities include consumption by households (heating, cooking, transport) and so-called intermediate consumption by industries.
- Energy products may be temporarily accumulated in inventories for use in a subsequent period. Similarly, some energy products accumulated during an earlier period may be taken from inventories to be used in the economy, or for export.

Continue

2.8 Types of physical flows

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES 8 / 22 SEEA

Types of physical flows related to energy

The national economy interacts with the environment and the rest of the world.

Explore the diagram to find out more!

Natural inputs are energy resources i.e. energy as we find it in the environment, and which we may extract or capture. Coal in the ground is an example of a natural input.

Energy products such as fuels, electricity and heat are energy in the form in which it is bought and sold or stored in inventories. Products are always produced or generated by an economic unit belonging to the national economy or are imported.

Energy residuals refers to energy that is discarded, discharged or emitted by industries and households through processes of production, consumption or accumulation.

Navigation icons: Home, Previous, Next, Search.

2.9 Energy as natural input

(Drag and Drop, 10 points, 1 attempt permitted)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES 9 / 22 SEEA

Energy from natural inputs

Energy from natural inputs records flows of energy from the environment to the economy. As natural inputs, energy is classified in a way that distinguishes between conventional types of solid and liquid natural resources, renewable forms of energy, and energy inputs embedded in cultivated biomass. Can you sort out these examples?

Drag the examples to the headlines!

Conventional solid and liquid natural resources (for extraction)	Renewable forms of energy (for capture)	Energy embedded in cultivated biomass (for harvest)

Willows and poplars planted in growing cycles of 3-5 years
Grasses
Hemp, corn, sorghum, sugarcane, bamboo

Solar
Hydro
Wind
Wave and tidal
Geothermal

Oil
Natural gas
Coal and peat
Uranium and other nuclear fuels

Natural timber resources

OK

Navigation icons: Home, Previous, Next, Search.

Drag Item	Drop Target
Oil	Target 1
Natural gas	
Coal and peat	
Uranium and other nuclear fuels	
Natural timber resources	Target 1
Willows and poplars planted in growing cycles of 3-5 years	Target 3
Grasses	
Hemp, corn, sorghum, sugarcane, bamboo	
Solar	Target 2
Hydro	
Wind	
Wave and tidal	
Geothermal	

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Tile)
Delay item drop states until interaction is submitted

Feedback when correct:

Inputs of energy from renewable sources are classified by source, and estimates of inputs will generally reflect the amount of energy actually produced.

Natural timber is considered a conventional resource for extraction, and to be differentiated from short-lived energy embedded in cultivated biomass for harvest.

Note that incineration of solid waste to produce energy is recorded in the accounts as being supplied from within the economy.

Feedback when incorrect:


Inputs of renewable forms of energy are classified by source, and estimates of inputs will generally reflect the amount of energy actually produced.

Natural timber is considered a conventional resource for extraction, and to be differentiated from short-lived energy embedded in cultivated biomass for harvest.

Note that incineration of solid waste to produce energy is recorded in the accounts as being supplied from within the economy.

Correct (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

9 / 22  SEEA

Energy from natural inputs

Energy from natural inputs records flows of energy from the environment to the economy. As natural inputs, energy is classified in a way that distinguishes between **conventional types of solid and liquid natural resources**, **renewable forms of energy**, and sort out these examples?

Drag the examples to the headlines!

Conventional solid and liquid natural resources (for extraction)	Renewable forms of energy (for capture)	Energy embedded in cultivated biomass (for harvest)

Very good!


- Inputs of energy from renewable sources are classified by source, and estimates of inputs will generally reflect the amount of energy actually produced.
- Natural timber is considered a **conventional resource for extraction**, and to be differentiated from short-lived **energy embedded in cultivated biomass for harvest**.

Note that **incineration of solid waste** to produce energy is recorded in the accounts as being supplied from within the economy.

Continue

Incorrect (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

9 / 22  SEEA

Energy from natural inputs

Energy from natural inputs records flows of energy from the environment to the economy. As natural inputs, energy is classified in a way that distinguishes between **conventional types of solid and liquid natural resources**, **renewable forms of energy**, and sort out these examples?

Drag the examples to the headlines!

Conventional solid and liquid natural resources (for extraction)	Renewable forms of energy (for capture)	Energy embedded in cultivated biomass (for harvest)
Oil Natural gas Coal and peat Uranium and other nuclear fuels Natural timber resources	Solar Hydro Wind Wave and tidal Geothermal	Willows and poplars planted in growing cycles of 3-5years Grasses Hemp, corn, sorghum, sugarcane, bamboo

Not quite right. Take a look at the solution!


- Inputs of renewable forms of energy are classified by source, and estimates of inputs will generally reflect the amount of energy actually produced.
- Natural timber is considered a **conventional resource for extraction**, and to be differentiated from short-lived **energy embedded in cultivated biomass for harvest**.

Note that **incineration of solid waste** to produce energy is recorded in the accounts as being supplied from within the economy.

Continue

2.10 Energy as energy products

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Energy products

When entering the economy, the inputs become energy products used directly for fuels; converted into other energy products; or exported to the rest of the world:

- In national accounts, energy as product is often classified according to the **Central Product Classification (CPC)** or some national version of it.
- For energy accounts, the recommended classification is the **Standard International Energy Product Classification (SIEC)** as used in IRES. Please note that there is no one-to-one relationship between the CPC and SIEC.
- In some cases, energy products may be used to produce non-energy products, such as plastics or lubricants.

SIEC Classification at top level (classes of energy)


- 0 Coal
- 1 Peat and peat products
- 2 Oil shale / oil sand
- 3 Natural gas
- 4 Oil
- 5 Biofuels
- 6 Waste
- 7 Electricity
- 8 Heat
- 9 Nuclear fuels and other fuels n.e.c.



2.11 Energy as residuals

(Multiple Response, 10 points, 1 attempt permitted)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Energy residuals

Energy residuals is the term used to describe **energy that is discarded, discharged or emitted by industries and households through processes of production, consumption or accumulation**. Energy residuals in physical terms comprise a number of components. Can you imagine which group of residuals the SEEA-Energy focusses on?

Check all the answers you think are correct!

- ☒ Energy losses during extraction, storage, transformation and distribution.
- ☐ Energy embodied in energy products used for non-energy purposes.
- ☐ Residual flow resulting from the generation of energy from the incineration of solid waste.

OK



Correct	Choice
X	Energy losses during extraction, storage, transformation and distribution.
	Energy embodied in energy products used for non-energy purposes.
	Residual flow resulting from the generation of energy from the incineration of solid waste.


Feedback when correct:

The economy's generation of residuals must be matched by either the collection of these residuals by other economic units or the release of these residuals to the environment.

Feedback when incorrect:

The economy's generation of residuals must be matched by either the collection of these residuals by other economic units or the release of these residuals to the environment.

Very good! (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES
11 / 22


Energy residuals

Energy residuals is the term used to describe **energy that is discarded, discharged or emitted by industries and households through processes of production, consumption or accumulation**. Energy residuals in physical terms comprise a number of components. Can you imagine which group of residuals the SEEA-Energy focusses on?

Check all the answers you think are correct!

- ☒ Energy losses during extraction, storage, transformation and distribution.
- ☐ Energy embodied in energy products used for non-energy purposes.
- ☐ Residual flow resulting from the generation of energy from the incineration of solid waste.


Very good!

The economy's generation of residuals must be matched by either the **collection of these residuals** by other economic units or **the release of these residuals** to the environment.

Continue

Not quite right. Take a look at the solution! (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

11 / 22  SEEA

Energy residuals

Energy residuals is the term used to describe **energy that is discarded, discharged or emitted by industries and households through processes of production, consumption or accumulation**. Energy residuals in physical terms comprise a number of components. Can you imagine which group of residuals the SEEA-Energy focusses on?

Check all the answers you think are correct!

- ☒ Energy losses during extraction, storage, transformation and distribution.
- ☐ Energy embodied in energy products used for non-energy purposes.
- ☐ Residual flow resulting from the generation of energy from the incineration of solid waste.

Not quite right. Take a look at the solution!


The economy's generation of residuals must be matched by either the **collection of these residuals** by other economic units or the **release of these residuals** to the environment.

Continue

2.12 Transformation of energy

(Drag and Drop, 10 points, 1 attempt permitted)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

12 / 22  SEEA

Energy in its various forms

Records of energy flows in physical terms must follow the principle of conservation of energy. This principle states that **energy cannot be created or destroyed**; it can only be **transformed from one form to another**. Can you sort out the examples below?

Drag the types of energy into the correct order!

Oil products used by the end user (e.g. motor gasoline to drive a vehicle)

Oil transformed into oil products (e.g. motor gasoline)





Oil extracted from the ground

Energy from natural inputs that flows from the environment to the economy

Heat generated is recorded as energy residual

Energy content recorded as energy products, losses as energy residuals

OK



Drag Item	Drop Target
Heat generated is recorded as energy residual	Target 1
Energy from natural inputs that flows from the environment to the economy	Target 3
Energy content recorded as energy products, losses as energy residuals	Target 2

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:

The total energy content of the energy products and the various losses have to be equal to the energy content of the oil extracted from the ground.


Feedback when incorrect:

The total energy content of the energy products and the various losses have to be equal to the energy content of the oil extracted from the ground.

.

Correct (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

12 / 22  SEEA

Energy in its various forms

Records of energy flows in physical terms must follow the principle of conservation of energy. This principle states that **energy cannot be created or destroyed**; it can only be **transformed from one form to another**. Can you sort out the examples below?

Drag the types of energy into the correct order!

Oil products used by the end user (e.g. motor gasoline to drive a vehicle)

Oil transformed into oil products (e.g. motor gasoline)

Oil extracted from the ground


Very good!

The total energy content of the energy products and the various losses **have to be equal** to the energy content of the oil extracted from the ground.

Continue

Incorrect (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

12 / 22  SEEA

Energy in its various forms

Records of energy flows in physical terms must follow the principle of conservation of energy. This principle states that **energy cannot be created or destroyed**; it can only be **transformed from one form to another**. Can you sort out the examples below?

Drag the types of energy into the correct order!

Heat generated recorded as energy residual

Energy content recorded as energy products, losses as energy residuals

Energy from natural inputs that flows from the environment to the economy

Oil products used by the end user (e.g. motor gasoline to drive a vehicle)

Oil transformed into oil products (e.g. motor gasoline)

Oil extracted from the ground

Not quite right. Take a look at the solution!

The total energy content of the energy products and the various losses **have to be equal** to the energy content of the oil extracted from the ground.

Continue

2.13 Physical flows of energy

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES 13 / 22 SEEA

Physical flows of energy

Energy enters the economy as a natural resource. Imports of energy products enter the economy and the flow from the economy to the environment is measured by calorific values.

Explore the diagram inputs to find out more.

- Flows within the economy include flows between the national economy and the rest of the world.
- Once energy enters the economy, it becomes a **physical flow**.
- Energy residuals** include energy losses that occur during **extraction** (e.g. flaring of natural gas), **distribution** (e.g. from the distribution network into the end use), **storage** (e.g. leakages), **transformation** (e.g. when coal is used to generate electricity) and **distribution** (e.g. electricity lost in transmission lines).
- The reporting of **heat generated when end users use energy products** is required in order to fully account for the flows of energy back to the environment.
- Air emissions, ashes and desulphurising products linked to energy are **not included in the energy accounts** when energy is measured and recorded by calorific values.

The diagram illustrates the physical flows of energy between three main entities: the Rest of the world, the National economy, and the National territory. The Rest of the world is shown in a light blue box at the top, containing 'Rest of the world economy (Economic activities by non-residents)' and 'Residents on rest of the world territory'. The National economy is in a green box in the middle, containing 'National economy (Economic activities by residents)' and 'Use of energy by industries and households'. The National territory is in a dark green box at the bottom, containing 'Natural resource inputs: energy from renewable sources; energy inputs into cultivated biomass' and 'Extraction and capture of energy'. Arrows indicate flows: blue arrows for flows within the economy, and green arrows for flows between the economy and the environment. A legend at the bottom right explains these arrow types.

2.14 Classification of industries

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES 14 / 22 SEEA

Classification of industries

To account for production or intermediate consumption of energy, it is often appropriate to **classify the economic units** involved according to industry:

- An industry consists of a group of establishments engaged in the **same, or similar, kinds of production activity**.
- For classification of industries the use of the **UN classification ISIC (International Standard Industry Classification)** is recommended.
- In cases when **national versions of ISIC** are used for national accounts, they should also be used for energy accounts.

The image shows the cover of the 'International Standard Industrial Classification of All Economic Activities (ISIC), Rev.4' published by the United Nations. The cover is blue with a yellow and white diamond pattern. A green box at the bottom right contains the text: 'Click here to find the ISIC classification on the UNSD website!'.

2.15 Classification of production and use

(Multiple Response, 10 points, 1 attempt permitted)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Classification of production and use

Which two classifications would you normally expect to use in the national accounts for describing the **production and use of energy by industries**?





Check all the answers you think are correct!

☐ Standard International Energy Product Classification (SIEC)

☒ Central Product Classification (CPC)

☒ International Standard Industrial Classification (ISIC)

OK



Correct	Choice
	Standard International Energy Product Classification (SIEC)
X	Central Product Classification (CPC)
X	International Standard Industrial Classification (ISIC)

Feedback when correct:

Normally national accounts do not use SIEC.

If the national accounts include supply and use tables, CPC, or a national version of it, is often used to classify products.

ISIC or a national version of it is used to classify economic activities/industries.

Feedback when incorrect:


Normally national accounts do not use SIEC.

If the national accounts include supply and use tables, CPC, or a national version of it, is often used to classify products.

ISIC or a national version of it is used to classify economic activities/industries.

Very good! (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

15 / 22 

Classification of production and use

Which two classifications would you normally expect to use in the national accounts for describing the **production and use of energy by industries**?

Check all the answers you think are correct!

- ☐ Standard International Energy Product Classification (SIEC)
- ☒ Central Product Classification (CPC)
- ☒ International Standard Industrial Classification (ISIC)

Very good!

Normally national accounts do not use SIEC.

- If the national accounts include supply and use tables, CPC, or a national version of it, is often used to classify products.
- ISIC or a national version of it is used to classify economic activities/industries.

[Continue](#)

Not quite right. Take a look at the solution! (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

15 / 22 SEEA

Classification of production and use

Which two classifications would you normally expect to use in the national accounts for describing the **production and use of energy by industries**?

Check all the answers you think are correct!

☐

Standard International Energy Product Classification (SIEC)

☒

Central Product Classification (CPC)

☒

International Standard Industrial Classification (ISIC)

Not quite right. Take a look at the solution!

Normally national accounts do not use SIEC.

- If the national accounts include supply and use tables, CPC, or a national version of it, is often used to classify products.
- ISIC or a national version of it is used to classify economic activities/industries.

Continue

2.16 Physical and monetary units

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Physical and monetary units

In SEEA-Energy - as in SEEA Central Framework - two types of units are used to form the accounts: **Physical units and monetary units**.

- SEEA-Energy uses **calorific values measured in joules**, as a common unit for the physical accounts
- In practice, one will often have to work with data in natural energy units (tonnes, m³, GWh) and may build the accounts around these units, **then finally convert into joules** using conversion factors.
- For monetary accounts, the national currency should be the unit for the accounts.





Examples of conversion factors for biofuels (Calorific values GJ per tonnes)

Solid biofuels
Fuelwood, wood residues and by-products 15.6
Black liquor 11.8
Charcoal 29.5

Liquid biofuels
Biogasoline 26.8
Biodiesels 36.8
Other liquid biofuels 27.4

Biogases
Landfill gas 50.4
Sewage sludge gas 50.4

See **IRES Chapter 4** for more information on physical units and conversion factors!



2.17 Energy assets

(Multiple Response, 10 points, 1 attempt permitted)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Environmental assets

Assets are **stores of value** which are owned and from which benefits can be derived over time. Environmental assets are the naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity. SEEA-Energy focuses on those environmental assets that are primarily used as energy sources.

Which of the statements below is true in the context of SEEA-Energy?

Check all the answers you think are correct!

☒

Mineral and energy resources such as coal, oil, natural gas and uranium ore are accounted for as environmental assets in SEEA-Energy to the extent that they can bring benefits to humanity.

☒

Timber is an environmental asset but not included in the asset accounts of SEEA-Energy as it is not primarily used for energy purposes.

☒

Short-lived biomass used for energy production is included as a natural input, but not included in the asset accounts of SEEA-Energy as it is not primarily used for energy purposes.

☒

Inputs of energy from renewable sources include solar and wind, but the sun and wind are not environmental assets for the purposes of SEEA-Energy.

OK

Correct	Choice
X	Mineral and energy resources such as coal, oil, natural gas and uranium ore are accounted for as environmental assets in SEEA-Energy to the extent that they can bring benefits to humanity.
X	Timber is an environmental asset but not included in the asset accounts of SEEA-Energy as it is not primarily used for energy purposes.
X	Short-lived biomass used for energy production is included as a natural input, but not included in the asset accounts of SEEA-Energy as it is not primarily used for energy purposes.
X	Inputs of energy from renewable sources include solar and wind, but the

sun and wind are not environmental assets for the purposes of SEEA-Energy.

Feedback when correct:

Assets provide inputs of capital into production processes and are a source of wealth for economic units, including households.

The use of assets as a source for natural inputs to the economy is linked to changes in the stock of assets that generate those inputs.


Feedback when incorrect:

Assets provide inputs of capital into production processes and are a source of wealth for economic units, including households.

The use of assets as a source for natural inputs to the economy is linked to changes in the stock of assets that generate those inputs

Very good! (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Check all the answers you think are correct!

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- ☒ Timber is an environmental asset but not included in the asset accounts of SEEA-Energy as it is not primarily used for energy purposes.
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- ☒ Inputs of energy from renewable sources include solar and wind, but the sun and wind are not environmental assets for the purposes of SEEA-Energy.

Very good!


Assets provide inputs of capital into production processes and are a source of wealth for economic units, including households.

The use of assets as a source for natural inputs to the economy is linked to changes in the stock of assets that generate those inputs.

Continue

Not quite right. All answers are correct! (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Environmental assets

Assets are **stores of value** which are owned and from which benefits can be derived over time. Environmental assets are the naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity. SEEA-Energy focuses on those environmental assets that are primarily used as energy sources.

Which of the statements below is true in the context of SEEA-Energy?

Check all the answers you think are correct!

- ☒ Mineral and energy resources such as coal, oil, natural gas and uranium ore are accounted for as environmental assets in SEEA-Energy to the extent that they can bring benefits.
- ☒ Timber is an environmental asset but not included in the asset accounts of SEEA-Energy as it is not primarily used for energy purposes.
- ☒ Short-lived biomass used for energy production is included as a natural input, but not in the asset accounts of SEEA-Energy as it is not primarily used for energy purposes.
- ☒ Inputs of energy from renewable sources include solar and wind, but the sun and wind are not environmental assets for the purposes of SEEA-Energy.

Not quite right. All answers are correct!

Assets provide inputs of capital into production processes and are a source of wealth for economic units, including households.

The use of assets as a source for natural inputs to the economy is linked to changes in the stock of assets that generate those inputs

Continue

2.18 Other energy-related stocks and flows

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Other energy-related stocks and flows

The core accounts of the SEEA-Energy cover energy-related flows between the environment and the economy, and stocks of mineral and energy resources. But the SEEA-Energy framework also includes **other energy-related economic stocks and flows** that countries may consider as **additional tools** for achieving energy-related environmental policy objectives.

Click on the fields to see more!

Navigation icons: Home, Previous, Next, Bookmarks

2.19 Main types of SEEA Energy accounts and tables

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES 19 / 22 SEEA

Main types of SEEA-Energy accounts and tables

At the end of this chapter, let's take a quick look at the accounts and tables in SEEA-Energy. As in SEEA CF, there are basically two types: **Supply and use tables**, for recording flows of energy; and **asset accounts**, for recording stocks of energy resources and changes over time. All other accounts and tables are variations or combinations of these types of accounts.

Click through the tables to find out more!

SUPPLY TABLE						
	Industries	Households	Accumulation	Rest of the World	Environment	Totals
Energy from natural inputs					Energy inputs from the environment	Total supply of energy from natural inputs
Energy products	Output			Imports		Total supply of energy products
Energy residuals	Energy residuals generated by industry	Energy residuals generated by household consumption	Energy residuals from accumulation	Energy residuals received from the rest of the world	Energy residuals recovered from the environment	Total supply of energy residuals

USE TABLE						
	Industries	Households	Accumulation	Rest of the World	Environment	Totals
Energy from natural inputs	Extraction of energy from natural inputs					Total use of energy from natural inputs
Energy products	Intermediate consumption	Household consumption	Changes in inventories	Exports		Total use of energy products
Energy residuals	Collection & treatment of energy residuals		Accumulation of energy residuals	Energy residuals sent to the rest of the world	Energy residual flows direct to environment	Total use of energy residuals

Physical supply and use tables record the flows of energy from the environment, within the economy and back to the environment in joules. For example, oil that is extracted from the environment would be recorded twice: as being supplied by the environment as an energy from natural input, and a corresponding entry as an energy from natural input being used by the mining industry in the use table

Navigation icons: Home, Previous, Next, Bookmarks

Untitled Layer 1 (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES19 / 22SEEA

Main types of SEEA-Energy accounts and tables

At the end of this chapter, let's take a quick look at the accounts and tables in SEEA-Energy. As in SEEA CF, there are basically two types: **Supply and use tables**, for recording flows of energy; and **asset accounts**, for recording stocks of energy resources and changes over time. All other accounts and tables are variations or combinations of these types of accounts.

Click through the tables to find out more!

Monetary supply and use tables articulate, in monetary terms, the flows of energy products within an economy and between different economic units:

- They utilize the same organizational principles and characteristics as the PSUT.
- Nevertheless, while the PSUT contain three main types of flows (energy from natural inputs, products and residuals), the monetary supply and use table for energy records only those flows related to energy products.

	Industries	Households	Government	Accumulation	Rest of the world	Total
Supply table						
Energy products	Output				Imports	Total supply
Use table						
Energy products	Intermediate consumption	Household final consumption expenditure	Government final consumption expenditure	Changes in inventories	Exports	Total use
	Value added					

Untitled Layer 2 (Slide Layer)

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES19 / 22SEEA

Main types of SEEA-Energy accounts and tables

At the end of this chapter, let's take a quick look at the accounts and tables in SEEA-Energy. As in SEEA CF, there are basically two types: **Supply and use tables**, for recording flows of energy; and **asset accounts**, for recording stocks of energy resources and changes over time. All other accounts and tables are variations or combinations of these types of accounts.

Click through the tables to find out more!

Opening stock of resources		
Additions to stock of resources		
	Growth in stock	
	Discoveries of new stock	
	Upwards reappraisals	
	Reclassifications	
	Total additions to stock	
Reductions in stock of resources		
	Extractions	
	Normal loss of stock	
	Catastrophic loss	
	Downwards reappraisals	
	Reclassifications	
	Total reductions in stock	
Revaluation of the stock of resources ^a		
Closing stock of resources		


^a Only applicable for asset accounts in monetary terms

Asset accounts record the stocks of energy (stocks of natural resources or inventories of energy products) at the beginning and end of a period, and all types of changes in the stocks during the period.

The same entries are made in monetary terms, although an additional term is included to record revaluations of resource stocks due to shifts in the price of the resources.





2.20 Summary

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Summary

- Definitions, accounting structures and classifications in SEEA-Energy are the same as in SEEA CF and the SNA.
- A few energy specific concepts and classifications have also been added from the International Recommendation of Energy Statistics (IRES).
- The use of the residence principle instead of the territory principle distinguishes SEEA-Energy from energy statistics and energy balances.
- There are two main types of energy accounts: supply and use tables for recording energy flows; and asset accounts for recording stocks and changes in them.
- Three main components are recorded in SEEA-Energy physical supply and use tables: natural inputs, products and residuals.
- For the physical accounts, the use of a common unit, e.g. joules, is recommended. For industry classification, the UN classification ISIC (International Standard Industry Classification) is recommended.
- If both physical and monetary accounts are used, they can be combined, due to their coherence.
- There are a number of other account related to the energy sector that country can compile to support policy makers such as expenditures, taxes and subsidies, and inventories of energy products.



2.21 Where can you find more information?

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Where can you find more information?

This module is based on **Chapter 2 The – SEEA-Energy framework** in the SEEA-Energy publication. This publication can be downloaded from the UNSD website: https://seea.un.org/sites/seea.un.org/files/documents/seea-energy_final_web.pdf

Details on SNA concepts and definitions (residence principle, production, consumption accumulation, etc. can be found in SNA 2008, and in summary in SEEA CF:
<https://seea.un.org/content/seea-central-framework>
<http://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf>


The UNSD website contains a registry of classifications. You'll find the **ISIC and CPC classifications** there:
<http://unstats.un.org/unsd/class/default.asp>

The **SIEC classification** of energy products according to the International Recommendation of Energy Statistics, IRES, is found in the following publication:
<http://unstats.un.org/unsd/energy/i-res/>



2.22 Last page

MODULE 2: DEFINITIONS AND ACCOUNTING STRUCTURES

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Last page...




This is the last screen in Module 2 of the in-depth training on energy statistics.

We hope that, after this introduction, you're now feeling prepared to commence with

Module 3: Physical supply and use tables

Thanks for learning!






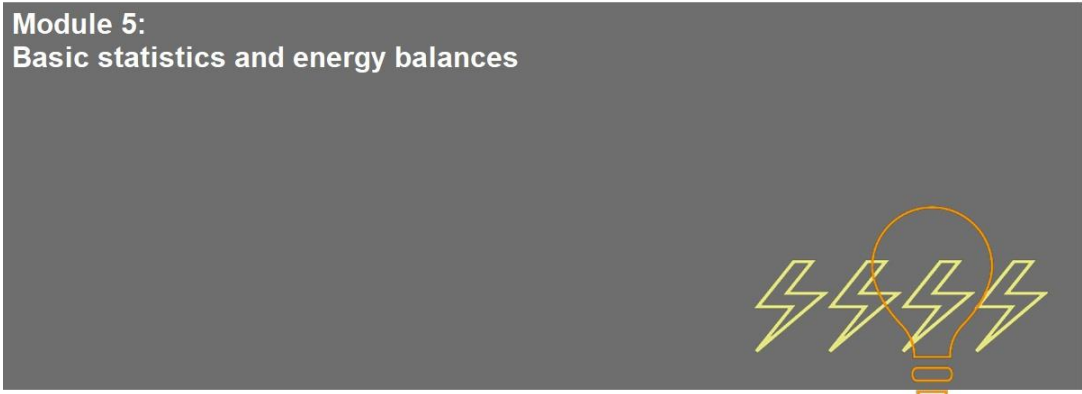
3. Module 5 - Basic statistics and energy balance




3.1 Welcome

WELCOME

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Module 5: Basic statistics and energy balances





Notes:

3.2 Welcome...

MODULE #: #

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Welcome


... to **Module 5: Basic statistics and energy balances!**




This module is about basic statistics and energy balances and how compilers can use these data collections when compiling SEEA-Energy accounts. The topics covered are:

- Energy statistics, energy accounts and energy balances
- From basic energy statistics to energy balances
- Structure of energy balances
- From energy balances to energy accounts
- Bridge tables linking energy balances and energy accounts
- Differences in terminology
- Comparison of energy statistics, balances and accounts

We appreciate your interest in accounting for energy.

Thanks for learning!





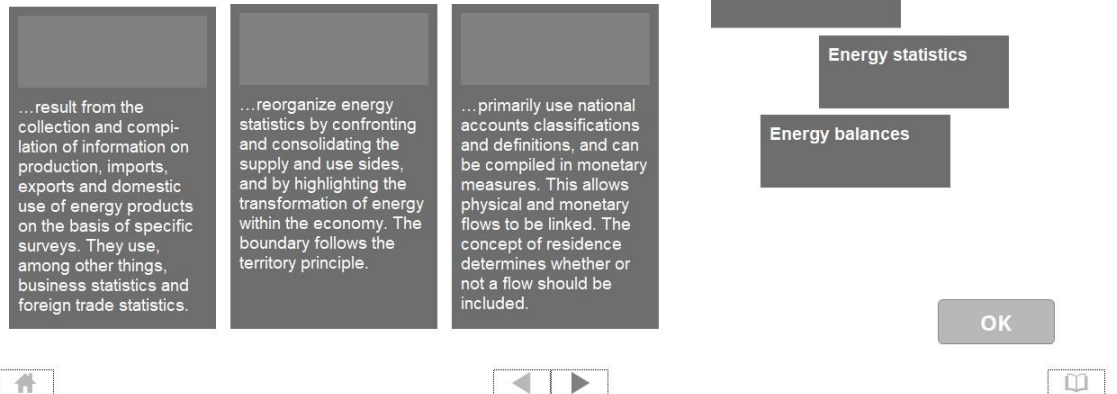
3.3 Energy statistics, energy accounts and energy balances

(Drag and Drop, 10 points, 1 attempt permitted)

Energy statistics, energy accounts and energy balances

Energy statistics, energy accounts and energy balances all provide information on energy supply and use. Can you sort out which is which?

Drag the titles to their descriptions!



The interface shows three description boxes on the left and three title boxes on the right. The descriptions are:

- ...result from the collection and compilation of information on production, imports, exports and domestic use of energy products on the basis of specific surveys. They use, among other things, business statistics and foreign trade statistics.
- ...reorganize energy statistics by confronting and consolidating the supply and use sides, and by highlighting the transformation of energy within the economy. The boundary follows the territory principle.
- ...primarily use national accounts classifications and definitions, and can be compiled in monetary measures. This allows physical and monetary flows to be linked. The concept of residence determines whether or not a flow should be included.

The titles to be dragged are:

- Energy accounts
- Energy statistics
- Energy balances

At the bottom right is an "OK" button. Navigation icons (home, back, forward, and a book icon) are at the bottom.

Drag Item	Drop Target
Energy statistics	Target 1
Energy balances	Target 2
Energy accounts	Target 3

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:


Both energy balances and energy accounts apply the principle that supply equals use, but have different scope and use different concepts and classifications to meet different needs. It is important to note that the measurement of flows in monetary terms, and linking them to physical flows, is only possible in energy accounts.

Feedback when incorrect:

Both energy balances and energy accounts apply the principle that supply equals use, but have different scope and use different concepts and classifications to meet different needs. It is important to note that the measurement of flows in monetary terms, and linking them to physical flows, is only possible in energy accounts.

Very good! (Slide Layer)

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES

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Energy statistics, energy accounts and energy balances

Energy statistics, energy accounts and energy balances all provide information on energy supply and use. Can you sort out which is which?

Drag the titles to their descriptions!

...result from the collection and compilation of information on production, imports, exports and domestic use of energy products on the basis of specific surveys. They use, among other things, business statistics and foreign trade statistics.

...reorganize energy statistics by confronting and consolidating the supply and use sides, and by highlighting the transformation of energy within the economy. The boundary follows the territory principle.

...primarily use national accounts classifications and definitions, and can be compiled in monetary measures. This allows physical and monetary flows to be linked. The concept of residence determines whether or not a flow should be included.


Very good!

Both energy balances and energy accounts apply the principle that supply equals use, but have different scope and use different concepts and classifications to meet different needs. It is important to note that the **measurement of flows in monetary terms, and linking them to physical flows**, is only possible in energy accounts.

Continue

Not quite right. Take a look at the solution (Slide Layer)

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES

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Energy statistics, energy accounts and energy balances

Energy statistics, energy accounts and energy balances all provide information on energy supply and use. Can you sort out which is which?

Drag the titles to their descriptions!

Energy statistics
...result from the collection and compilation of information on production, imports, exports and domestic use of energy products on the basis of specific surveys. They use, among other things, business statistics and foreign trade statistics.

Energy balances
...reorganize energy statistics by confronting and consolidating the supply and use sides, and by highlighting the transformation of energy within the economy. The boundary follows the territory principle.

Energy accounts
...primarily use national accounts classifications and definitions, and can be compiled in monetary measures. This allows physical and monetary flows to be linked. The concept of residence determines whether or not a flow should be included.


Not quite right. Take a look at the solution

Both energy balances and energy accounts apply the principle that supply equals use, but have different scope and use different concepts and classifications to meet different needs. It is important to note that the **measurement of flows in monetary terms, and linking them to physical flows**, is only possible in energy accounts.

Continue

3.4 Basic energy statistics

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES

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Basic energy statistics

The purpose of basic energy statistics is to **provide information on stocks and flows of individual energy products** in non-standardized formats.





Hover over the headlines to see more!

Scope

Main energy flows

Terminology

International Reporting



3.5 Basic energy balances

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES
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SEEA

Basic energy balances

Energy balances show the relationship between energy products and flows. For each energy product, the supply equals the final consumption. Energy balances are designed to:

- Enhance the relevance of basic energy statistics by providing comprehensive and reconciled data.
- Provide comprehensive information on energy supply and demand in order to understand the energy security situation, the effective functioning of energy markets and other relevant policy goals.
- Serve as a quality tool to ensure completeness, consistency and comparability of basic statistics.

All flows in energy balances are represented in a common unit and energy products are classified by the Standard International Energy Product Classification (SIEC).

Item code	Flows	Energy products					
		E1	E2	E3	...	Total	of which: Renewables
1.1	Primary production						
1.2	Imports						
1.3	Exports						
1.4	International Bankers						
1.5	Stock change (closing-opening)						
2	Total energy supply						
3	Statistical difference						
4	Transformations						
5	Transformation processes						
6	Energy Industries own use						
7	Losses						
7.1	Final consumption						
7.1.1	Final energy consumption						
7.1.1.1	Manufacturing, const. and non-fuel mining industries, Total						
7.1.1.1.1	Iron and steel						
7.1.1.1.2	Chemical and petrochemical						
7.1.1.1.X	Other Industries						
7.1.2	Transport, total						
7.1.2.1	Road						
7.1.2.2	Rail						
7.1.2.3	Domestic aviation						
7.1.2.4	Domestic navigation						
7.1.2.X	Other Transport						
7.1.3	Other, total						
7.1.3.1	Of which: Agriculture, forestry and fishing						
7.1.3.2	Of which: Households						
7.2	Non energy use						

Template of an aggregated energy balance

3.6 From basic energy statistics to energy balances

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SEEA

From basic energy statistics to energy balances

Energy balances provide guidance for data compilation and reconciliation on all energy products entering, exiting and used within the territory. Do you know the steps needed to go from basic energy statistics to energy balances?

Click on the fields to find out more!

3.7 Structure of energy balances

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES 7 / 14 SEEA

Structure of energy balances

The energy balance consists of **three main blocks**. The item **statistical difference** bridges the supply and final consumption.

Explore the highlighted fields to learn more!

The middle block shows how energy is transformed, transferred, used by energy

Final consumption is grouped into three main categories: Manufacturing, transport and other:

- The categories should be further disaggregated as applicable.
- The term **final energy consumption**, within the energy balances, excludes the use of energy products as input into transformation and own use by energy industries and other energy producers.
- In the energy balances, energy use related to road, rail, air, sea and pipeline transport are placed under the separate aggregate item of **transport**. Exceptions to this are energy used for fishing vessels and energy use for tractors and other off-road vehicles. In contrast, the energy accounts attribute the consumption of fuels by transport activities to the industries actually using these fuels.

1.1	Primary production
1.2	Imports
1.3	Exports
1.4	International Bunkers
1.5	Stock change (closing-opening)
1	Total energy supply
2	Statistical difference
3	Transfers
4	Transformation processes
5	Energy Industries own use
6	Losses
7	Final consumption
7.1	Final energy consumption
7.1.1	Manufacturing, const. and non-fuel mining industries, Total
	Iron and steel
	Chemical and petrochemical
	Other Industries
7.1.2	Transport, total
	Road
	Rail
	Domestic aviation
	Domestic navigation
	Other Transport
7.1.3	Other, total
	Of which: Agriculture, forestry and fishing
	Of which: Households
7.2	Non energy use

3.8 From energy balances to energy accounts

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From energy balances to energy accounts

When a country starts its work on SEEA-Energy accounts, energy statistics and energy balances are likely to provide the vast bulk of the required basic data. The most efficient way to implement energy accounts is to make **adjustments to existing energy statistics and energy balances**. Do you know the steps needed to go from energy balances to energy accounts?

Click on the fields to find out more!

```
graph LR; A((Adjustments to imports/exports)) --> B((Other adjustments for geographical coverage)); B --> C((Reallocation and regrouping of data to the relevant ISIC division/class)); C --> D((Additional data items necessary for the compilation of energy accounts));
```

3.9 Bridge tables linking energy balances and energy accounts

Bridge tables linking energy balances and energy accounts

In order to show the links between the main concepts and aggregates of the energy accounts and the underlying energy statistics and energy balances, countries may **choose to compile bridge tables**. They show the **additions and subtractions needed to reconcile the energy accounts and energy balances**.

Hover over the tables to see more!

Bridge table for domestic supply and total supply

The table starts with the supply as presented in the energy balances.

Bridge table for final consumption and end use of energy

The table opens with the final consumption of energy as presented (and defined) within the energy balances.

International marine bunkers, exports, inventory changes and purchases by residents abroad are added in order to reach the end use as recorded in SEEA-Energy.

	Supply (Energy Balances)	International marine bunkers	Exports	Accumulations	Purchased by residents abroad	Supply (SEEA-Energy)
Coal	244.1		1.9	-21.0		225
Peat and peat products						
Oil shale/oil sands						
Natural gas (extracted)	393					393
Natural gas (distributed)	166.1		201.0	2.0		369.1
Oil (e.g. conventional crude oil)	360		361.0			721
Oil (oil products)	906	44	80.0	-3.0	160	1277
Biofuels	7					7
Waste	109.1		1.0	0.3		110.4
Electricity	134		100.0			234
Heat	78.5					78.5
Nuclear fuels and other fuels use						

	Final consumption (Energy Balances)	International marine bunkers	Exports	Accumulations	Energy received use of energy for supporting activities	Purchased by residents abroad	End use (SEEA-Energy)
Coal	71.1		1.9	-21.0			2
Peat and peat products							
Oil shale/oil sands							
Natural gas (extracted)							
Natural gas (distributed)	77.1		201.0	2.0			280.1
Oil (e.g. conventional crude oil)	930		361.0				1291
Oil (oil products)	44	44	80.0	-3.0	0.0	160	301
Biofuels	7						7
Waste	78.1		1.0	0.3			79.4
Electricity	131		100.0		3.0		234
Heat	76.5				2.0		78.5
Nuclear fuels and other fuels use							

3.10 Differences in terminology

(Multiple Response, 10 points, 1 attempt permitted)

Differences in terminology

The comprehensive description of the flows in the energy accounts is consistent with the system of national accounts. Some of the flows described in the basic energy statistics and energy balances can be shown directly in the accounts. With others, compilers should be aware of differences in terminology. Do you know how the **energy accounts** deal with the items given below?

Check all answers you consider to be correct!

- ☒ In the energy accounts, intermediate consumption, households final consumption, exports, international bunkers and stock changes are considered to be uses.
- ☒ In the energy accounts, final consumption refers to households' use of energy only.
- ☒ Stocks and changes in stocks as defined in the energy balances are equal to inventories and changes in inventories as defined in the energy accounts.

OK

Correct	Choice
X	In the energy accounts, intermediate consumption, households final consumption, exports, international bunkers and stock changes are considered to be uses.
X	In the energy accounts, final consumption refers to households' use of energy only.
X	Stocks and changes in stocks as defined in the energy balances are equal to inventories and changes in inventories as defined in the energy accounts.

Feedback when correct:

Even though there are many similarities between energy balances and energy accounts, some crucial differences exist:

Differences in terminology and concepts, e.g. in the energy balance, final consumption refers to the use of fuels, electricity and heat delivered to final consumers (industries or households)

Conceptual differences including territory principle / residence principle

Treatment of transport

Feedback when incorrect:

Even though there are many similarities between energy balances and energy accounts, some crucial differences exist:


Differences in terminology and concepts, e.g. in the energy balance, final consumption refers to the use of fuels, electricity and heat delivered to final consumers (industries or households)

Conceptual differences including territory principle / residence principle

Treatment of transport

Very good! (Slide Layer)

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES

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Differences in terminology

The comprehensive description of the flows in the energy accounts is consistent with the system of national accounts. Some of the flows described in the basic energy statistics and energy balances **be shown directly** in the accounts. With others, compilers should be aware of differences in terminology. Do you know how the **energy accounts** deal with the items given below?

Check all answers you consider to be correct!

- ☒ In the energy accounts, intermediate consumption, households final consumption, exports, international bunkers and stock changes are considered to be uses.
- ☒ In the energy accounts, final consumption refers to households' use of energy only.
- ☒ Stocks and changes in stocks as defined in the energy balances are equal to inventories and changes in inventories as defined in the energy accounts.

Very good!


Even though there are many similarities between energy balances and energy accounts, some crucial differences exist:

- Differences in terminology and concepts, e.g. in the energy balance, final consumption refers to the use of fuels, electricity and heat delivered to final consumers (industries or households)
- Conceptual differences including territory principle / residence principle
- Treatment of transport

[Continue](#)

Not quite right. All answers are correct! (Slide Layer)

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES

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Differences in terminology

The comprehensive description of the flows in the energy accounts is consistent with the system of national accounts. Some of the flows described in the basic energy statistics and energy balances be shown directly in the accounts. With others, compilers should be aware of differences in terminology. Do you know how the energy accounts deal with the items given below?

Check all answers you consider to be correct!

☒

In the energy accounts, intermediate consumption, households final consumption, exports, international bunkers and stock changes are considered to be uses.

☒

In the energy accounts, final consumption refers to households' use of energy only.

☒

Stocks and changes in stocks as defined in the energy balances are equal to inventories and changes in inventories as defined in the energy accounts.


Not quite right. All answers are correct!

Even though there are many similarities between energy balances and energy accounts, some crucial differences exist:

- Differences in terminology and concepts, e.g. in the energy balance, final consumption refers to the use of fuels, electricity and heat delivered to final consumers (industries or households)
- Conceptual differences including territory principle / residence principle
- Treatment of transport

Continue

3.11 Untitled Slide





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Comparison of energy statistics, balances and accounts

In light of the difference between the statistics and accounts, countries are encouraged to clearly document the methods used for reallocating and adjusting data from basic energy statistics and balances when creating the energy accounts. They should also make this documentation available.


Click on the empty lines to see more!

Energy statistics	Energy balances	Energy accounts






3.12 Summary

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES

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Summary

- Basic energy statistics serve product/flow specific purposes. Energy balances offer a framework for the analysis of energy flows. Energy accounts are designed to analyze the relationship between flows of energy and macro economic development.
- The energy balance consists of three main blocks
 - The top block shows flows representing energy entering and leaving the national territory, as well as stock changes. This provides information on the supply of energy in the national territory during the reference period.
 - The middle block shows how energy is transformed, transferred, used by energy industries for own use, or lost in distribution and transmission.
 - The bottom block shows flows reflecting the final energy consumption and non-energy use of energy products.
- Energy accounts are fully compatible with national accounts, whereas energy balances follow another structure and have another boundary.
- The most efficient way to implement energy accounts is to make adjustments to existing energy statistics and energy balances. This includes adjusting imports/exports and geographical coverage, reallocating and regrouping data to the relevant ISIC division/class, and adding additional data items as necessary.
- In order to show the links between the main concepts and aggregates of the energy accounts and the underlying energy statistics and energy balances, countries may choose to compile bridge tables. They show the additions and subtractions needed to reconcile the energy accounts and energy balances.



3.13 Where can you find more information?

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES

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Where can you find more information?

UN: International Recommendations for Energy Statistics
<http://unstats.un.org/unsd/energy/ires/>

UN: Energy Statistics Compilers Manual
<http://unstats.un.org/unsd/energy/ESCM.htm>


Eurostat: Physical Energy Flow Accounts (PEFA builder)
<http://ec.europa.eu/eurostat/web/environment/methodology>

UN: SEEA-Energy Manual
https://seea.un.org/sites/seea.un.org/files/documents/seea-energy_final_web.pdf



Explanation 1 (Slide Layer)

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES

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Where can you find more information?

UN: International Recommendations for Energy Statistics
<http://unstats.un.org/unsd/energy/ires/>

UN: Energy Statistics Compilers **Aquastat is FAO's global water information system, developed by the Land and Water Division.**
<http://unstats.un.org/unsd/energy/>


Eurostat: Physical Energy Flow Accounts (PEFA builder)
<http://ec.europa.eu/eurostat/web/environment/methodology>

UN: SEEA-Energy Manual
https://seea.un.org/sites/seea.un.org/files/documents/seea-energy_final_web.pdf



Explanation 2 (Slide Layer)

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES

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Where can you find more information?





UN: International Recommendations for Energy Statistics
<http://unstats.un.org/unsd/energy/ires/>

UN: Energy Statistics Compilers Manual
<http://unstats.un.org/unsd/energy/ESCM.htm>

Eurostat: Physical Energy Flow Accounts (PEFA builder)
<http://ec.europa.eu/eurostat/web/environment/methodology>


UN: SEEA-Energy Manual
https://seea.un.org/sites/seea.un.org/files/documents/seea-energy_final_web.pdf

WCDMP is a sub-program of the World Climate Programme (WCP), and provides international coordination of the WMO Climate System Monitoring.



Explanation 3 (Slide Layer)

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES

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Where can you find more information?





UN: International Recommendations for Energy Statistics
<http://unstats.un.org/unsd/energy/ires/>

UN: Energy Statistics Compilers Manual
<http://unstats.un.org/unsd/energy/ESCM.htm>

Eurostat: Physical Energy Flow Accounts (PEFA builder)
<http://ec.europa.eu/eurostat/web/environment/methodology>


UN: SEEA-Energy Manual
https://seea.un.org/sites/seea.un.org/files/documents/seea-energy_final_we

WHYCOS is a framework programme from the World Meteorological Organization. It's dedicated to improving basic observation activities, strengthening international cooperation and promoting the free exchange of data in the hydrology field.



3.14 Last Page

MODULE 5: BASIC STATISTICS AND ENERGY BALANCES

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Last page ...





This is the last screen in Module 5 of the in-depth training on energy statistics.

We hope that, after learning how to transfer basic statistics and energy balances into the SEEA energy accounts, you're now feeling prepared to commence with

Module 6: Practical guidance for implementation

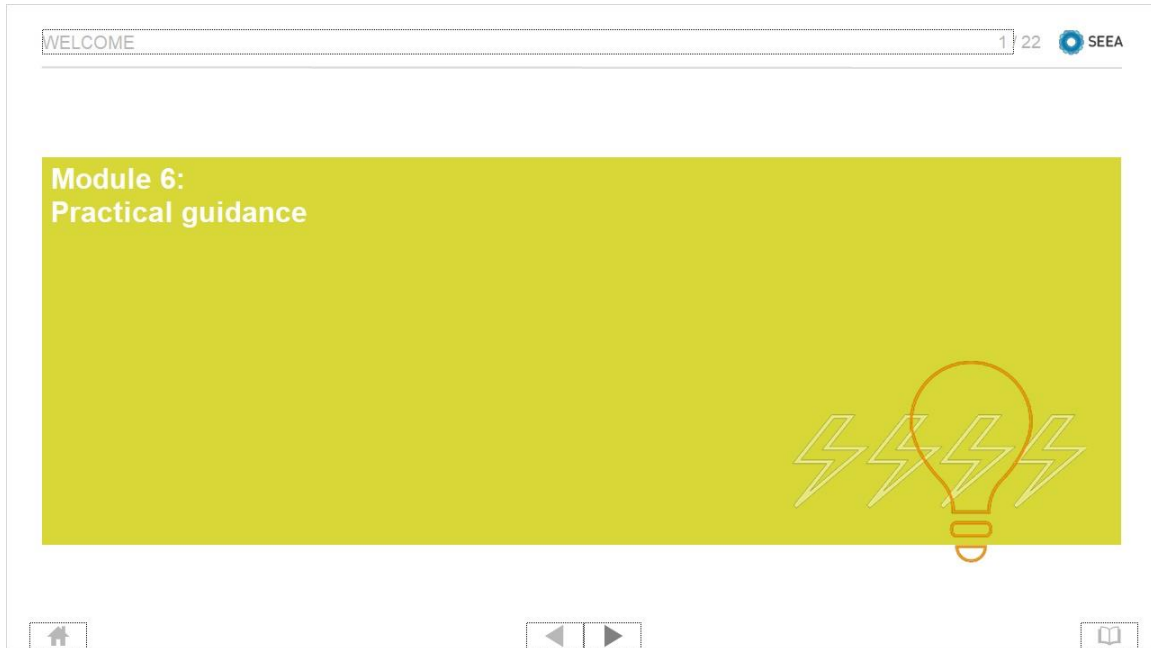
Thanks for learning!





4. Module 6 - Practical guidance

4.1 Welcome



Notes:

4.2 Welcome...

MODULE 6: PRACTICAL GUIDANCE

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SEEA

Welcome...


... to **Module 6: Practical guidance!**


This module provides practical guidance for the implementation of SEEA-Energy. The topics covered are:

- Policy demands and indicators
- Legal framework
- Institutional Arrangements
- First steps toward implementation
- The Generic Statistical Business Process Model
- Implementation of PSUT
- Implementation of asset accounts
- Dissemination and supporting materials

We appreciate your interest in accounting for energy.

Thanks for learning!





4.3 Policy demands

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SEEA

Policy demands


SEEA-Energy accounts provide a good understanding of supply and use is necessary for both improving the management of energy natural resource inputs as well as future planning. Such information is also crucial for deriving a number of indicators, e.g. augmenting this data

- They provide data on the energy sector and the economy.
- The energy sector is an important player in the economy at large. As such, the monetary data collected via the energy accounts are invaluable tools for properly understanding the role of this sector in the economy.
- Increased efficiency in energy use and decreasing energy intensities can contribute to sustainable development. A good understanding of supply and use is necessary for both improving the management of energy natural resource inputs as well as future planning. Such information is also crucial for deriving a number of indicators, e.g. augmenting this data
- Energy accounts can help in clarifying the relationship between the energy sector and some components of the environment. Energy-related air emissions are important because of their direct impact, while renewable sources of energy create less pressure on the environment. The data are also necessary for the derivation of air quality and climate change indicators.

Explore the SEEA-Energy table of contents

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SEEA-Energy's table of contents



4.4 Indicators drawn from SEEA Energy and SNA

(Drag and Drop, 10 points, 1 attempt permitted)

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Indicators drawn from SEEA-Energy and SNA

Linking indicators to a coherent accounting framework helps to ensure coherence in the information and increases transparency. This table lists three questions of policy relevance upon which indicators drawn from the SEEA and SNA data can inform on. Can you fill them in?

Drag in the indicators into the table!





Policy questions	Indicators	Data sources SEEA	Data sources SNA
Decoupling: Can economic growth happen without a similar increase in energy use?		Physical supply-use tables for energy	Production account
Are expenditures on energy becoming relatively more or less burdensome for households?		Monetary supply-use tables for energy	Account for secondary distribution of income
How many years of energy extraction is left if extraction continues as now?		Physical asset accounts for energy	

Energy use divided by GDP

Share of household income spent on fuel and electricity

Resources-to-production ratio

OK



Drag Item	Drop Target
Energy use divided by GDP	Target 1
Share of household income spent on fuel and electricity	Target 2
Resources-to-production ratio	Target 3

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target

Delay item drop states until interaction is submitted

Feedback when correct:


Find out more about the issues on the next screen!

Feedback when incorrect:

Find out more about the issues on the next screen!

Correct (Slide Layer)

MODULE 6: PRACTICAL GUIDANCE

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Indicators drawn from SEEA-Energy and SNA

Linking indicators to a coherent accounting framework helps to ensure coherence in the information and increases transparency. This table lists three questions of policy relevance upon which indicators drawn from the SEEA and SNA can be used. Can you fill them in?

Drag in the indicators into the table!

Policy questions	Indicators	Data sources SEEA	Data sources SNA
Decoupling: Can economic growth happen without a similar increase in energy use?		Physical supply-use tables for energy	Production account
Are expenditures on energy becoming relatively more or less burdensome for households?		Monetary supply-use tables for energy	Account for secondary distribution of income
How many years of energy extraction is left if extraction continues as now?		Physical asset accounts for energy	


Correct

Find out more about the issues on the next screen!

Continue

Not quite right. Take a look at the solution. (Slide Layer)

MODULE 6: PRACTICAL GUIDANCE

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Indicators drawn from SEEA-Energy and SNA

Linking indicators to a coherent accounting framework helps to ensure coherence in the information and increases transparency. This table lists three questions of policy relevance upon which indicators drawn from the SEEA and SNA can be used. Can you fill them in?

Drag in the indicators into the table!

Policy questions	Indicators	Data sources SEEA	Data sources SNA
Decoupling: Can economic growth happen without a similar increase in energy use?	Energy use divided by GDP	Physical supply-use tables for energy	Production account
Are expenditures on energy becoming relatively more or less burdensome for households?	Share of household income spent on fuel and electricity	Monetary supply-use tables for energy	Account for secondary distribution of income
How many years of energy extraction is left if extraction continues as now?	Resources-to-production ratio	Physical asset accounts for energy	


Not quite right. Take a look at the solution.

Find out more about the issues on the next screen!

Continue

4.5 Analyzing questions of policy relevance

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Analyzing questions of policy relevance





Let's get into some more details about the previous examples: A good understanding of how energy is supplied and how it is used is necessary for the improved management of energy natural resource inputs as well as future planning.

Click on the measurement issues to find out more!

Decoupling: Can economic growth happen without a similar increase in energy use?

Are expenditures on energy becoming relatively more or less burdensome for households?

How many years of energy extraction is left if extraction continues as now?



4.6 Sustainable Development Goals (SDGs)

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SEEA

Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) and targets were adopted by the United Nations General Assembly in 2015:

- Goal 7 of the SDGs aims to **ensure access to affordable, reliable, sustainable and modern energy** for all through a number of targets.
- Besides goal 7, a number of other targets in the SDG's could be informed by the energy accounts including two targets in Goal 12 on **ensuring sustainable consumption and production patterns**.
- Compiling the various energy accounts makes it possible to inform multiple targets in an integrated fashion.





4.7 SEEA Energy links with SDG 7

MODULE 6: PRACTICAL GUIDANCE





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SEEA

SEEA-Energy links with SDG 7

How SEEA-Energy links to the targets set for SDG 7 is presented below. **Click on the empty fields to fill them in!**

7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	
7.3 By 2030, double the global rate of improvement in energy efficiency	
7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	
7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support	



4.8 Indicators of SDG 7

(Drag and Drop, 10 points, 1 attempt permitted)

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Indicator for SDG 7.2

Indicators for SDG targets 7.2 can be calculated based on the SEEA-Energy flow accounts.

- Target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix
- In terms of energy accounts, the relevant information includes end use of energy products by industries and households in the PSUT and the part of end use that comes from renewable sources
- Renewable sources include biofuels, waste (partially), hydro, wind, etc.
- Through the use of the accounts, this indicator can also be calculated for different sectors of the economy

Drag the correct data items into the equations!

Indicator 7.2
Renewable energy share in the total final energy consumption

=

Total end use of energy products

Part of end use that comes from renewable sources

OK

Drag Item	Drop Target
Part of end use that comes from renewable sources	Target 1 1
Total end use of energy products	Target 2 1

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:

Renewable energy consumption includes energy derived from: hydro, solid biofuels, wind, solar, liquid biofuels, biogas, geothermal and waste.

The analogous term in the energy balances for the denominator is total final energy consumption which is calculated from national balances and statistics as total final consumption minus non-energy use.


Feedback when incorrect:

Renewable energy consumption includes energy derived from: hydro, solid biofuels, wind, solar, liquid biofuels, biogas, geothermal and waste.

The analogous term in the energy balances for the denominator is total final energy consumption which is calculated from national balances and statistics as total final consumption minus non-energy use.

Very good! (Slide Layer)

MODULE 6: PRACTICAL GUIDANCE

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Indicator for SDG 7.2

Indicators for SDG targets 7.2 can be calculated based on the SEEA-Energy flow accounts.

- Target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix
- In terms of energy accounts, the relevant information includes end use of energy products by households in the PSUT and the part of end use that comes from renewable sources
- Renewable sources include biofuels, waste (partially), hydro, wind, etc.
- Through the use of the accounts, this indicator can also be calculated for different sectors of the economy

Drag the correct data items into the equations!

Indicator 7.2
Renewable energy share in the total final energy consumption

=


Very good!

- Renewable energy consumption includes energy derived from: hydro, solid biofuels, wind, solar, liquid biofuels, biogas, geothermal and waste.
- The analogous term in the energy balances for the denominator is total final energy consumption which is calculated from national balances and statistics as total final consumption minus non-energy use.

Continue

Not quite right. Take a look at the solution! (Slide Layer)

MODULE 6: PRACTICAL GUIDANCE

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Indicator for SDG 7.2

Indicators for SDG targets 7.2 can be calculated based on the SEEA-Energy flow accounts.

- Target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix
- In terms of energy accounts, the relevant information includes end use of energy products by households in the PSUT and the part of end use that comes from renewable sources
- Renewable sources include biofuels, waste (partially), hydro, wind, etc.
- Through the use of the accounts, this indicator can also be calculated for different sectors of the economy

Drag the correct data items into the equations!

Indicator 7.2
Renewable energy share in the total final energy consumption

=

Part of end use that comes from renewable sources

Total end use of energy products

Not quite right. Take a look at the solution!

- Renewable energy consumption includes energy derived from: hydro, solid biofuels, wind, solar, liquid biofuels, biogas, geothermal and waste.
- The analogous term in the energy balances for the denominator is total final energy consumption which is calculated from national balances and statistics as total final consumption minus non-energy use.

Continue

4.9 Indicators of SDG 7

(Drag and Drop, 10 points, 1 attempt permitted)

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Indicator for SDG 7.3

Indicators for SDG targets 7.3 can be calculated based on the SEEA-Energy flow accounts and the relevant value added data from the national accounts.

- Target 7.3 By 2030, double the global rate of improvement in energy efficiency
- In terms of energy accounts, as with SDG 7.2 the relevant information includes end use of energy products by industries and households in the PSUT
- Through the use of the accounts, this indicator can also be calculated for different sectors of the economy
- Value added and GDP data can be found in the national accounts.

Drag the correct data items into the equations!

Indicator 7.3

Energy intensity measured in terms of primary energy and GDP

=

Total end use of energy products

Gross value added

OK

Drag Item	Drop Target
Gross value added	Target 2 1
Total end use of energy products	Target 1 1

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:

By using the same definitions and classifications as the national accounts, information on the end use of energy contained in the PSUT can be directly linked with value added information from the national accounts.

Time series of this indicator can be used to check progress over time


Feedback when incorrect:

By using the same definitions and classifications as the national accounts, information on the end use of energy contained in the PSUT can be directly linked with value added information from the national accounts.

Time series of this indicator can be used to check progress over time

Very good! (Slide Layer)

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Indicator for SDG 7.3

Indicators for SDG targets 7.3 can be calculated based on the SEEA-Energy flow accounts and the relevant value added data from the national accounts.

- Target 7.3 By 2030, double the global rate of improvement in energy efficiency
- In terms of energy accounts, as with SDG 7.2 the relevant information includes end use of energy
- Through the use of the accounts, this indicator can also be calculated for different sectors of the economy
- Value added and GDP data can be found in the national accounts.

Drag the correct data items into the equations!

Indicator 7.3
Energy intensity measured in terms of primary energy and GDP

=


Very good!

- By using the same definitions and classifications as the national accounts, information on the end use of energy contained in the PSUT can be directly linked with value added information from the national accounts.
- Time series of this indicator can be used to check progress over time

Continue

Not quite right. Take a look at the solution! (Slide Layer)

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Indicator for SDG 7.3

Indicators for SDG targets 7.3 can be calculated based on the SEEA-Energy flow accounts and the relevant value added data from the national accounts.

- Target 7.3 By 2030, double the global rate of improvement in energy efficiency
- In terms of energy accounts, as with SDG 7.2 the relevant information includes end use of energy
- Through the use of the accounts, this indicator can also be calculated for different sectors of the economy
- Value added and GDP data can be found in the national accounts.

Drag the correct data items into the equations!

Indicator 7.3
Energy intensity measured in terms of primary energy and GDP

=

Total end use of energy products

Gross value added

Not quite right. Take a look at the solution!

- By using the same definitions and classifications as the national accounts, information on the end use of energy contained in the PSUT can be directly linked with value added information from the national accounts.
- Time series of this indicator can be used to check progress over time

Continue

4.10 Data collection and compilation

Data collection and compilation

Countries starting the process of compiling energy accounts should take a **strategic approach to the implementation** of the SEEA-Energy:

- Countries should make efforts to **learn from the experiences of others**, share best practices and promote relevant standards and strategies that will improve the overall quality of energy data. This improvement may be with regard to completeness or international comparability.
- A lot depends on the specific situation in the individual country regarding **available data and the institutional setup**. Both of these might affect access to relevant data sources.
- Also, it is very important to link the implementation of the energy accounts to relevant **policy demands** from the very beginning.



4.11 Sustainable Development Goals (SDGs)

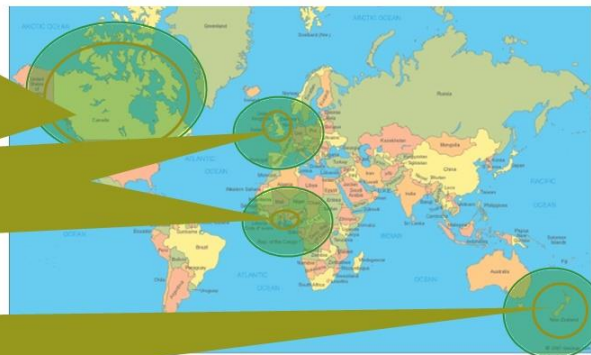
Legal framework

The UK has a decentralized system, but with a Statistics Authority that oversees the main overarching statistical legislation.

The UK's national statistics office coordinates the national statistics system, but ministerial departments are generally responsible for the legal framework used to

Statistics New Zealand is required by law to protect the information it collects. Section 37 of the Statistics Act governs the use of individual information. It specifies that the information collected can only be used for producing statistics, must be kept secure to prevent unauthorized access, and must not be released where it could lead to the disclosure of individuals' details.

All staff are bound by the act until death, and can face individual penalties for infringement.



4.12 Institutional Arrangements

(Drag and Drop, 10 points, 1 attempt permitted)

MODULE 6: PRACTICAL GUIDANCE

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Institutional Arrangements

Institutional arrangements refer to those processes or mechanisms that are put in place to support the collaboration between organizations to manage or improve the functioning of the national statistics program. Can you imagine the solutions to the challenges given below?

Drag the solution to the challenges!

Challenges related to the accessibility of and knowledge about the official country statistics on energy. This could lead to confusion or the proliferation of inconsistent energy-related data sets.

Challenges involved in identifying organizations to collaborate with in the collection, compilation, management and dissemination of energy statistics.





Challenges related to coordinating the various organizations contributing to the collection, compilation, management and dissemination of statistics.

Establishment of working groups for priority setting, harmonization of concepts and data validation and analysis

Designation of one agency responsible for the dissemination of official energy statistics or agencies responsible for specific data sets

Clear definition of roles and responsibilities for relevant agencies and establishment of formal or informal processes that promote collaboration

OK



Drag Item	Drop Target
Designation of one agency responsible for the dissemination of official energy statistics or agencies responsible for specific data sets	Target 1
Clear definition of roles and responsibilities for relevant agencies and establishment of formal or informal processes that promote collaboration	Target 2
Establishment of working groups for priority setting, harmonization of concepts and data validation and analysis	Target 3

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:


Institutional arrangements can be established formally and specified in legislation. For example, a statistical agency may be granted access to all government information holdings for statistical applications.

Feedback when incorrect:

Institutional arrangements can be established formally and specified in legislation. For example, a statistical agency may be granted access to all government information holdings for statistical applications.

Correct (Slide Layer)

MODULE 6: PRACTICAL GUIDANCE

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Institutional Arrangements

Institutional arrangements refer to **those processes or mechanisms that are put in place to support the collaboration between organizations** to manage or improve the functioning of the program. Can you imagine the solutions to the challenges given below?

Drag the solution to the challenges!

Challenges related to the accessibility of and knowledge about the official country statistics on energy. This could lead to confusion or the proliferation of inconsistent energy-related data sets.

Challenges involved in identifying organizations to collaborate with in the collection, compilation, management and dissemination of energy statistics.

Challenges related to coordinating the various organizations contributing to the collection, compilation, management and dissemination of statistics.


Very good!

Institutional arrangements can be established formally and specified in legislation. For example, a statistical agency may be granted access to all government information holdings for statistical applications.

Continue

Incorrect (Slide Layer)

MODULE 6: PRACTICAL GUIDANCE

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Institutional Arrangements

Institutional arrangements refer to **those processes or mechanisms that are put in place to support the collaboration between organizations** to manage or improve the functioning of the program. Can you imagine the solutions to the challenges given below?

Drag the solution to the challenges!

Designation of one agency responsible for the dissemination of official energy statistics or agencies responsible for specific data sets

Challenges related to the accessibility of and knowledge about the official country statistics on energy. This could lead to confusion or the proliferation of inconsistent energy-related data sets.

Clear definition of roles and responsibilities for relevant agencies and establishment of formal or informal processes that promote collaboration

Challenges involved in identifying organizations to collaborate with in the collection, compilation, management and dissemination of energy statistics.

Establishment of working groups for priority setting, harmonization of concepts and data validation and analysis


Challenges related to coordinating the various organizations contributing to the collection, compilation, management and dissemination of statistics.

Not quite right. Take a look at the solution!

Institutional arrangements can be established formally and specified in legislation. For example, a statistical agency may be granted access to all government information holdings for statistical applications.

Continue


4.13 First steps toward implementation




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First steps toward implementation


Energy data collection and compilation are difficult tasks and national practices for them vary greatly. The complex and vast nature of energy supply and use, as well as the liberalization of the energy markets in many countries, have resulted in an **increasing number of governmental agencies and other organizations collecting data and maintaining databases on energy**, such as chambers of commerce, industry associations and regional administrations.

Click on the fields to find out about first steps to take!



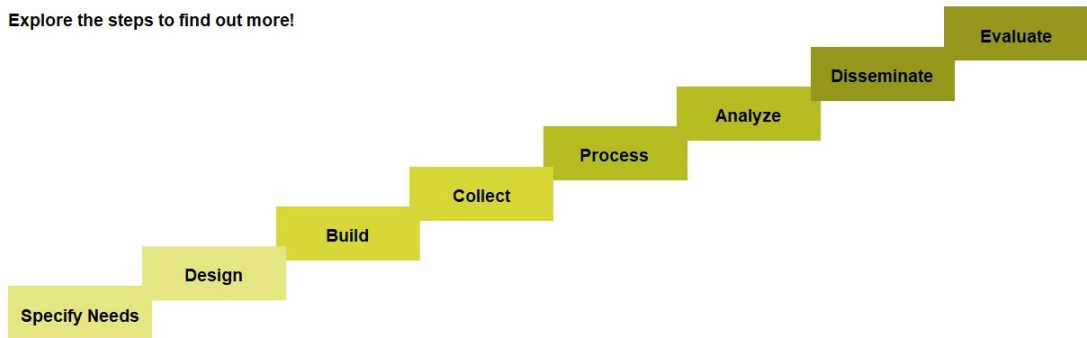
4.14 The Generic Statistical Business Process Model




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The Generic Statistical Business Process Model

The Generic Statistics Business Process Model (GSBPM) can be used to support the compilation of SEEA-Energy accounts. The initial compilation will require several steps that may not be needed for each data cycle but should be **revisited periodically**, in conjunction with regular budget and planning cycles.

Explore the steps to find out more!



4.15 Implementation of PSUT: Data sources

(Multiple Response, 10 points, 1 attempt permitted)

MODULE 6: PRACTICAL GUIDANCE

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Implementation of PSUT: Data sources

The practical implementation of physical flow accounts for energy **depends on the available data sources**. Below you see three different data sources as potential starting points, each entailing different opportunities and challenges. Do you know which data sources can serve as inputs into the energy accounts if available?

Check all answers you consider to be correct!

- ☒ Energy balances
- ☒ Basic energy statistics
- ☒ Other energy-related information available from various statistics
e.g. external trade statistics, production statistics, surveys on industries' use of inputs and private final household consumption surveys

OK



Correct	Choice
X	Energy balances
X	Basic energy statistics
X	Other energy-related information available from various statistics e.g. external trade statistics, production statistics, surveys on industries' use of inputs and private final household consumption surveys

Feedback when correct:

Energy balances as a starting point have the most obvious advantage in that every commodity is already balanced. Thus, supply equals use right from the beginning.

Secondly, all the technical internal consistencies, such as conversion losses in the power supply industries, are quality ensured.

The relationship between input and output in the refineries is also quality assured, i.e. there cannot be more output of oil products than input of crude oil.

Feedback when incorrect:


Energy balances as a starting point have the most obvious advantage in that every commodity is already balanced. Thus, supply equals use right from the beginning.

Secondly, all the technical internal consistencies, such as conversion losses in the power supply industries, are quality ensured.

The relationship between input and output in the refineries is also quality assured, i.e. there cannot be more output of oil products than input of crude oil.

Very good! (Slide Layer)

MODULE 6: PRACTICAL GUIDANCE

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Implementation of PSUT: Data sources

The practical implementation of physical flow accounts for energy **depends on the available data sources**. Below you see three different data sources as potential starting points, each entailing different opportunities and challenges. Do you know which data sources can serve as inputs into the energy accounts if available?

Check all answers you consider to be correct!

- ☒ Energy balances
- ☒ Basic energy statistics
- ☒ Other energy-related information available from various statistics e.g. external trade statistics, production statistics, surveys on industries' use of inputs and private final household consumption surveys


Very good!

- Energy balances as a starting point have the most obvious advantage in that every commodity is already balanced. Thus, supply equals use right from the beginning.
- Secondly, all the technical internal consistencies, such as conversion losses in the power supply industries, are quality ensured.
- The relationship between input and output in the refineries is also quality assured, i.e. there cannot be more output of oil products than input of crude oil.

Continue

Not quite right. All data sources can be used! (Slide Layer)

MODULE 6: PRACTICAL GUIDANCE

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Implementation of PSUT: Data sources

The practical implementation of physical flow accounts for energy **depends on the available data sources**. Below you see three different data sources as potential starting points, each entailing different opportunities and challenges. Do you know which data sources can serve as inputs into the energy accounts if available?

Check all answers you consider to be correct!

- ☒ Energy balances
- ☒ Basic energy statistics
- ☒ Other energy-related information available from various statistics e.g. external trade statistics, production statistics, surveys on industries' use of inputs and private final household consumption surveys

Not quite right. All data sources can be used!


- Energy balances as a starting point have the most obvious advantage in that every commodity is already balanced. Thus, supply equals use right from the beginning.
- Secondly, all the technical internal consistencies, such as conversion losses in the power supply industries, are quality ensured.
- The relationship between input and output in the refineries is also quality assured, i.e. there cannot be more output of oil products than input of crude oil.

Continue

4.16 Implementation of PSUT: Challenges entailed

(Drag and Drop, 10 points, 1 attempt permitted)

MODULE 6: PRACTICAL GUIDANCE

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Implementation of PSUT: Challenges entailed

Energy statistics, energy balances and other data sources come with different challenges when used as a starting point for implementation. Can you sort out which data sources come with which set of challenges, as described below?

Drag the titles to the sets of challenges!

- Industry classification used is not the same as in the energy accounts
- Based on the territory principle rather than the residence principle as needed for the energy accounts

- Not balanced
- Technical internal consistencies need to be worked out
- Industry classification used is not the same as in the energy accounts
- Based on the territory principle rather than the residence principle as needed for the energy accounts





- Not balanced
- Data might not be available in physical units
- Technical internal consistencies need to be worked out
- Industry classification used is not the same as in the energy accounts
- Based on the territory principle rather than the residence principle as needed for the energy accounts

Energy balances

Other data sources

Basic energy statistics

OK



Drag Item	Drop Target
Energy balances	Target 1
Basic energy statistics	Target 2
Other data sources	Target 3

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:


All three starting points have one challenge in common: the residence principle must be adjusted for. In addition to that, ways to organize the use of energy according to ISIC industry must also be found.

Feedback when incorrect:

All three starting points have one challenge in common: the residence principle must be adjusted for. In addition to that, ways to organize the use of energy according to ISIC industry must also be found.

Correct (Slide Layer)

MODULE 6: PRACTICAL GUIDANCE

16 / 22 

Implementation of PSUT: Challenges entailed

Energy statistics, energy balances and other data sources come with different challenges when used as a starting point for implementation. Can you sort out which data sources come with which set of challenges, as described below?

Drag the titles to the sets of challenges!

- Industry classification used is not the same as in the energy accounts
- Based on the territory principle rather than the residence principle as needed for the energy accounts

- Not balanced
- Technical internal consistencies need to be worked out
- Industry classification used is not the same as in the energy accounts
- Based on the territory principle rather than the residence principle as needed for the energy accounts

- Not balanced
- Data might not be available in physical units
- Technical internal consistencies need to be worked out
- Industry classification used is not the same as in the energy accounts
- Based on the territory principle rather than the residence principle as needed for the energy accounts


Very good!

All three starting points have one challenge in common: the residence principle must be adjusted for. In addition to that, ways to organize the use of energy according to ISIC industry must also be found.

Continue

Incorrect (Slide Layer)

MODULE 6: PRACTICAL GUIDANCE

16 / 22 

Implementation of PSUT: Challenges entailed

Energy statistics, energy balances and other data sources come with different challenges when used as a starting point for implementation. Can you sort out which data sources come with which set of challenges, as described below?

Drag the titles to the sets of challenges!

Energy balances	Basic energy statistics	Other data sources
<ul style="list-style-type: none">• Industry classification used is not the same as in the energy accounts• Based on the territory principle rather than the residence principle as needed for the energy accounts	<ul style="list-style-type: none">• Not balanced• Technical internal consistencies need to be worked out• Industry classification used is not the same as in the energy accounts• Based on the territory principle rather than the residence principle as needed for the energy accounts	<ul style="list-style-type: none">• Not balanced• Data might not be available in physical units• Technical internal consistencies need to be worked out• Industry classification used is not the same as in the energy accounts• Based on the territory principle rather than the residence principle as needed for the energy accounts


Not quite right. Take a look at the solution!

All three starting points have one challenge in common: the residence principle must be adjusted for. In addition to that, ways to organize the use of energy according to ISIC industry must also be found.

Continue

4.17 Implementation of PSUT: Starting from energy statistics

MODULE 6: PRACTICAL GUIDANCE

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Implementation of PSUT: Starting from energy statistics





The steps required for **basic energy statistics** as the starting point for building PSUT are presented here. Please note that the **implementation is not a linear process**: Multiple iterations might be necessary because the description of each energy commodity naturally influences the sum of the description of all energy commodities.

Explore the steps to find out more!

Prepare data with common classifications

Compile commodity balances, product by product

Rearrange the commodity balances into the SUT framework



4.18 Implementation of asset accounts

MODULE 6: PRACTICAL GUIDANCE

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Implementation of asset accounts

As with the compilation of flow accounts, SEEA-Energy offers a flexible approach to accounting for stocks of energy resources. You can implement those asset accounts you find **most useful**, depending on the relevant policy questions:

- Start with the **most important resources** and where data are **most readily available**. You can then continue gradually until all resources are covered.
- The accounting structures and identities of the accounts will often help you **estimate missing items**, so data gaps can be overcome, in many cases.
- Note that the implementation of asset accounts will often **require some cooperation** between statistical offices and energy agencies, etc.

Type of mineral and energy resource (Class A: Commercially recoverable resources) (000's currency units)
Opening value of stock of resources
Additions to value of stock
Discoveries
Upwards reappraisals
Reclassifications
Total additions to stock
Reductions in value of stock
Extractions
Catastrophic losses
Downwards reappraisals
Reclassifications
Total reductions in stock
Revaluations
Closing value of stock of resources

4.19 Dissemination and supporting materials

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Dissemination and supporting materials


Energy accounts should be disseminated in line with the **practices followed by official statistics** – meaning that metadata and material that can help with interpretation, such as methodological notes and statements regarding data quality, should be made available.

Click on the fields to see some of our suggestions!






4.20 Summary

MODULE 6: PRACTICAL GUIDANCE

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Summary

- Right from the moment the collection and compilation of energy accounts begins, countries should take a strategic approach to the implementation of SEEA-Energy:
 - Link the implementation to policy demands.
 - Remember, a modular approach is encouraged.
 - Dissemination and supporting materials are equally important.
- The specific situation in the individual country regarding available data has a huge influence. Institutional setups might also affect the ease of access for relevant data sources.
- Integration of energy accounts with other sources of information can provide greater insights for policy makers, researchers, and other users of the accounts.
- A strong legal framework establishes a data collection entity with a mandate and legal authority to collect, compile and disseminate statistics. It also outlines responsibilities for ensuring the privacy of respondents.
- Institutional arrangements refer to those processes or mechanisms put in place to support collaboration between organizations in managing or improving the functioning of the national statistics program.
- Energy balances provide the easiest starting point for physical energy flow accounts, due to the fact that several issues have already been resolved.
- You can implement those asset accounts you find most useful, depending on the policy questions raised. Start with the most important resources and where data are most accessible.



4.21 Where can you find more information?

MODULE 6: PRACTICAL GUIDANCE

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Where can you find more information?

The Generic Statistical Business Process Model

<https://statswiki.unece.org/display/GSBPM/Generic+Statistical+Business+Process+Model>

Fundamental Principles of National Official Statistics

<http://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx>



4.22 Last Page

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Last page ...

This is the last screen in Module 6 of the in-depth training on energy accounts – which means you have finished all the parts of the SEEA-Energy training!


We hope that we provided you with a firm basis of knowledge, so you can work your way through the challenges of accounting for energy.




When stressful obstacles come up during the process, please keep this in mind: In overcoming these problems, you can pride yourself on the fact that you're helping to safeguard the energy supply for future generations!

Thanks!

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seea.un.org





















5. Module 3 - Physical supply and use tables

5.1 Welcome

WELCOME1 / 20 SEEA

Module 3: Physical supply and use tables






Notes:

5.2 Welcome...

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

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Welcome ...





... to **Module 3: Physical supply and use tables!**

This module focuses on the physical energy flow accounts that describe the flows of energy from the environment into the economy and back into the environment. The topics covered are:

- Physical flow accounts for energy
- Structure of the PSUT for energy
- Flows of natural inputs
- Flows within the economy
- Flows to the environment
- Following the flows: Supply equals use

We appreciate your interest in accounting for energy.
Thanks for learning!





5.3 Physical flow accounts for energy

MODULE 3: PHYSICAL SUPPLY AND USE TABLES 3 / 20 SEEA

Physical flow accounts for energy

Physical supply and use tables (PSUT), or flow accounts, describe energy flows in physical units:

- from the initial extraction or energy capture of natural inputs from the environment,
- to flows within the economy, in the form of industries and households' supply and use of energy products;
- and, finally, flows of energy as energy residuals back to the environment.

The diagram illustrates the physical flow accounts for energy. It shows three main components: the Rest of the world economy (top), the National economy (middle), and the National territory (bottom). The Rest of the world economy is divided into Residents on rest of the world territory and Non-residents on national territory. The National economy is divided into Use of energy by industries and households and Natural resource inputs: energy from renewable sources; energy inputs into cultivated biomass. The National territory is divided into Residuals and Extraction and capture of energy. Arrows indicate flows within the economy (blue) and flows between the environment and the economy (green). A legend at the bottom explains the arrow colors: blue for flows within the economy and green for flows between the environment and the economy.

5.4 Repeating entries

(Multiple Response, 10 points, 1 attempt permitted)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES 4 / 20 SEEA

Repeating entries

Energy products are fuels, electricity and heat used as a source of energy. In addition to the end-use of these products, the flow accounts **include energy products that are transformed into other energy products**. Can you figure out the solution that was found for those repeated entries?

Check the one answer you consider correct!

- ☐ Accounts are compiled on a net basis to allow a focus on the end use of energy.
- ☒ Accounts are compiled on a gross basis to show all flows of energy between economic units.

OK

Correct	Choice
	Accounts are compiled on a net basis to allow a focus on the end use of energy.
X	Accounts are compiled on a gross basis to show all flows of energy between economic units.

Feedback when correct:

The record of physical flows in the SEEA is referred to as gross recording. Its advantage is that a full reconciliation of all flows at all levels in the supply and use table can be made.

Feedback when incorrect:

The record of physical flows in the SEEA is referred to as gross recording. Its advantage is that a full reconciliation of all flows at all levels in the supply and use table can be made.

Very good! (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES
4 / 20

Repeating entries

Energy products are fuels, electricity and heat used as a source of energy. In addition to the end-use of these products, the flow accounts **include energy products that are transformed into other energy products**. Can you figure out the solution that was found for those repeated entries?

Check the one answer you consider correct!

☐ Accounts are compiled on a net basis to allow a focus on the end use of energy.
☒ Accounts are compiled on a gross basis to show all flows of energy between economic units.

Very good!

The record of physical flows in the SEEA is referred to as gross recording. Its advantage is that a full reconciliation of all flows at all levels in the supply and use table can be made.

Continue

Not quite right. Take a look at the solution! (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

4 / 20 SEEA

Repeating entries

Energy products are fuels, electricity and heat used as a source of energy. In addition to the end-use of these products, the flow accounts **include energy products that are transformed into other energy products**. Can you figure out the solution that was found for those repeated entries?

Check the one answer you consider correct!

☐ Accounts are compiled on a net basis to allow a focus on the end use of energy.

☒ Accounts are compiled on a gross basis to show all flows of energy between economic units.

Not quite right. Take a look at the solution!

The record of physical flows in the SEEA is referred to as gross recording. Its advantage is that a full reconciliation of all flows at all levels in the supply and use table can be made.

Continue

5.5 Gross and net recording

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

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Gross and net recording

While the PSUT for energy introduced here is compiled on a gross basis, **both gross and net recording can be applied to energy accounts**, depending on purpose:

- Accounts compiled on a **gross basis** show all transformations of energy. These include natural inputs to products in the economy and residuals flowing back into the environment. They allow for the full reconciliation of flows on all levels, according to industry and product.
- Accounts compiled on a **net basis** exclude non-consumptive energy uses that represent the transformation of one energy product to another. This allows for a focus on the end use of energy.

```
graph TD; Input[Input coal / gas / oil] -- gross --> Producers[Energy producers]; Producers --> Households[Households]; Input -- net --> Households;
```

5.6 Units in flow accounts for energy

Units in flow accounts for energy

Physical flow accounts for energy support a **consistent monitoring of supply and use of energy** according to flow type and industry. They can be compiled using data from energy balances, energy surveys and other sources:

- In principle, all natural units can be used, but the accounts become more meaningful when a **common energy unit** is used.
- The SEEA-Energy uses the **joule** as a common unit, which is consistent with the International Recommendations for Energy Statistics (IRES).
- Together with information on prices, the physical energy flow accounts provide the **basis for monetary energy flow accounts**.
- The monetary supply and use table for energy contains information on the **values of energy products** related to the physical flows.



5.7 Structure of the PSUT for energy

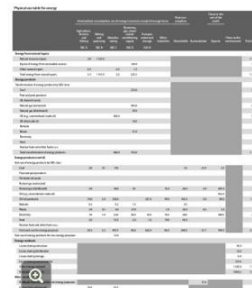
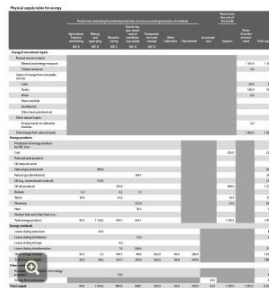
Structure of the PSUT for energy

The PSUT for energy follow the structure of the general PSUT presented in the SEEA:

- While the rows show **types of natural inputs, products and residuals**, the columns display both the activity underlying the flows and the economic units involved.
- Energy products are classified by the **Standard International Energy Product Classification (SIEC)**.
- The **level of industry detail** highlights those industries that usually play a significant role, but the amount of detail is not restricted.
- The **accumulation column** records changes in inventories of energy products that can be stored.

Supply table: Production, generation and supply of: natural inputs, products and residuals organized by different economic units or the environment.

Use table: Consumption and use of: natural inputs, products and residuals organized by different economic units or the environment.



5.8 Structure of the PSUT for energy

Flows of natural inputs

The flow of energy from natural inputs describes the extraction or capture of energy from the environment. Such flows include **energy from natural resource inputs**, **inputs from renewable energy sources**, and **other natural inputs**.

Energy from natural inputs	
Natural resource inputs	
Mineral and energy resources	
	Oil resources
	Natural gas resources
	Coal and peat resources
	Uranium and other nuclear fuels
	Timber resources
Inputs of energy from renewable sources	
	Solar
	Hydro
	Wind
	Wave and tidal
	Geothermal
	Other electricity and heat
Other natural inputs	
	Energy inputs to cultivated biomass
Total energy from natural inputs	

5.9 Energy from renewable sources

Energy from renewable sources

Inputs of energy from renewable sources are **non-fuel sources of energy** provided by the environment and include solar, hydro, wind, wave and tidal, geothermal, other renewable sources of electricity and heat:

- It is essential that natural inputs used in the generation of electricity are recorded so the **balance of flows** of energy between the environment and the economy is **complete**.
- The amount of electricity/heat produced from renewable sources must be shown as a **corresponding (and equal) natural input of energy** from the environment to the economy.
- Inputs of energy sourced from natural resources, energy inputs from cultivated timber resources, other cultivated biomass, or from solid waste are **not included in this part of the PSUT**.



5.10 Ownership of natural energy resources

(Multiple Response, 10 points, 1 attempt permitted)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

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Ownership of natural energy resources

Energy from natural inputs denotes physical flows from the environment to the economy. In the area of energy, they principally derive **from stocks of timber and mineral and energy resources**. Do you know how **ownership is dealt with in accordance to the residence principle** that applies in the SEEA?

Check the one answer you consider to be correct!

☒

All stocks are considered to be owned by residents of the country in which the stocks are located.

☐

Stocks in the territory that are legally owned by non-residents are beyond the scope of the SEEA accounts.

☐

Non-residents owning stocks in the territory will be asked to form a residential branch to comply with SEEA.

OK

Correct	Choice
X	All stocks are considered to be owned by residents of the country in which the stocks are located.
	Stocks in the territory that are legally owned by non-residents are beyond the scope of the SEEA accounts.
	Non-residents owning stocks in the territory will be asked to form a residential branch to comply with SEEA.

Feedback when correct:

By convention, even where these stocks are legally owned by non-residents, they are considered to be owned by a national resident unit and the non-resident legal owner is shown as the financial owner of the national resident unit.

This means that extraction of mineral and energy resources must by definition take place within a country's economic territory, and be conducted by economic units that are resident in that country.


Feedback when incorrect:

By convention, even where these stocks are legally owned by non-residents, they are considered to be owned by a national resident unit and the non-resident legal owner is shown as the financial owner of the national resident unit.

This means that extraction of mineral and energy resources must by definition take place within a country's economic territory, and be conducted by economic units that are resident in that country.

Very good! (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

10 / 20 

Ownership of natural energy resources

Energy from natural inputs denotes physical flows from the environment to the economy. In the area of energy, they principally derive **from stocks of timber and mineral and energy resources**. Do you know how **ownership is dealt with in accordance to the residence principle** that applies in the SEEA?

Check the one answer you consider to be correct!

- ☒ All stocks are considered to be owned by residents of the country in which the stocks are located.
- ☐ Stocks in the territory that are legally owned by non-residents are beyond the scope of the SEEA accounts.
- ☐ Non-residents owning stocks in the territory will be asked to form a residential branch to comply with SEEA.

Very good!

By convention, even where these stocks are legally owned by non-residents, they are considered to be owned by a national resident unit and the **non-resident legal owner is shown as the financial owner** of the national resident unit.

This means that extraction of mineral and energy resources must by definition take place within a country's economic territory, and be conducted by economic units that are resident in that country.

Continue

Not quite right. Take a look at the solution! (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

10 / 20 SEEA

Ownership of natural energy resources

Energy from natural inputs denotes physical flows from the environment to the economy. In the area of energy, they principally derive **from stocks of timber and mineral and energy resources**. Do you know how **ownership is dealt with in accordance to the residence principle** that applies in the SEEA?

Check the one answer you consider to be correct!

☒ All stocks are considered to be owned by residents of the country in which the stocks are located.

☐ Stocks in the territory that are legally owned by non-residents are beyond the scope of the SEEA accounts.

☐ Non-residents owning stocks in the territory will be asked to form a residential branch to comply with SEEA.

Not quite right. Take a look at the solution!

By convention, even where these stocks are legally owned by non-residents, they are considered to be owned by a national resident unit and the **non-resident legal owner is shown as the financial owner** of the national resident unit.

This means that extraction of mineral and energy resources must by definition take place within a country's economic territory, and be conducted by economic units that are resident in that country.

Continue

5.11 Energy products

MODULE 3: PHYSICAL SUPPLY AND USE TABLES





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Energy products

Once energy from natural inputs has been extracted or captured it becomes an energy product. The level of product detail used in the physical flow accounts for energy will depend on both the requirements of data users and data availability. Compilers will need to adapt the product detail used in their physical flow accounts. It is recommended that compilers attempt to produce data at the 2 digit or division level of SIEC in order to deliver a much richer data set for data users.

Explore the table to see the descriptions!

Energy products
Coal
Peat and peat products
Oil shale/ oil sands
Natural gas
Oil
Biofuels
Waste
Electricity
Heat
Nuclear fuels and other fuels nec



5.12 Flows within the economy

(Drag and Drop, 10 points, 1 attempt permitted)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

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Flows within the economy

Energy becomes a product when it enters the economy. This includes **extracted natural resources**, **fuels** that are produced or generated by an economic unit; **electricity** that is generated by an economic unit and **heat** that is generated and sold to third parties by an economic unit. Some energy products may be used for non-energy purposes.

Certain economic activities are a use of energy products (included in the use table) while others would be included in the supply part of the supply and use table. Can you sort out the items below?

Drag the items to their respective table!

Supply

Use

Use of gasoline for private cars

Storage of natural gas for later

Gasoline sold to tourists

Extraction of crude oil by mining industry

Production of electricity

Imports of fuel oil

OK

Drag Item	Drop Target
Extraction of crude oil by mining industry	Target Supply
Imports of fuel oil	Target Supply
Production of electricity	Target Supply
Gasoline sold to tourists	Target Use
Storage of natural gas for later	Target Use
Use of gasoline for private cars	Target Use

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Free)
Delay item drop states until interaction is submitted

Feedback when correct:

Gasoline sold to tourists is an export and is included in the use table. Imports of fuels on the other hand are a supply of energy from outside the territory of reference.

SEEA-Energy provides more information on the role of energy within the economy, the state of mineral and energy resources and energy-related transactions.

Feedback when incorrect:

Gasoline sold to tourists is an export and is included in the use table. Imports of fuels on the other hand are a supply of energy from outside the territory of reference.

SEEA-Energy provides more information on the role of energy within the economy, the state of mineral and energy resources and energy-related transactions.

Correct (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

12 / 20 SEEA

Flows within the economy

Energy becomes a product when it enters the economy. This includes **extracted natural resources**, **fuels** that are produced or generated by an economic unit; **electricity** that is generated by an economic unit and **heat** that is generated and sold to third parties by an economic unit. Some energy products may be used for non-energy purposes.

Certain economic activities are a use of energy products (included in the use table) while others would be included in the supply table. Sort out the items below?

Drag the items to their respective table!

Supply

Use

Gasoline sold to tourists

Very good!

Gasoline sold to tourists is an export and is included in the use table. Imports of fuels on the other hand are a supply of energy from outside the territory of reference.

SEEA-Energy provides more information on the role of energy within the economy, the state of mineral and energy resources and energy-related transactions.

Continue

Incorrect (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

12 / 20 SEEA

Flows within the economy

Energy becomes a product when it enters the economy. This includes **extracted natural resources**, **fuels** that are produced or generated by an economic unit; **electricity** that is generated by an economic unit and **heat** that is generated and sold to third parties by an economic unit. Some energy products may be used for non-energy purposes.

Certain economic activities are a use of energy products (included in the use table) while others would be included in the supply table. Sort out the items below?

Drag the items to their respective table!

Supply

Use

Extraction of crude oil by mining industry

Imports of fuel oil

Production of electricity

Use of gasoline for private cars

Storage of natural gas for later

Gasoline sold to tourists

Not quite right. Take a look at the solution!

Gasoline sold to tourists is an export and is included in the use table. Imports of fuels on the other hand are a supply of energy from outside the territory of reference.

SEEA-Energy provides more information on the role of energy within the economy, the state of mineral and energy resources and energy-related transactions.

Continue

5.13 Imports and exports of energy products

MODULE 3: PHYSICAL SUPPLY AND USE TABLES 13 / 20 SEEA

Imports and exports of energy products

In the PSUT for energy, imports and exports of energy products need to be adjusted for:

- Purchases by residents abroad
- Purchases by non-residents on domestic territory

This table shows the key adjustments that must be made to the foreign trade statistics in order to arrive at the import and export concepts based on the residence principle used in SEEA-Energy. While in theory all the adjustments should be made, in practice data might not be available for all components of the adjustment.

Imports (general trade system) + Energy products purchased by residents abroad <i>Of which:</i> Domestic ships' and fishing vessels' bunkering of oil abroad Domestic planes bunkering of jet fuel and kerosene abroad Domestic vehicles' refuelling of gasoline and diesel abroad Tourists' and business traveller's purchases of energy abroad including fuel for private cars Energy purchased by military bases on foreign territories Energy purchased by national embassies abroad = total imports of energy products
Exports (general trade system) + Energy products sold to non-residents on domestic territory <i>Of which:</i> Foreign ships' and fishing vessels' bunkering of oil on territory Foreign planes bunkering of jet fuel and kerosene on territory Foreign vehicles' refuelling of gasoline and diesel on territory Foreign tourists' and business traveller's purchases of energy on territory including fuel for private cars Energy sold to foreign military bases on national territory Energy sold to foreign embassies on national territory = total exports of energy products

5.14 Flows to the environment

(Multiple Response, 10 points, 1 attempt permitted)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES 14 / 20 SEEA

Flows to the environment

Residuals are flows of solid, liquid and gaseous materials and energy that are discarded, discharged or emitted by establishments and households. They may be created by production, consumption or accumulation. Do you know which of the items below is **not included** in this category?

Check the one answer you consider to be correct!

- ☐ Energy losses during extraction, storage, transformation and production of electricity.
- ☒ Flows to managed landfills, emission capture and storage facilities, treatment plants and other waste disposal sites.
- ☐ Residual flow resulting from the generation of energy from the incineration of solid waste.

OK

Correct	Choice
	Energy losses during extraction, storage, transformation and production of electricity.
X	Flows to managed landfills, emission capture and storage facilities, treatment plants and other waste disposal sites.
	Residual flow resulting from the generation of energy from the incineration of solid waste.

Feedback when correct:

Controlled and managed waste disposal sites are not considered part of the environment. Flows of residuals into these facilities are therefore regarded as flows within the economy.

Subsequent flows from these facilities may lead to the creation of other products or residuals: When waste is combusted for energy purposes, it is recorded separately as energy from solid waste within other residual flows.


Feedback when incorrect:

Controlled and managed waste disposal sites are not considered part of the environment. Flows of residuals into these facilities are therefore regarded as flows within the economy.

Subsequent flows from these facilities may lead to the creation of other products or residuals: When waste is combusted for energy purposes, it is recorded separately as energy from solid waste within other residual flows.

Very good! (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND UNSE TABLES

14 / 20  SEEA

Flows to the environment

Residuals are flows of solid, liquid and gaseous materials and energy that are discarded, discharged or emitted by establishments and households. They may be created by production, consumption or accumulation. Do you know which of the items below is **not included** in this category?

Check the one answer you consider to be correct!

- ☐ Energy losses during extraction, storage, transformation and production of electricity.
- ☒ Flows to managed landfills, emission capture and storage facilities, treatment plants and other waste disposal sites.
- ☐ Residual flow resulting from the generation of energy from the incineration of solid waste.

Very good!


Controlled and managed waste disposal sites are **not considered part of the environment**. Flows of residuals into these facilities are therefore regarded as flows within the economy.

Subsequent flows from these facilities may lead to the creation of other products or residuals: When waste is combusted for energy purposes, it is recorded separately as **energy from solid waste** within other residual flows.

Continue

Not quite right. Take a look at the solution! (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND UNSE TABLES

14 / 20  SEEA

Flows to the environment

Residuals are flows of solid, liquid and gaseous materials and energy that are discarded, discharged or emitted by establishments and households. They may be created by production, consumption or accumulation. Do you know which of the items below is **not included** in this category?

Check the one answer you consider to be correct!

- ☐ Energy losses during extraction, storage, transformation and production of electricity.
- ☒ Flows to managed landfills, emission capture and storage facilities, treatment plants and other waste disposal sites.
- ☐ Residual flow resulting from the generation of energy from the incineration of solid waste.

Not quite right. Take a look at the solution!

Controlled and managed waste disposal sites are **not considered part of the environment**. Flows of residuals into these facilities are therefore regarded as flows within the economy.

Subsequent flows from these facilities may lead to the creation of other products or residuals: When waste is combusted for energy purposes, it is recorded separately as **energy from solid waste** within other residual flows.

Continue

5.15 Energy residuals

Energy residuals

There are different types of residuals that are not usually accounted for as a single type of flow. Rather, **different groups of residuals are analyzed** depending on the physical nature of the flow, the purpose behind the flow or simply to reflect the balance of physical flows leaving the economy:

- Within the context of SEEA-Energy, losses of energy in physical terms are comprised of flows from the economy to the environment **that are not available for further use within the economy**.
- Within this definition, four types of losses of energy are identified **by the stage at which they occur** in the production process.
- Other energy residuals include residuals from end use for energy purposes (e.g. heat dissipated as a result of fuel consumption)
- It is noted that some types of losses may be necessary for maintaining **safe operating conditions** – this accounts for some instances of flaring and venting of natural gas.
- By convention, energy from solid waste is shown as supplied from within the economy in the accumulation column.

Energy residuals

Losses during extraction
Losses during distribution
Losses during storage
Losses during transformation
Other energy residuals
Total energy residuals

Other residual flows

Residuals from end use for non-energy purposes
Energy from solid waste

5.16 Welcome...

Following the flows

Physical supply and use tables for energy are based on the principle that **the total supply of each flow is equal to the total use of the same flow**: Total supply of energy products equals total use of energy products.

Our starting point is a simple PSUT for energy.

Browse through the slides to see more!

PHYSICAL SUPPLY TABLE FOR ENERGY:

	Agriculture (ISIC A)	Mining (ISIC B)	Manufacturing (ISIC C)	Electricity (ISIC D)	Transportation (ISIC H)	Households	Imports	Flows from environment	Total
Natural inputs									0
Oil resources									0
Energy products									0
Crude oil									0
Petrol									0
Residuals									0
Total	0	0	0	0	0	0	0	0	0

PHYSICAL USE TABLE FOR ENERGY:

	Agriculture (ISIC A)	Mining (ISIC B)	Manufacturing (ISIC C)	Electricity (ISIC D)	Transportation (ISIC H)	Households	Exports	Flows to environment	Total
Natural inputs									0
Oil resources									0
Energy products									0
Crude oil									0
Petrol									0
Residuals									0
Total	0	0	0	0	0	0	0	0	0

Slide 2 (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES 16 / 20 SEEA

Following the flows

Physical supply and use tables for energy are based on the principle that **the total supply of each flow is equal to the total use of the same flow**:
Total supply of energy products equals total use of energy products.

Browse through the slides to see more!

The supply of oil resources from the environment equals the use of these oil resources by the mining industry.

The supply side shows where the energy comes from.
The use side shows where it goes to.

	Agriculture (ISIC A)	Mining (ISIC B)	Manufacturing (ISIC C)	Electricity (ISIC D)	Transportation (ISIC H)	Households	Imports	Flows from environment	Total
Natural inputs Oil resources								100	100
Energy products Crude oil									0
Petrol									0
Residuals									0
Total	0	0	0	0	0	0	0	100	100

	Agriculture (ISIC A)	Mining (ISIC B)	Manufacturing (ISIC C)	Electricity (ISIC D)	Transportation (ISIC H)	Households	Exports	Flows to environment	Total
Natural inputs Oil resources		100							100
Energy products Crude oil									0
Petrol									0
Residuals									0
Total	0	100	0	0	0	0	0	0	200

Slide 3 (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES 16 / 20 SEEA

Following the flows

Physical supply and use tables for energy are based on the principle that **the total supply of each flow is equal to the total use of the same flow**:
Total supply of energy products equals total use of energy products.

Browse through the slides to see more!

The oil resources used by mining is supplied as crude oil and used by manufacturing

Again we see double entry book keeping: from the mining industry on the supply side to manufacturing on the use side.

	Agriculture (ISIC A)	Mining (ISIC B)	Manufacturing (ISIC C)	Electricity (ISIC D)	Transportation (ISIC H)	Households	Imports	Flows from environment	Total
Natural inputs Oil resources								100	100
Energy products Crude oil		100							100
Petrol									0
Residuals									0
Total	0	100	0	0	0	0	0	100	200

	Agriculture (ISIC A)	Mining (ISIC B)	Manufacturing (ISIC C)	Electricity (ISIC D)	Transportation (ISIC H)	Households	Exports	Flows to environment	Total
Natural inputs Oil resources		100							100
Energy products Crude oil			100						100
Petrol									0
Residuals									0
Total	0	100	100	0	0	0	0	0	200

Slide 4 (Slide Layer)

Following the flows

Physical supply and use tables for energy are based on the principle that **the total supply of each flow is equal to the total use of the same flow**: Total supply of energy products equals total use of energy products.

Browse through the slides to see more!

Manufacturing refines crude oil into petrol. The **supply of petrol** is used by transportation, households and exports. Losses during the refining process are recorded as residuals.

According to the double entry system, the residuals are also recorded in the use table as a flow to the environment.

PHYSICAL SUPPLY TABLE FOR ENERGY:

	Agriculture (ISIC A)	Mining (ISIC B)	Manufacturing (ISIC C)	Electricity (ISIC D)	Transportation (ISIC H)	Households	Imports	Flows from environment	Total
Natural inputs									
Oil resources								100	100
Energy products									
Crude oil		100							100
Petrol			92						92
Residuals			8						90
Total	0	100	100	0	0	0	0	100	382

PHYSICAL USE TABLE FOR ENERGY:

	Agriculture (ISIC A)	Mining (ISIC B)	Manufacturing (ISIC C)	Electricity (ISIC D)	Transportation (ISIC H)	Households	Exports	Flows to environment	Total
Natural inputs									
Oil resources		100							100
Energy products									
Crude oil			100						100
Petrol					50	32	10		92
Residuals								8	90
Total	0	100	100	0	50	32	10	90	382

Slide 5 (Slide Layer)

Following the flows

Physical supply and use tables for energy are based on the principle that **the total supply of each flow is equal to the total use of the same flow**: Total supply of energy products equals total use of energy products.

Browse through the slides to see more!

In order to fully balance the table, the **dissipative heat following the combustion of the petrol** is registered as a supply of a residual - and at the same time as a flow to the environment in the use table.

PHYSICAL SUPPLY TABLE FOR ENERGY:

	Agriculture (ISIC A)	Mining (ISIC B)	Manufacturing (ISIC C)	Electricity (ISIC D)	Transportation (ISIC H)	Households	Imports	Flows from environment	Total
Natural inputs									
Oil resources								100	100
Energy products									
Crude oil		100							100
Petrol			92						92
Residuals			8						90
Total	0	100	100	0	0	0	0	100	382

PHYSICAL USE TABLE FOR ENERGY:

	Agriculture (ISIC A)	Mining (ISIC B)	Manufacturing (ISIC C)	Electricity (ISIC D)	Transportation (ISIC H)	Households	Exports	Flows to environment	Total
Natural inputs									
Oil resources		100							100
Energy products									
Crude oil			100						100
Petrol					50	32	10		92
Residuals								8	90
Total	0	100	100	0	50	32	10	90	382

Slide 6 (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES16 / 20SEEA

Following the flows

Physical supply and use tables for energy are based on the principle that **the total supply of each flow is equal to the total use of the same flow**:
Total supply of energy products equals total use of energy products.

Browse through the slides to see more!

The supply equals the use.

Notice the **double counting of the energy content**, caused by the multi-entry recording in the supply and use table.

	Agriculture (ISIC A)	Mining (ISIC B)	Manufacturing (ISIC C)	Electricity (ISIC D)	Transportation (ISIC H)	Households	Imports	Flows from environment	Total
Natural inputs									
Oil resources		100						100	100
Energy products									
Crude oil			92						92
Petrol			8		50	32			90
Residuals									
Total	0	100	100	0	50	32	0	10	382

	Agriculture (ISIC A)	Mining (ISIC B)	Manufacturing (ISIC C)	Electricity (ISIC D)	Transportation (ISIC H)	Households	Exports	Flows to environment	Total
Natural inputs									
Oil resources		100							100
Energy products									
Crude oil			100						100
Petrol					50	32	10		92
Residuals								90	90
Total	0	100	100	0	50	32	10	9	382

5.17 Supply equals use

(Multiple Response, 10 points, 1 attempt permitted)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES17 / 20SEEA

Supply equals use

The supply and use tables are linked by the basic law that **supply is equal to use**. This applies to all kinds of energy regardless of its form - natural inputs, products and residuals. Following this law, how do you record the **production of 100 units of crude oil**?

Check all answers you consider to be correct!

- ☒ Supply of a natural input
- ☒ Use by extraction industry
- ☒ Supply of a product by the extraction industry

OK

Correct	Choice
X	Supply of a natural input
X	Use by extraction industry
X	Supply of a product by the extraction industry

Feedback when correct:

All energy supplied from one unit to another (including between units of a single enterprise) is included in the flow accounts. This includes energy products that are sold, exchanged as part of a barter and provided free of charge.

Please always check that for each row the sums in the supply and the use table are identical!


Feedback when incorrect:

All energy supplied from one unit to another (including between units of a single enterprise) is included in the flow accounts. This includes energy products that are sold, exchanged as part of a barter and provided free of charge.

Please always check that for each row the sums in the supply and the use table are identical!

Very good! (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

17 / 20  SEEA

Supply equals use

The supply and use tables are linked by the basic law that **supply is equal to use**. This applies to all kinds of energy regardless of its form - natural inputs, products and residuals. Following this law, how do you record the **production of 100 units of crude oil**?

Check all answers you consider to be correct!

- ☒ Supply of a natural input
- ☒ Use by extraction industry
- ☒ Supply of a product by the extraction industry

Very good!


All energy supplied from one unit to another (including between units of a single enterprise) is included in the flow accounts. This includes energy products that are sold, exchanged as part of a barter and provided free of charge.

Please always check that for each row the sums in the supply and the use table are identical!

Continue

Not quite right. All answers apply! (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

17 / 20  SEEA

Supply equals use

The supply and use tables are linked by the basic law that **supply is equal to use**. This applies to all kinds of energy regardless of its form - natural inputs, products and residuals. Following this law, how do you record the **production of 100 units of crude oil**?

Check all answers you consider to be correct!

- ☒ Supply of a natural input
- ☒ Use by extraction industry
- ☒ Supply of a product by the extraction industry

Not quite right. All answers apply!


All energy supplied from one unit to another (including between units of a single enterprise) is included in the flow accounts. This includes energy products that are sold, exchanged as part of a barter and provided free of charge.

Please always check that for each row the sums in the supply and the use table are identical!

Continue





5.18 Summary

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

18 / 20  SEEA


Summary

- Flow accounts for energy support a consistent monitoring of supply and use of energy by flow type and industry. They can be compiled using data from energy balances, energy surveys and other sources.
- Together with information on prices, the physical energy flow accounts provide the basis for monetary energy flow accounts.
- Physical supply and use tables (PSUT) for energy provide a comprehensive description of the flows of energy from the capturing of natural inputs, to the supply and use of energy products within the economy and the return of residuals to the environment.
- PSUT should be compiled in a common energy unit in order to make aggregations possible. The SEEA-Energy uses the joule, which is consistent with the International Recommendations for Energy Statistics (IRES).
- The level of product and industry detail used in the PSUT will depend on the requirements of data users and on data availability.
- PSUT for energy are based on the principle that the total supply of each flow is equal to the total use of the same flow. The supply side shows where the energy comes from, the use side where it goes to. Total supply of energy products equals total use of energy products.







Explanation 1 (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES

18 / 20  SEEA

Summary

- Flow accounts for energy support a consistent monitoring of supply and use of energy by flow type and industry. They can be compiled using data from energy balances, energy surveys and other sources.
- Together with information on **Aquastat is FAO's global water information system, developed by the Land and Water Division.** accounts provide the basis for monetary energy flow accounts.
- Physical supply and use tables (PSUT) for energy provide a comprehensive description of the flows of energy from the capturing of natural inputs, to the supply and use of energy products within the economy and the return of residuals to the environment.
- PSUT should be compiled in a common energy unit in order to make aggregations possible. The SEEA-Energy uses the joule, which is consistent with the International Recommendations for Energy Statistics (IRES).
- The level of product and industry detail used in the PSUT will depend on the requirements of data users and on data availability.
- PSUT for energy are based on the principle that the total supply of each flow is equal to the total use of the same flow. The supply side shows where the energy comes from, the use side where it goes to. Total supply of energy products equals total use of energy products.



Explanation 2 (Slide Layer)

MODULE 3: PHYSICAL SUPPLY AND USE TABLES





18 / 20 SEEA

Summary

- Flow accounts for energy support a consistent monitoring of supply and use of energy by flow type and industry. They can be compiled using data from energy balances, energy surveys and other sources.
- Together with information on prices, the physical energy flow accounts provide the basis for monetary energy flow accounts.
- Physical supply and use tables (PSUT) for energy provide a comprehensive description of the flows of energy from the capturing of natural inputs, to the supply and use of energy products within the economy and the return of residuals to the environment.
- PSUT should be compiled in a common energy unit in order to make aggregations possible. The SEEA-Energy uses the joule, which is consistent with the International Recommendations for Energy Statistics (IRES).
- The level of product and industry detail used in the PSUT will depend on the requirements of data users and on data availability.

WCDMP is a sub-program of the World Climate Programme (WCP), and provides international coordination of the WMO Climate System Monitoring.

each flow is equal to the total use of the same flow. The supply side shows where the energy comes from, the use side where it goes to. Total supply of energy products equals total use of energy products.



Explanation 3 (Slide Layer)





MODULE 3: PHYSICAL SUPPLY AND USE TABLES

18 / 20 SEEA

Summary

- Flow accounts for energy support a consistent monitoring of supply and use of energy by flow type and industry. They can be compiled using data from energy balances, energy surveys and other sources.
- Together with information on prices, the physical energy flow accounts provide the basis for monetary energy flow accounts.
- Physical supply and use tables (PSUT) for energy provide a comprehensive description of the flows of energy from the capturing of natural inputs, to the supply and use of energy products within the economy and the return of residuals to the environment.
- PSUT should be compiled in a common energy unit in order to make aggregations possible. The SEEA-Energy uses the joule, which is consistent with the International Recommendations for Energy Statistics (IRES).
- The level of product and industry detail used in the PSUT will depend on the requirements of data users and on data availability.

WHYCOS is a framework programme from the World Meteorological Organization. It's dedicated to improving basic observation activities, strengthening international cooperation and promoting the free exchange of data in the hydrology field.



5.19 Where can you find more information?

MODULE 3: PHYSICAL SUPPLY AND UNSE TABLES 19 / 20 SEEA

Where can you find more information?

UN: SEEA-Energy website
seea.un.org/seea-energy

UN: SEEA-Energy Manual
https://seea.un.org/sites/seea.un.org/files/documents/seea-energy_final_web.pdf

UN: International Recommendations for Energy Statistics
<http://unstats.un.org/unsd/energy/ires/>

Eurostat: Physical Energy Flow Accounts
<http://ec.europa.eu/eurostat/web/environment/methodology>

5.20 Last page

MODULE 3: PHYSICAL SUPPLY AND UNSE TABLES 20 / 20 SEEA


Last page

This is the last screen in Module 3 of the in-depth training on energy statistics.

We hope that, after this introduction, you're now feeling prepared to commence with

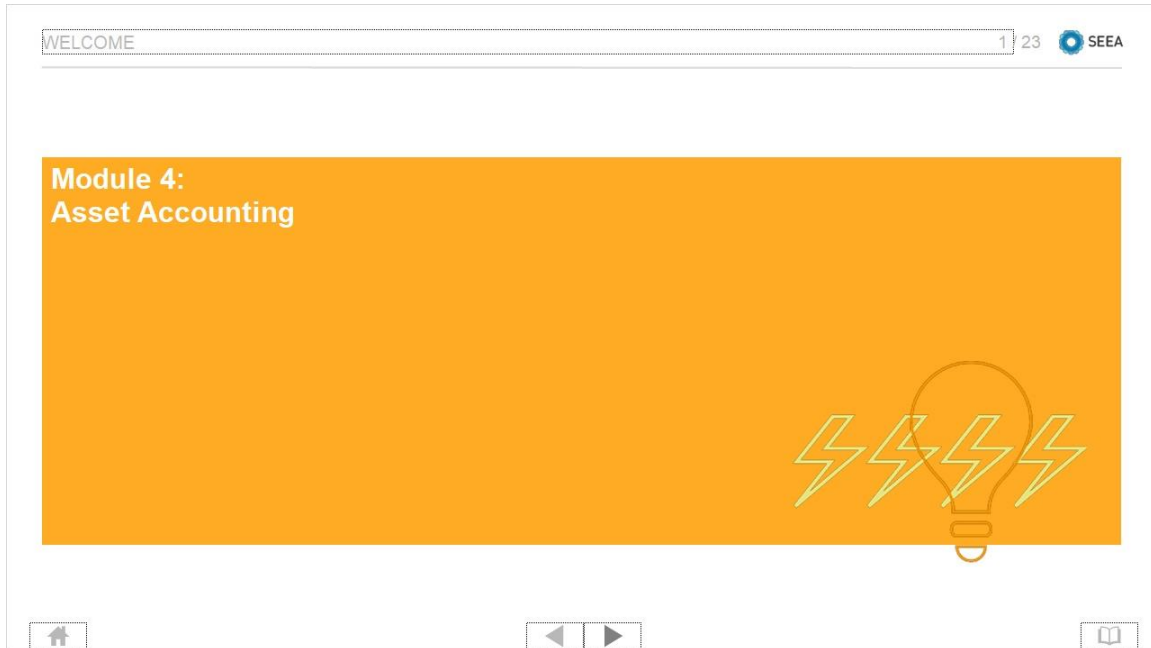
Module 4: Asset accounting

Thanks for learning!



6. Module 4 - Asset accounting

6.1 Welcome



Notes:

6.2 Welcome...

MODULE 4: ASSET ACCOUNTING

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Welcome...


... to **Module 4: Asset accounting!**

This module discusses accounting for energy resources and products and describes the relevant categorization of these inputs according to their physical characteristics and criteria related to the extraction of these inputs. The topics covered are:

- Physical assets in SEEA and SNA
- Scope of the physical asset accounts
- Classes of viability
- Categorization of quantity and quality
- Quantification of stocks of energy resources
- Inventories of energy products
- Valuation and the NPV approach

We appreciate your interest in accounting for energy.

Thanks for learning!



6.3 Physical asset accounts for energy


MODULE 4: ASSET ACCOUNTING

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Physical asset accounts for energy

There has been increasing awareness of the value inherent in the **components that comprise the environment** and the inputs the environment provides to society. The term environmental asset has been used to denote the source of these inputs:

- Asset accounts for energy resources organize relevant information including the **levels and values of stocks of the natural inputs** and the changes in these stocks over time.
- Extractions reducing resources and additions to resources via new discoveries** are central to the asset accounts, providing valuable information about energy resources that an economy relies upon.
- The amount of energy resources held and, over time, the type and extent of changes to these levels, provide an indication of **future requirements for energy imports**, and threats to national energy security.



6.4 Defining assets

(Multiple Response, 10 points, 1 attempt permitted)

MODULE 4: ASSET ACCOUNTING

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Defining assets

Assets such as energy resources are items that are considered to be of value to society. Asset accounts for energy resources increase the knowledge of policymakers to determine the **likely operating life of existing resources** and what steps are needed to enhance energy security. SEEA-Energy focuses on those environmental assets that are primarily used as energy sources. Based on this, can you imagine which assets are the focus of the asset accounts in SEEA-Energy?

Check all answers you consider to be correct!

☒ Oil resources

☒ Natural gas resources





☒ Coal and peat resources

☒ Uranium and other nuclear fuels

☐ Wood in forests

☐ Renewables (wind, solar, hydropower, etc.)

OK



Correct	Choice
X	Oil resources
X	Natural gas resources
X	Coal and peat resources
X	Uranium and other nuclear fuels
	Wood in forests
	Renewables (wind, solar, hydropower, etc.)

Feedback when correct:

While firewood in forests and other stocks of biomass in nature can be used for energy purposes, no energy asset accounts are compiled for such wood because, overall, these assets are not

primarily used for energy purposes. Asset accounts for timber are discussed in SEEA CF and SEEA Agriculture, Forestry and Fisheries.

Renewable sources of energy are not considered physical assets in SEEA-Energy. With the exemption

of biomass, renewable sources of energy cannot be exhausted, in contrast to mineral and energy resources. Thus in an accounting sense there is no physical stock of these types of renewable sources of energy that can be used up or sold.

Feedback when incorrect:

While firewood in forests and other stocks of biomass in nature can be used for energy purposes, no energy asset accounts are compiled for such wood because, overall, these assets are not primarily used for energy purposes. Asset accounts for timber are discussed in SEEA CF and SEEA Agriculture, Forestry and Fisheries.

Renewable sources of energy are not considered physical assets in SEEA-Energy. With the exemption

of biomass, renewable sources of energy cannot be exhausted, in contrast to mineral and energy resources. Thus in an accounting sense there is no physical stock of these types of renewable sources of energy that can be used up or sold.

Very good! (Slide Layer)

MODULE 4: ASSET ACCOUNTING

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Defining assets

Assets such as energy resources are items that are considered to be of value to society. Asset accounts for energy resources increase the knowledge of policymakers to determine the **likely of existing resources** and what steps are needed to enhance energy security. SEEA-Energy those environmental assets that are primarily used as energy sources. Based on this, can which assets are the focus of the asset accounts in SEEA-Energy?

Check all answers you consider to be correct!

- ☒ Oil resources
- ☒ Natural gas resources
- ☒ Coal and peat resources
- ☒ Uranium and other nuclear fuels
- ☐ Wood in forests
- ☐ Renewables (wind, solar, hydropower, etc.)

Very good!

- While firewood in forests and other stocks of biomass in nature can be used for energy purposes, **no energy asset accounts are compiled** for such wood because, overall, **these assets are not primarily used for energy purposes**. Asset accounts for timber are discussed in SEEA CF and SEEA Agriculture, Forestry and Fisheries.
- Renewable sources of energy are not considered physical assets in SEEA-Energy. With the exemption of biomass, **renewable sources of energy cannot be exhausted**, in contrast to mineral and energy resources. Thus in an accounting sense there is no physical stock of these types of renewable sources of energy that can be used up or sold.

Continue

Not quite right. Take a look at the solution! (Slide Layer)

MODULE 4: ASSET ACCOUNTING

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Defining assets

Assets such as energy resources are items that are considered to be of value to society. Asset accounts for energy resources increase the knowledge of policymakers to determine the **likely of existing resources** and what steps are needed to enhance energy security. SEEA-Energy those environmental assets that are primarily used as energy sources. Based on this, can which assets are the focus of the asset accounts in SEEA-Energy?

Check all answers you consider to be correct!

- ☒ Oil resources
- ☒ Natural gas resources
- ☒ Coal and peat resources
- ☒ Uranium and other nuclear fuels
- ☐ Wood in forests
- ☐ Renewables (wind, solar, hydropower, etc.)

Not quite right. Take a look at the solution!

- While firewood in forests and other stocks of biomass in nature can be used for energy purposes, **no energy asset accounts are compiled** for such wood because, overall, **these assets are not primarily used for energy purposes**. Asset accounts for timber are discussed in SEEA CF and SEEA Agriculture, Forestry and Fisheries.
- Renewable sources of energy are not considered physical assets in SEEA-Energy. With the exemption of biomass, **renewable sources of energy cannot be exhausted**, in contrast to mineral and energy resources. Thus in an accounting sense there is no physical stock of these types of renewable sources of energy that can be used up or sold.

Continue

6.5 Scope of the physical asset accounts

MODULE 4: ASSET ACCOUNTING 5 / 23 SEEA

Scope of the physical asset accounts

SEEA-Energy includes all assets of energy resources that **may provide benefits to humanity**, although they may not have any present market value:

- In principle this means **all known deposits of energy resources**.
- For the physical asset accounts this means that the scope is broadened compared to the national accounts, SNA, which only includes the **commercially exploitable resources**, which can be associated with a positive market value.
- Note that the definition of a mineral and energy resource in the SEEA-Energy is necessarily narrower than that in the SEEA Central Framework (SEEA CF). SEEA-Energy includes only those resources that **relate to energy**, while in SEEA CF the definition is broader and includes other non-metallic and metallic minerals (e.g. iron).

SEEA CF
All known deposits:
• Oil
• Natural gas
• Coal and peat
• Non-metallic minerals
• Metallic minerals

SEEA-Energy
All known deposits:
• Oil
• Natural gas
• Coal and peat
• Uranium and other nuclear fuels

SNA
Commercially exploitable given current technology and relative prices

6.6 UNFC: Categorization of energy resources

MODULE 4: ASSET ACCOUNTING 6 / 23 SEEA

UNFC: Categorization of energy resources

The United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009) categorizes mineral and energy resources by looking at whether, and to what extent, **projects for the extraction or exploration of the resources have been confirmed, developed or planned**.

The UNFC-2009 is based on a breakdown of the resources according to three criteria affecting their extraction:

Click on the headlines to find out more!

- Economic and social viability (E)
- Field project status and feasibility (F)
- Geological knowledge (G)

6.7 Combined classifications of known ...

MODULE 4: ASSET ACCOUNTING 7 / 23 SEEA

Combined classifications of known mineral and energy resources

Based on where a deposit is classified in E, F and G after the UNFC-2009, determines whether it is in classes A, B or C of the SEEA. Note that in order to ensure a broader understanding of stocks, the scope of known deposits in SEEA-Energy is broader than the scope that underpins the measurement of energy resources in the SNA, which is limited to deposits that are commercially exploitable given current technology and relative prices.

Click on the empty fields to find out more!

	Economic and social viability (E)	Field project status and feasibility (F)	Geological knowledge (G)
SEEA Class A: Commercially Recoverable Resources			
SEEA Class B: Potentially Commercially Recoverable Resources			
SEEA Class C: Non-Commercial and Other Known Deposits			

6.8 Quantification of stocks of energy resources

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Quantification of stocks of energy resources

When quantifying energy resources care should be taken **not to double-count quantities and to research the basis on which the data are recorded** - and where necessary and possible to adjust the basic input data. This ensures consistent recording within both the asset and flow accounts for energy, e.g. consistent treatment of flaring of natural gas, own use of energy, differentiation between non-produced and produced assets and extraction losses.

Click on the fields to find examples!

6.9 Stocks of mineral and energy resources (physical units)

Stocks of energy resources (physical units)

This table illustrates stocks of known energy resources by class:

Type of mineral and energy resource	Class of known deposit		
	Class A: Commercially recoverable resources	Class B: Potentially commercially recoverable resources	Class C: Non-commercial and other known deposits
Oil resources ('000 barrels)	800	600	400
Natural gas resources (m3)	1 200	1 000	1 500
Coal & peat resources ('000 tonnes)	600	50	50
Uranium and other nuclear fuels (tonnes)			

- Opening and closing stocks of each resource should be **classified as A, B or C**.
- The statement relates to a **certain point of time**. A statement of the opening stock would, for instance, refer to 1 January. A statement of the closing stock would typically refer to 31 December.
- **Different physical units are used for different types of energy resources**, and no totals for all energy resources are presented because of the different units used.
- It is also not recommended to compile totals across all classes of individual types of resources, because **each class has a different likelihood of extraction**, and simple summation may give a misleading indication of total available resources.

6.10 The SEEA Central Framework

Mineral and energy resource account (physical units)

Energy resources in nature are **discovered and extracted**. The asset account records the stocks of relevant energy resources at the beginning and the end of a period and all changes in the stocks during the period.

Explore the highlighted areas to find out more!

Type of mineral and energy resource (Class A: Commercially recoverable resources)	
Oil resources ('000 barrels)	Natural gas resources (m3)
Opening stock of mineral and energy resources	
Additions to stock	
Discoveries	
Upwards reappraisals	
Reclassifications	
Total additions to stock	
Reductions in stock	
Extractions	
Catastrophic losses	
Downwards reappraisals	
Reclassifications	
Total reductions in stock	
Closing stock of mineral and energy resources	

Reclassifications may occur if certain deposits are opened or closed to extraction. The asset account "explains" the development of the stock from the beginning to the end of the period. The "explanation" is given by the basic identity that the closing stock is always equal to the opening stock plus changes during the period. This basic identity must always be fulfilled for all energy resources.

6.11 Reappraisals of natural energy resources

(Multiple Response, 10 points, 1 attempt permitted)

MODULE 4: ASSET ACCOUNTING

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Reappraisals of natural energy resources

Reappraisals are typically associated with a **move of resources between the classes A, B and C**. They may be upwards or downwards. Do you know the reasons that underlay these changes?

Check all answers you consider to be correct!

- ☒ Reappraisals reflect changes in the categorization of specific deposits based on changes in geological information or technology.
- ☒ Reappraisals relate to either additions or reductions in the estimated available stock of a specific deposit.
- ☒ A common reason for upward reappraisals of the quantity of energy resources is price increases.

OK



Correct	Choice
X	Reappraisals reflect changes in the categorization of specific deposits based on changes in geological information or technology.
X	Reappraisals relate to either additions or reductions in the estimated available stock of a specific deposit.
X	A common reason for upward reappraisals of the quantity of energy resources is price increases.

Feedback when correct:

Reappraisals pertain to the estimated available stock of a specific deposit and occur with changes in the geological information, technology or prices.

When energy prices go up it becomes more profitable to extract resources, so an upward reappraisal of the physical quantities may take place. In contrast downward reappraisals of the quantities may take place when energy prices are going down.


Feedback when incorrect:

Reappraisals pertain to the estimated available stock of a specific deposit and occur with changes in the geological information, technology or prices.

When energy prices go up it becomes more profitable to extract resources, so an upward reappraisal of the physical quantities may take place. In contrast downward reappraisals of the quantities may take place when energy prices are going down.

Very good! (Slide Layer)

MODULE 4: ASSET ACCOUNTING

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Reappraisals of natural energy resources

Reappraisals are typically associated with a **move of resources between the classes A, B and C**. They may be upwards or downwards. Do you know the reasons that underlay these changes?

Check all answers you consider to be correct!

- ☒ Reappraisals reflect changes in the categorization of specific deposits based on changes in geological information or technology.
- ☒ Reappraisals relate to either additions or reductions in the estimated available stock of a specific deposit.
- ☒ A common reason for upward reappraisals of the quantity of energy resources is price increases.

Very good!

Reappraisals pertain to the estimated available stock of a specific deposit and occur with **changes in the geological information, technology or prices**.

When energy prices go up it becomes more profitable to extract resources, so an upward reappraisal of the physical quantities may take place. In contrast downward reappraisals of the quantities may take place when energy prices are going down.

[Continue](#)

Not quite right. All answers are correct! (Slide Layer)

MODULE 4: ASSET ACCOUNTING

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Reappraisals of natural energy resources

Reappraisals are typically associated with a **move of resources between the classes A, B and C**. They may be upwards or downwards. Do you know the reasons that underlay these changes?

Check all answers you consider to be correct!

- ☒ Reappraisals reflect changes in the categorization of specific deposits based on changes in geological information or technology.
- ☒ Reappraisals relate to either additions or reductions in the estimated available stock of a specific deposit.
- ☒ A common reason for upward reappraisals of the quantity of energy resources is price increases.

Not quite right. All answers are correct!

Reappraisals pertain to the estimated available stock of a specific deposit and occur with **changes in the geological information, technology or prices**.

When energy prices go up it becomes more profitable to extract resources, so an upward reappraisal of the physical quantities may take place. In contrast downward reappraisals of the quantities may take place when energy prices are going down.

Continue

6.12 Inventories of energy products


MODULE 4: ASSET ACCOUNTING





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Inventories of energy products

In addition to accumulated quantities of mineral and energy resources, governments and enterprises in a country will often hold **accumulated quantities of coal, oil and other energy products**, either for reasons of national security, self-sufficiency or for purely commercial reasons:

- Using terminology consistent with the national accounts, these **physical accumulations of energy products are called inventories** in SEEA-Energy, while the term **stocks** is used to designate any point-in-time accumulation within the economy, whether they are mineral and energy resources or energy products.
- Besides having an analytical interest in their own right, the **asset accounts for inventories can be instrumental within the physical supply and use tables for energy products** since full asset accounts for inventories of energy products can be used to corroborate the data.





6.13 SEEA: Classes of viability

(Drag and Drop, 10 points, 1 attempt permitted)

MODULE 4: ASSET ACCOUNTING

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Classifications for inventories of energy products

An asset account for inventories should be set up for each important energy product. As mentioned in the previous section, it is important to use the same classification of the energy products as is used for the general supply and use tables. Can you sort them out?

Drag the items to the corresponding categories!

Stocks of energy resources

Primary energy products

Stocks of energy products

Secondary energy products





Coal, crude oil and natural gas, etc.

Town gas, fuel oil, gasoline, diesel, etc.

Inventories

Deposits of coal underground

OK



Drag Item	Drop Target
Deposits of coal underground	Target 1
Inventories	Target 2
Coal, crude oil and natural gas, etc.	Target 3
Town gas, fuel oil, gasoline, diesel, etc.	Target 4

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)

Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:

In SEEA-Energy and the SNA stocks of energy products are called inventories.

The range of energy products includes primary energy products which are being accumulated after extraction and before processing takes place, as well as secondary energy products which are the result of further processing.

Due to the non-material characteristics of electricity and heat, it is not possible to put these energy products into inventories and thus asset accounts are not applicable for electricity and heat.

Feedback when incorrect:

In SEEA-Energy and the SNA stocks of energy products are called inventories.

The range of energy products includes primary energy products which are being accumulated after extraction and before processing takes place, as well as secondary energy products which are the result of further processing.

Due to the non-material characteristics of electricity and heat, it is not possible to put these energy products into inventories and thus asset accounts are not applicable for electricity and heat.

Correct (Slide Layer)

MODULE 4: ASSET ACCOUNTING

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Classifications for inventories of energy products

An asset account for inventories should be set up for each important energy product. As mentioned in the previous section, it is important to use the same classification of the products as is used for the general supply and use tables. Can you sort them out?

Drag the items to the corresponding categories!

Stocks of energy resources		Primary energy products	
Stocks of energy products		Secondary energy products	

Very good!

- In SEEA-Energy and the SNA stocks of energy products are called inventories.
- The range of energy products includes **primary energy products which are being accumulated after extraction and before processing takes place**, as well as **secondary energy products which are the result of further processing**.
- Due to the non-material characteristics of electricity and heat, it is not possible to put these energy products into inventories and thus **asset accounts are not applicable for electricity and heat**.

Continue

Incorrect (Slide Layer)

MODULE 4: ASSET ACCOUNTING

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Classifications for inventories of energy products

An asset account for inventories should be set up for each important energy product. As mentioned in the previous section, it is important to use the same classification of the products as is used for the general supply and use tables. Can you sort them out?

Drag the items to the corresponding categories!

Stocks of energy resources	Deposits of energy resources	Primary energy products	Coal, crude oil and natural gas, etc.
Stocks of energy products	Inventories	Secondary energy products	Town gas, fuel oil, gasoline, diesel, etc.

Not quite right. Take a look at the solution!

- In SEEA-Energy and the SNA stocks of energy products are called inventories.
- The range of energy products includes **primary energy products which are being accumulated after extraction and before processing takes place**, as well as **secondary energy products which are the result of further processing**.
- Due to the non-material characteristics of electricity and heat, it is not possible to put these energy products into inventories and thus **asset accounts are not applicable for electricity and heat**.

Continue

6.14 Physical asset accounts for inventories of energy products

MODULE 4: ASSET ACCOUNTING 14 / 23 SEEA

Physical asset accounts for inventories of energy products

Energy products in inventories are **added or withdrawn from inventories**, for instance, when the **products are bought or sold**. An asset account for inventories of energy products includes the same items as the asset accounts for energy resources: Opening stock, changes and closing stock.

Explore the highlighted areas to find out more!

Units different for different subcategories

6.15 Physical asset accounts for resources and products

(Drag and Drop, 10 points, 1 attempt permitted)

MODULE 4: ASSET ACCOUNTING 15 / 23 SEEA

Physical asset accounts for resources and products

The information from both of the asset accounts is useful for **analysis of national security, self-sufficiency or the commercial conditions within the energy sector**. Can you sort out what each type of accounts can specifically inform about?

Drag the items to the corresponding categories!

...show how much energy is stored in the economy and how the inventories have developed.

...show how many energy resources a country owns and to which extent these are available for economic use via extraction.

Asset accounts for inventories of energy products

Physical asset accounts for energy resources

OK

Drag Item	Drop Target
Asset accounts for inventories of energy products	Target 1
Physical asset accounts for energy resources	Target 2

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:

Physical asset accounts for energy resources also show how the stocks have developed over time, and how the development has been affected by the economic activities, for instance, how much has been extracted and how much has been added to the available stocks by new discoveries.

While the physical asset accounts themselves are important for analysis, they are at the same time a first necessary step towards the construction of monetary asset accounts.


Feedback when incorrect:

Physical asset accounts for energy resources also show how the stocks have developed over time, and how the development has been affected by the economic activities, for instance, how much has been extracted and how much has been added to the available stocks by new discoveries.

While the physical asset accounts themselves are important for analysis, they are at the same time a first necessary step towards the construction of monetary asset accounts.

Correct (Slide Layer)

MODULE 4: ASSET ACCOUNTING

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Physical asset accounts for resources and products

The information from both of the asset accounts is useful for **analysis of national security, self-sufficiency or the commercial conditions within the energy sector**. Can you sort each type of accounts can specifically inform about?

Drag the items to the corresponding categories!

...show how much energy is stored in the economy and how the inventories have developed.

...show how many energy resources a country owns and to which extent these are available for economic use via extraction.

Asset & inventory products

Very good!

Physical asset accounts for energy resources also show how the stocks have developed over time, and how the development has been affected by the economic activities, for instance, how much has been extracted and how much has been added to the available stocks by new discoveries.

While the physical asset accounts themselves are important for analysis, they are at the same time a first necessary step towards the construction of monetary asset accounts.

Continue

Incorrect (Slide Layer)

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Physical asset accounts for resources and products

The information from both of the asset accounts is useful for analysis of national security, self-sufficiency or the commercial conditions within the energy sector. Can you sort each type of accounts can specifically inform about?

Drag the items to the corresponding categories!

Asset accounts for inventories of energy products
... show how much energy is stored in the economy and how the inventories have developed.

Physical asset accounts for energy resources
... show how many energy resources a country owns and to which extent these are available for economic use via extraction.

Not quite right. Take a look at the solution!

Physical asset accounts for energy resources also show how the stocks have developed over time, and how the development has been affected by the economic activities, for instance, how much has been extracted and how much has been added to the available stocks by new discoveries.

While the physical asset accounts themselves are important for analysis, they are at the same time a first necessary step towards the construction of monetary asset accounts.

Continue

6.16 Monetary asset accounts

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Monetary asset accounts

Monetary asset accounts for energy resources provide a *market based valuation* of the physical stocks of mineral and energy resources and the changes in the value of these stocks over time. As illustrated here, it may be set up for any individual mineral and energy resource of interest (e.g. for crude oil, natural gas, coal, etc.) and are usually compiled for resources in class A:


- The definitions of the flows presented in the monetary accounts **align exactly with the corresponding physical flows**. Thus, the monetary account reflects a **valuation of physical flows** as recorded in the physical asset account.
- All entries should be made in the **same currency unit**, and prices should be expressed in current prices.
- The only additional flow recorded in the monetary asset account compared to the physical asset account concerns **revaluations, which are related to the effect of price changes on the value of the existing stock** and reflect the nominal holding gains and losses.

Type of mineral and energy resource (Class A: Commercially recoverable resources) (000's currency units)	
Opening value of stock of resources	
Additions to value of stock	
Discoveries	
Upwards reappraisals	
Reclassifications	
Total additions to stock	
Reductions in value of stock	
Extractions	
Catastrophic losses	
Downwards reappraisals	
Reclassifications	
Total reductions in stock	
Revaluations	
Closing value of stock of resources	

6.17 Valuation of stocks of mineral and energy resources

(Multiple Response, 10 points, 1 attempt permitted)

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Valuation of stocks of mineral and energy resources

Monetary asset accounts for energy resources provide a **market based valuation** of the physical stocks of mineral and energy resources and the changes in the value of these stocks over time. Can you imagine what they are used for?

Check all answers you consider to be correct!

- ☒ Different resources can be compared using a common numéraire.
- ☒ Mineral and energy resources can be compared with other assets in order to assess relative returns, national wealth, and other similar types of analyses.
- ☒ Valuation of resources in monetary terms may be a useful approach to assessing future streams of income for government.

OK



Correct	Choice
X	Different resources can be compared using a common numéraire.
X	Mineral and energy resources can be compared with other assets in order to assess relative returns, national wealth, and other similar types of analyses.
X	Valuation of resources in monetary terms may be a useful approach to assessing future streams of income for government.

Feedback when correct:

It is also the case that in business accounts, enterprises involved in extraction make assessments in terms of their future income streams and it is useful to be able to place these individual enterprise based valuations into a broader, national perspective.

There is also increasing use of market based mechanisms, such as quotas, to allocate access rights to environmental assets. These mechanisms may relate directly to aggregate valuations for mineral and energy resources.


Feedback when incorrect:

It is also the case that in business accounts, enterprises involved in extraction make assessments in terms of their future income streams and it is useful to be able to place these individual enterprise based valuations into a broader, national perspective.

There is also increasing use of market based mechanisms, such as quotas, to allocate access rights to environmental assets. These mechanisms may relate directly to aggregate valuations for mineral and energy resources.

Very good! (Slide Layer)

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Valuation of stocks of mineral and energy resources

Monetary asset accounts for energy resources provide a **market based valuation** of the physical stocks of mineral and energy resources and the changes in the value of these stocks over time. Can you imagine what they are used for?

Check all answers you consider to be correct!

- ☒ Different resources can be compared using a common numéraire.
- ☒ Mineral and energy resources can be compared with other assets in order to assess relative returns, national wealth, and other similar types of analyses.
- ☒ Valuation of resources in monetary terms may be a useful approach to assessing future streams of income for government.

Very good!


It is also the case that in business accounts, enterprises involved in extraction make assessments in terms of their future income streams and it is useful to be able to place these individual enterprise based valuations into a broader, national perspective.

There is also increasing use of market based mechanisms, such as quotas, to allocate access rights to environmental assets. These mechanisms may relate directly to aggregate valuations for mineral and energy resources.

[Continue](#)

Not quite right. All answers are correct! (Slide Layer)

MODULE 4: ASSET ACCOUNTING

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Valuation of stocks of mineral and energy resources

Monetary asset accounts for energy resources provide a **market based valuation** of the physical stocks of mineral and energy resources and the changes in the value of these stocks over time. Can you imagine what they are used for?

Check all answers you consider to be correct!

- ☒ Different resources can be compared using a common numéraire.
- ☒ Mineral and energy resources can be compared with other assets in order to assess relative returns, national wealth, and other similar types of analyses.
- ☒ Valuation of resources in monetary terms may be a useful approach to assessing future streams of income for government.

Not quite right. All answers are correct!


It is also the case that in business accounts, enterprises involved in extraction make assessments in terms of their future income streams and it is useful to be able to place these individual enterprise based valuations into a broader, national perspective.

There is also increasing use of market based mechanisms, such as quotas, to allocate access rights to environmental assets. These mechanisms may relate directly to aggregate valuations for mineral and energy resources.

Continue

6.18 Monetary asset accounts

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Valuation of stocks of mineral and energy resources

If the energy resources in the ground (i.e. before extraction) are bought and sold in the market, the observable **market values** should be used for the valuation of the resource.

However, although prices of the output from extraction of an energy resource can be found, often no market transactions of the resource itself take place, and as a rule **market values of the energy resources can not be observed**.

Various methods for the estimation of proxies for market values of energy resources exist, but the recommended method is the so-called **net present value**.





6.19 Monetary asset accounts

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The net present value (NPV)

- This approach is based on the assumption that the market value is equal to the sum of **expected future earnings (resource rent)** from the use of the resource.
- But: Future earnings are assumed to be of **less value today** than earnings accruing presently.
- Therefore future earnings have to be **multiplied by a discount factor** to estimate the present value of the future earnings.

For details on the general NPV approach including potential uses and limitations see SEEA-Energy and SEEA CF Chapter 5.

Year of extraction	Physical extraction Million m ³	Unit resource rent, current prices	Resource rent, current prices	Discount factor (6 percent)	Discounted resource rents
t	37	2 148	79 476	0,94	74 977
t+1	37	2 212	81 860	0,89	72 855
t+2	41	2 279	93 431	0,84	78 447
t+3	41	2 347	96 234	0,79	76 227
t+4	41	2 418	99 121	0,75	74 069
t+5	41	2 490	102 095	0,70	71 973
...

Discount factor (6 percent)
= $1/(1+0.06)^t$

Discounted resource rents
= Resource rents multiplied by the discount factor

6.20 Steps of the NPV approach

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Steps of the NPV approach

The NPV for stocks of energy resources is based on estimates of future physical extractions. If such **future extraction profiles** are available from energy agencies or geological institutes, they should be used. If such data are not available, compilers should assume that extractions will **continue at the current level until the resource is exhausted**.


Click on the fields to see the next steps!

- 1
- 2
- 3
- 4
- 5

Future extraction profiles for an energy resource





6.21 Summary

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Summary

- All known deposits of energy resources are in scope, also asset accounts for inventories of energy products can be set up, while renewable sources such as sun and wind are excluded.
- The SEEA-Energy classifies energy resources based on the UNFC-2009 categorization that look at the quantity and quality of the underground deposit, as this will influence the likelihood and cost of extraction and the degree of confidence with regard to the quantity that can be extracted in the future.
- An asset account shows opening and closing stocks and changes in the period. The basic identity (Opening stock + Changes = Closing stock) must always be fulfilled.
- The changes between opening and closing stocks includes various additions and deductions from stocks caused by economic activities, but also factors like catastrophes.
- The physical asset accounts are important for assessing how much of a resource a country owns, and for various other analysis of the economy, and are also a first step towards the construction of monetary asset accounts.
- The definitions of the flows presented in the monetary accounts align exactly with the corresponding physical flows. Thus, the monetary account reflects a valuation of physical flows as recorded in the physical asset account.
- The recommended method for the estimation of proxies for market values of energy resources is the net present value method. It is based on the assumption that the market value is equal to the sum of expected future earnings (resource rent) from the use of the resource.







Explanation 1 (Slide Layer)

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Summary

- All known deposits of energy resources are in scope, also asset accounts for inventories of energy products can be set up, while renewable sources such as sun and wind are excluded.
- The SEEA-Energy classifies energy resources based on the UNFC-2009 categorization that look at the quantity and quality of the underground deposit, as this will influence the likelihood and cost of extraction and the degree of confidence with regard to the quantity that can be extracted in the future.
- An asset account shows opening and closing stocks and changes in the period. The basic identity (Opening stock + Changes = Closing stock) must always be fulfilled.
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- The physical asset accounts are important for assessing how much of a resource a country owns, and for various other analysis of the economy, and are also a first step towards the construction of monetary asset accounts.
- The definitions of the flows presented in the monetary accounts align exactly with the corresponding physical flows. Thus, the monetary account reflects a valuation of physical flows as recorded in the physical asset account.
- The recommended method for the estimation of proxies for market values of energy resources is the net present value method. It is based on the assumption that the market value is equal to the sum of expected future earnings (resource rent) from the use of the resource.







Explanation 2 (Slide Layer)

MODULE 4: ASSET ACCOUNTING

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Summary

- All known deposits of energy resources are in scope, also asset accounts for inventories of energy products can be set up, while renewable sources such as sun and wind are excluded.
- The SEEA-Energy classifies energy resources based on the UNFC-2009 categorization that look at the quantity and quality of the underground deposit, as this will influence the likelihood and cost of extraction and the degree of confidence with regard to the quantity that can be extracted in the future.
- An asset account shows opening and closing stocks and changes in the period. The basic identity (Opening stock + Changes = Closing stock) must always be fulfilled.
- The changes between opening and closing stocks includes various additions and deductions from stocks caused by economic activities, but also factors like catastrophes.
- The physical asset accounts are important for assessing how much of a resource a country owns, and for various other analysis of the economy, and are also a first step towards the construction of monetary asset accounts.
- The definitions of the flows presented in the monetary accounts **WCDMP is a sub-program of the World Climate Programme (WCP), and provides international coordination of the WMO Climate System Monitoring.**
- The recommended method for the estimation of proxies for market values of energy resources is the net present value method. It is based on the assumption that the market value is equal to the sum of expected future earnings (resource rent) from the use of the resource.







Explanation 3 (Slide Layer)

MODULE 4: ASSET ACCOUNTING

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Summary

- All known deposits of energy resources are in scope, also asset accounts for inventories of energy products can be set up, while renewable sources such as sun and wind are excluded.
- The SEEA-Energy classifies energy resources based on the UNFC-2009 categorization that look at the quantity and quality of the underground deposit, as this will influence the likelihood and cost of extraction and the degree of confidence with regard to the quantity that can be extracted in the future.
- An asset account shows opening and closing stocks and changes in the period. The basic identity (Opening stock + Changes = Closing stock) must always be fulfilled.
- The changes between opening and closing stocks includes various additions and deductions from stocks caused by economic activities, but also factors like catastrophes.
- The physical asset accounts are important for assessing how much of a resource a country owns, and for various other analysis of the economy, and are also a first step towards the construction of monetary asset accounts.
- The definitions of the flows presented in the monetary accounts align exactly with the corresponding physical flows. Thus, the monetary account reflects a valuation of physical flows as recorded **WHYCOS is a framework programme from the World Meteorological Organization. It's dedicated to improving basic observation activities, strengthening international cooperation and promoting the free exchange of data in the hydrology field.**
- based on the assumption that the market value is equal to the sum of expected future earnings (resource rent) from the use of the resource.



6.22 Where can you find more information?





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Where can you find more information?

Chapters 5 and 6 in SEEA-Energy describes in more detail what has been presented in this module
https://seea.un.org/sites/seea.un.org/files/documents/seea-energy_final_web.pdf

Chapters 10, 12 and 13 in the System of National Accounts 2008 includes general information relevant for an understanding of the concepts of economic assets (as defined in SNA) and the general principles behind the assets accounts. These chapters is especially relevant for the construction of asset accounts for inventories. Observe that with regard to scope of the SEEA-Energy physical asset accounts and the SNA 2008 accounts there are some important differences, since the SEEA-Energy scope is broader
<http://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf>

A dedicated UNECE website on the UNFC 2009 informs about resource classifications and mapping between different classification systems
<http://www.unece.org/energy/welcome/areas-of-work/unfc-and-resource-classification/about-unfc-and-resource-classification.html>



Explanation 1 (Slide Layer)





MODULE 4: ASSET ACCOUNTING22 / 23SEEA

Where can you find more information?

Chapters 5 and 6 in SEEA-Energy describes in more detail what has been presented in this module
https://seea.un.org/sites/seea.un.org/files/documents/seea-energy_final_web.pdf


Chapters 10, 12 and 13 in the System of National Accounts 2008 includes general information relevant for an understanding of the concepts of economic assets (as defined in SNA) and the general principles behind the assets accounts. These chapters is especially relevant for the construction of asset accounts for inventories. Observe that with regard to scope of the SEEA-Energy physical asset accounts and the SNA 2008 accounts there are some important differences, since the SEEA-Energy scope is broader
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A dedicated UNECE website on the UNFC 2009 informs about resource classifications and mapping between different classification systems
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Explanation 2 (Slide Layer)

MODULE 4: ASSET ACCOUNTING

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Where can you find more information?

Chapters 5 and 6 in SEEA-Energy describes in more detail what has been presented in this module
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<http://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf>


A dedicated UNECE website on the UNFC 2009 informs about resource classifications and mapping between different classification systems
<http://www.unece.org/energy/welcome/areas-of-work/unfc-and-resource-classification/about-unfc-and-resource-classification.html>



WCDMP is a sub-program of the World Climate Programme (WCP), and provides international coordination of the WMO Climate System Monitoring.

Explanation 3 (Slide Layer)

MODULE 4: ASSET ACCOUNTING

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Where can you find more information?

Chapters 5 and 6 in SEEA-Energy describes in more detail what has been presented in this module
https://seea.un.org/sites/seea.un.org/files/documents/seea-energy_final_web.pdf

Chapters 10, 12 and 13 in the System of National Accounts 2008 includes general information relevant for an understanding of the concepts of economic assets (as defined in SNA) and the general principles behind the assets accounts. These chapters is especially relevant for the construction of asset accounts for inventories. Observe that with regard to scope of the SEEA-Energy physical asset accounts and the SNA 2008 accounts there are some important differences, since the SEEA-Energy scope is broader.

<http://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf>

A dedicated UNECE website on the UNFC 2009 informs about resource classifications and mapping between different classification systems
<http://www.unece.org/energy/welcome/areas-of-work/unfc-and-resource-classification/about-unfc-and-resource-classification.html>



WHYCOS is a framework programme from the World Meteorological Organization. It's dedicated to improving basic observation activities, strengthening international cooperation and promoting the free exchange of data in the hydrology field.

6.23 Last Page

MODULE 4: ASSET ACCOUNTING

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Last page ...




This is the last screen in Module 4 of the in-depth training on energy statistics.

We hope that, after this introduction, you're now feeling prepared to commence with

Module 5: Basic statistics and energy balances

Thanks for learning!






7. Module 1 - Introduction




7.1 Welcome

WELCOME

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Module 1: Introduction to the SEEA Central Framework and SEEA-Energy






Notes:

7.2 Welcome...

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

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Welcome ...


... to the **Introduction to the SEEA Central Framework and SEEA-Energy!**

This module is designed to give you an overview of SEEA Central Framework (SEEA CF) and SEEA-Energy. The following topics will be covered:

- How are SEEA-Energy and other information systems related?
- Types of information in SEEA-Energy
- Advantages and policy relevance of SEEA-Energy
- Main types of accounts in SEEA-Energy
- How can we build on existing energy information?
- How are various accounts related?
- Flexibility in implementation

We appreciate your interest in accounting for energy.

Thanks for learning!



7.3 What is SEEA Energy?

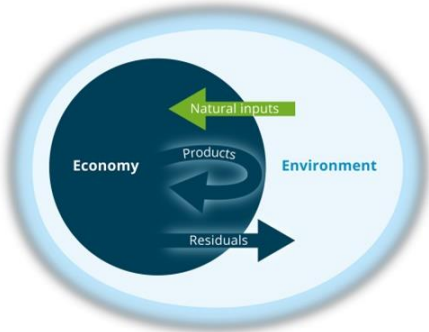
MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY





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What is SEEA-Energy?

SEEA-Energy is a subsystem of the SEEA Central Framework. It describes in detail how information on energy flows and stocks should be organized:

- SEEA-Energy provides the agreed concepts, definitions, classifications, tables, and accounts related to energy supply and use and stocks of energy resources.
- SEEA-Energy specifies not only how physical information (tons, liters, joules) on energy can be organized, but also how monetary information (dollars, euros, etc.) related to energy can be presented.
- SEEA-Energy also provides guidance on how to compile other types of information such as taxes and subsidies related to energy.






7.4 What is the link between SEEA Energy and other information systems?

(Drag and Drop, 10 points, 1 attempt permitted)

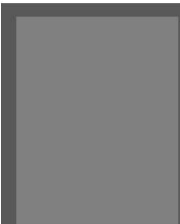
MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

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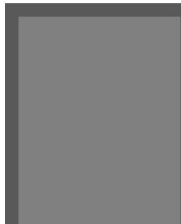
What is the link between SEEA-Energy and other information systems?



Statistical framework providing a comprehensive set of macroeconomic accounts for policy making, analysis and research purposes.




Satellite account developed to integrate measurement of environmental and economic phenomena.







Subsystem describing the organization of information for flows and stocks and changes in resources in greater detail.

SEEA-Energy is a subsystem of the SEEA Central Framework. Both SEEA CF and SEEA-Energy build upon the System of National Accounts. Let's start with sorting out how SEEA-Energy fits into the range of UN statistical standards dealing with the economy and environment. Do you know how these publications relate to each other?

Drag the publications to the corresponding fields!





Drag Item	Drop Target
Picture 5	Rectangle 2
Picture 4	Rectangle 5
Picture 7	Rectangle 6

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:

SEEA-Energy is an accounting approach which records the stocks and flows of energy.

SEEA-Energy's accounting approach is based on the SEEA Central Framework (SEEA CF).

The SEEA CF – and SEEA-Energy – are satellite accounts of the 2008 System of National Accounts (SNA).

Feedback when incorrect:

SEEA-Energy is an accounting approach which records the stocks and flows of energy.

SEEA-Energy's accounting approach is based on the SEEA Central Framework (SEEA CF).

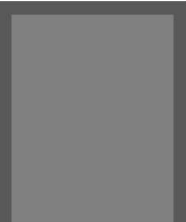
The SEEA CF – and SEEA-Energy – are satellite accounts of the 2008 System of National Accounts (SNA).

Correct (Slide Layer)

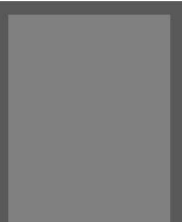
MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

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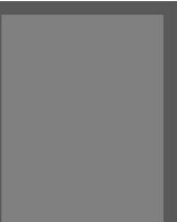
What is the link between SEEA-Energy and other information systems?



Statistical framework providing a comprehensive set of macroeconomic accounts for policy making, analysis and research purposes.



Satellite account developed to integrate measurement of environmental and economic phenomena.



Subsystem describing the organization of information for flows and stocks and changes in resources in greater detail.

SEEA-Energy is a subsystem of the SEEA Central Framework.

Very good!

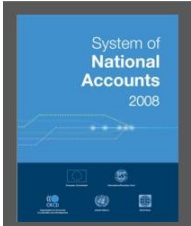
- SEEA-Energy is an accounting approach which records the stocks and flows of energy.
- SEEA-Energy's accounting approach is based on the SEEA Central Framework (SEEA CF).
- The SEEA CF – and SEEA-Energy – are satellite accounts of the 2008 System of National Accounts (SNA).

Continue


Incorrect (Slide Layer)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY 4 / 20 SEEA

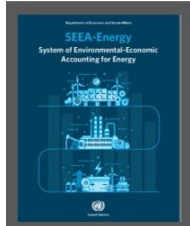
What is the link between SEEA-Energy and other information systems?



Statistical framework providing a comprehensive set of macroeconomic accounts for policy making, analysis and research purposes.



Satellite account developed to integrate measurement of environmental and economic phenomena.



Subsystem describing the organization of information for flows and stocks and changes in resources in greater detail.

SEEA-Energy is a subsystem of the SEEA Central Framework.

Not quite right. Take a look at the solution!

- SEEA-Energy is an accounting approach which records the stocks and flows of energy.
- SEEA-Energy's accounting approach is based on the SEEA Central Framework (SEEA CF).
- The SEEA CF – and SEEA-Energy – are satellite accounts of the 2008 System of National Accounts (SNA).

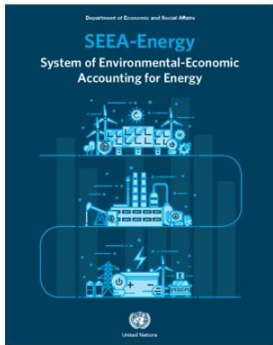

Continue

7.5 SEEA Energy and IRES

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY 5 / 20 SEEA

SEEA-Energy and SEEA CF

- SEEA Central Framework (SEEA CF) is a conceptual framework and an international statistical standard for organizing statistical information on the linkages between the economy and the environment and for describing the stocks and changes of environmental assets.
- It covers measurements in 3 main areas:
 - physical flows of materials and energy within the economy and between the economy and the environment;
 - the stocks of environmental assets and changes in these stocks;
 - economic activity and transactions related to the environment.
- SEEA-Energy is fully coherent with SEEA Central Framework but describes in more detail how to account for energy.



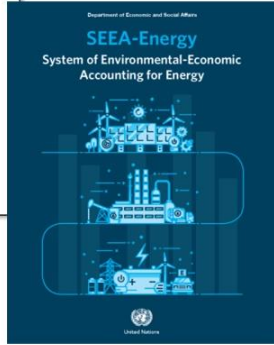
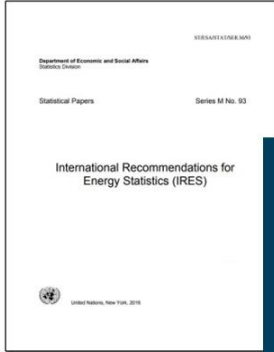
Navigation icons: Home, Previous, Next, Search.

7.6 SEEA Energy and IRES

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY 6 / 20 SEEA

SEEA-Energy and IRES

- SEEA-Energy builds on the **International Recommendations on Energy Statistics (IRES)** guidance on how basic energy statistics are collected and compiled.
- IRES is published by the United Nations Statistics Division.
- IRES provides guidance for the compilation of energy balances.



7.7 Types of information in SEEA Energy

(Drag and Drop, 10 points, 1 attempt permitted)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY 7 / 20 SEEA

Types of information in SEEA-Energy

- Extraction and capture of energy from the environment
- Production, transactions and import/export
- Losses of energy during production

- Availability of energy resources and products at the beginning of a time period
- Discoveries and extractions changing the stocks of energy during the time period
- Availability of energy resources and products at the end of the time period
- Monetary valuation of the depletion of energy resources

- Expenditure on environmental protection, clean-up and energy resource management
- The use of energy taxes and subsidies
- Other economic instruments like tradable carbon emission permits

Three main categories of information in the SEEA framework are used to answer policy questions related to energy. Can you match the type of account with the various types of information they contain?

Drag the headlines to the questions!

Asset accounts for mineral and energy resources, and changes in them

Other economic aspects related to energy

The supply and use of energy (flows)

OK

Drag Item	Drop Target
The supply and use of energy (flows)	Rectangle 4
Asset accounts for mineral and energy resources, and changes in them	Rectangle 8
Other economic aspects related to energy	Rectangle 9

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:

SEEA-Energy provides information on the role of energy within the economy, the state of mineral and energy resources, and energy-related transactions.

Feedback when incorrect:

SEEA-Energy provides information on the role of energy within the economy, the state of mineral and energy resources, and energy-related transactions.

Correct (Slide Layer)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

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Types of information in SEEA-Energy

- Extraction and capture of energy from the environment
- Production, transactions and import/export
- Losses of energy during production

- Availability of energy resources and products at the beginning of a time period
- Discoveries and extractions changing the stocks of energy during the time period
- Availability of energy resources and products at the end of the time period
- Monetary valuation of the depletion of energy resources

- Expenditure on environmental protection, clean-up and energy resource management
- The use of energy taxes and subsidies
- Other economic instruments like tradable carbon emission permits

Three main categories of information in the SEEA


Very good!

SEEA-Energy provides information on the role of energy within the economy, the state of mineral and energy resources, and energy-related transactions.

Continue

Incorrect (Slide Layer)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

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Types of information in SEEA-Energy

The supply and use of energy (flows)

- Extraction and capture of energy from the environment
- Production, transactions and import/export
- Losses of energy during production

Stocks of energy and the changes in them

- Availability of energy resources and products at the beginning of a time period
- Discoveries and extractions changing the stocks of energy during the time period
- Availability of energy resources and products at the end of the time period
- Monetary valuation of the depletion of energy resources

Other economic aspects related to energy

- Expenditure on environmental protection, clean-up and energy resource management
- The use of energy taxes and subsidies
- Other economic instruments like tradable carbon emission permits

Three main categories of information in the SEEA

Not quite right. Take a look at the solution!

SEEA-Energy provides information on the role of energy within the economy, the state of mineral and energy resources, and energy-related transactions.

Continue

7.8 Advantages of SEEA Energy

Advantages of SEEA-Energy

Coherent and consistent data and statistics on energy are a reliable basis for discussing policy issues and making decisions. One of the SEEA's main advantages is its built-in system of checks and balances:

- SEEA-Energy uses a certain type of systematic tables, i.e. accounts, to organize data - just like SEEA CF and SNA do.
- The accounts ensure that the total supply of an energy product is exactly equal to its total use.
- The amount of energy resources at the end of the period should equal the amount at the beginning plus the changes during the period.



7.9 Information silos versus integrated data

Information silos versus integrated data

Linking environmental and socio-economic data through an internationally agreed statistical framework is essential for **integrated policy making**. As an integrated accounting system, SEEA-Energy is different from individual sets of energy statistics. While individual sets are usually internally consistent, consistency between one set of statistics and another is often lacking.

Click on the images to see the difference!



7.10 Data confrontation and combining accounts

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

10 / 20  SEEA



Data confrontation and combining accounts

An important feature of SEEA-Energy is its organization of information in both physical and monetary terms. It also follows **consistent scopes, definitions and classifications, enabling a confrontation of data.** Much of the monetary data presented within the SEEA can be used by national accounts (SNA) and vice versa.

Click on the fields to see some of the ways that SEEA-Energy can help in confronting data sources, and what are some of the indicators that can be derived by combining different monetary and physical accounts!

Data confrontation

Combining the accounts



Untitled Layer 1 (Slide Layer)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

10 / 20  SEEA

Data confrontation and combining accounts

An important feature of SEEA-Energy is its organization of information in both physical and monetary terms. It also follows **consistent scopes, definitions and classifications, enabling a confrontation of data.** Much of the monetary data presented within the SEEA can be used by national accounts (SNA) and vice versa.

Click on the fields to see some of the ways that SEEA-Energy can help in confronting data sources, and what are some of the indicators that can be derived by combining different monetary and physical accounts!

Confront physical and monetary data


Data confrontation

Combining the accounts



Untitled Layer 2 (Slide Layer)

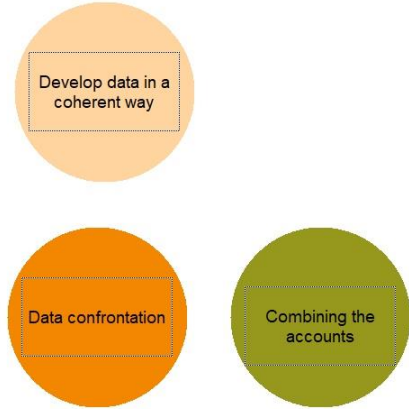
MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY



10 / 20  SEEA

Data confrontation and combining accounts

An important feature of SEEA-Energy is its organization of information in both physical and monetary terms. It also follows **consistent scopes, definitions and classifications, enabling a confrontation of data**. Much of the monetary data presented within the SEEA can be used by national accounts (SNA) and vice versa.

Click on the fields to see some of the ways that SEEA-Energy can help in confronting data sources, and what are some of the indicators that can be derived by combining different monetary and physical accounts!





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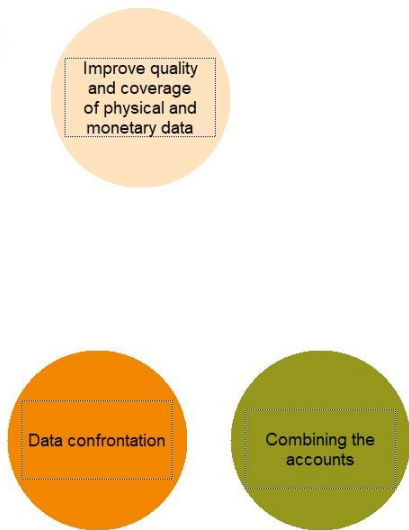
MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY





10 / 20  SEEA

Data confrontation and combining accounts

An important feature of SEEA-Energy is its organization of information in both physical and monetary terms. It also follows **consistent scopes, definitions and classifications, enabling a confrontation of data**. Much of the monetary data presented within the SEEA can be used by national accounts (SNA) and vice versa.


Click on the fields to see some of the ways that SEEA-Energy can help in confronting data sources, and what are some of the indicators that can be derived by combining different monetary and physical accounts!





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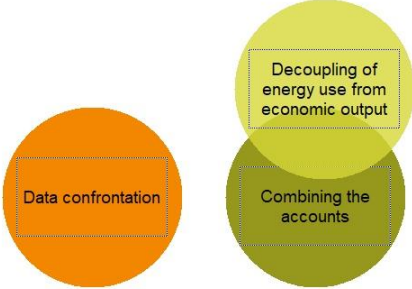
MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY





10 / 20  SEEA

Data confrontation and combining accounts

An important feature of SEEA-Energy is its organization of information in both physical and monetary terms. It also follows **consistent scopes, definitions and classifications, enabling a confrontation of data**. Much of the monetary data presented within the SEEA can be used by national accounts (SNA) and vice versa.


Click on the fields to see some of the ways that SEEA-Energy can help in confronting data sources, and what are some of the indicators that can be derived by combining different monetary and physical accounts!





Untitled Layer 5 (Slide Layer)

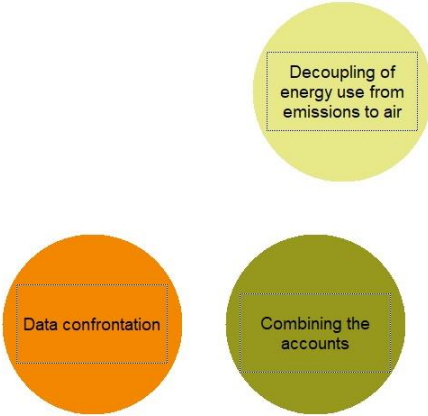
MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY





10 / 20  SEEA

Data confrontation and combining accounts

An important feature of SEEA-Energy is its organization of information in both physical and monetary terms. It also follows **consistent scopes, definitions and classifications, enabling a confrontation of data**. Much of the monetary data presented within the SEEA can be used by national accounts (SNA) and vice versa.


Click on the fields to see some of the ways that SEEA-Energy can help in confronting data sources, and what are some of the indicators that can be derived by combining different monetary and physical accounts!





Untitled Layer 6 (Slide Layer)

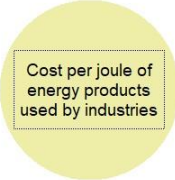
MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

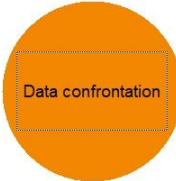
10 / 20  SEEA


Data confrontation and combining accounts





An important feature of SEEA-Energy is its organization of information in both physical and monetary terms. It also follows consistent scopes, definitions and classifications, enabling a confrontation of data. Much of the monetary data presented within the SEEA can be used by national accounts (SNA) and vice versa.

Click on the fields to see some of the ways that SEEA-Energy can help in confronting data sources, and what are some of the indicators that can be derived by combining different monetary and physical accounts!










7.11 Policy relevance of SEEA Energy accounts


MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY





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Policy relevance of SEEA-Energy accounts

SEEA-Energy allows for the analysis of policy questions from many angles: For example, **do we have an affordable, and economically and environmentally sustainable, energy supply?**

- It supports a richer understanding of the **role of energy in the economy** and helps identify key drivers of change.
- It supports the development of models and scenarios for **assessing the impact of possible policies** both within a country and between countries.
- SEEA-Energy is a starting point for **describing the environmental pressures** arising from energy production and use. This includes those related to depletion of non-renewable energy resources, as well as environmental degradation arising from energy-related emissions.





7.12 Main types of accounts in SEEA Energy

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Categories of policy questions

Depending on each country's specific characteristics and needs, different policies aimed at achieving secure and sustainable energy production and use will be emphasized. Generally, such policy objectives can be framed within the three major categories given below.

Hover above the headlines to see more!

- Improving energy distribution and access
- Managing energy supply and demand
- Reducing pressures on the environment

Navigation icons: Home, Previous, Next, Bookmarks

7.13 Categories of policy questions

(Drag and Drop, 10 points, 1 attempt permitted)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY 13 / 20 SEEA

Categories of policy questions

Given the information in the prior slide, can you sort out the examples?

Drag the policy examples to the categories!

Improving energy distribution and access

Managing energy supply and demand

Reducing pressures on the environment

Information on taxes and instruments aimed at controlling emissions

Performance and efficiency of providers in supplying energy

Usage of the available energy

OK

Navigation icons: Home, Previous, Next, Bookmarks

Drag Item	Drop Target
Usage of the available energy	Rectangle 8
Information on taxes and instruments aimed at controlling emissions	Rectangle 9
Performance and efficiency of providers in supplying energy	Rectangle 4

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)
Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:


Owing to the nature of energy issues, a full understanding of the implications of energy-related decisions requires the measurement of a large range of variables, physical and monetary. Measurement of progress towards the achievement of the goals set out in each of the policy categories requires integrated information systems.

Feedback when incorrect:

Owing to the nature of energy issues, a full understanding of the implications of energy-related decisions requires the measurement of a large range of variables, physical and monetary. Measurement of progress towards the achievement of the goals set out in each of the policy categories requires integrated information systems.

Correct (Slide Layer)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

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Categories of policy questions

Given the information in the prior slide, can you sort out the examples?

Drag the policy examples to the categories!

Improving energy distribution and access

Managing energy supply and demand

Reducing pressures on the environment

Information instruments controlling

Usage of energy


Very good!

Owing to the nature of energy issues, a full understanding of the implications of energy-related decisions requires the measurement of a large range of variables, physical and monetary. Measurement of progress towards the achievement of the goals set out in each of the policy categories requires integrated information systems.

Continue

Incorrect (Slide Layer)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

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Categories of policy questions

Given the information in the prior slide, can you sort out the examples?

Drag the policy examples to the categories!

Improving energy distribution and access

Managing energy supply and demand

Reducing pressures on the environment

Performance and efficiency of providers in supplying energy

Usage of the available energy

Information on taxes and instruments aimed at controlling emissions

Information instruments controlling

Usage of energy


Not quite right. Take a look at the solution!

Owing to the nature of energy issues, a full understanding of the implications of energy-related decisions requires the measurement of a large range of variables, physical and monetary. Measurement of progress towards the achievement of the goals set out in each of the policy categories requires integrated information systems.

Continue

7.14 Main types of accounts in SEEA Energy

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

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Main types of accounts in SEEA-Energy





Energy information is typically presented in physical terms. A particular strength of SEEA-Energy is its capacity to apply **monetary valuations to various energy-related stocks and flows**. Monetary measures of energy product flows are organized in monetary supply and use tables. For stocks, SEEA-Energy augments energy statistics by assigning monetary values to resources, and accounting for depletion arising from extractions.

Hover above the headlines to see more!

Physical flow accounts

Monetary flow accounts for energy-related transactions


Asset accounts in physical and monetary terms



7.15 The SEEA Central Framework

(Pick Many, 10 points, 1 attempt permitted)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY





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The SEEA Central Framework

An important difference between energy statistics and SEEA-Energy is the latter's compatibility with the economic information of the SNA, as well as the environmental-economic accounts of the SEEA CF and its other subsystems. Do you know **which of the following types of accounts** are covered by SNA, SEEA Central Framework and SEEA-Energy, respectively?

Check the applicable lines in the table!

	SNA	SEEA CF	SEEA-Energy
Monetary supply and use tables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical supply and use tables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monetary asset accounts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical asset accounts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



OK

Correct	Choice
X	Check Box 1
X	Check Box 2
X	Check Box 3
	Check Box 4
X	Check Box 5
X	Check Box 6
X	Check Box 7
X	Check Box 8
X	Check Box 9
	Check Box 10
X	Check Box 11
X	Check Box 12

Feedback when correct:


SEEA-Energy provides a number of fundamental extensions to the information presented in the SNA. This adds considerable value to both the physical and monetary information, because it facilitates integrated analyses within a common framework.

Feedback when incorrect:

SEEA-Energy provides a number of fundamental extensions to the information presented in the SNA. This adds considerable value to both the physical and monetary information, because it facilitates integrated analyses within a common framework.

Very good. (Slide Layer)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

15 / 20  SEEA

The SEEA Central Framework

An important difference between energy statistics and SEEA-Energy is the latter's compatibility with the economic information of the SNA, as well as the environmental-economic accounts of the SEEA CF and its other subsystems. Do you know **which of the following types of accounts** are covered by SNA, SEEA Central Framework and SEEA-Energy, respectively?

Check the applicable lines in the table!

	SNA	SEEA CF	SEEA-Energy
Monetary supply and use tables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical supply and use tables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monetary asset accounts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical asset accounts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


Very good.

SEEA-Energy provides a number of fundamental extensions to the information presented in the SNA. This adds considerable value to both the physical and monetary information, because it facilitates integrated analyses within a common framework.

[Continue](#)

Not quite right. Take a look at the solution! (Slide Layer)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

15 / 20  SEEA

The SEEA Central Framework

An important difference between energy statistics and SEEA-Energy is the latter's compatibility with the economic information of the SNA, as well as the environmental-economic accounts of the SEEA CF and its other subsystems. Do you know **which of the following types of accounts** are covered by SNA, SEEA Central Framework and SEEA-Energy, respectively?

Check the applicable lines in the table!

	SNA	SEEA CF	SEEA-Energy
Monetary supply and use tables	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Physical supply and use tables	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Monetary asset accounts	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Physical asset accounts	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Not quite right. Take a look at the solution!


SEEA-Energy provides a number of fundamental extensions to the information presented in the SNA. This adds considerable value to both the physical and monetary information, because it facilitates integrated analyses within a common framework.

[Continue](#)

7.16 The relationships between the accounts

(Drag and Drop, 10 points, 1 attempt permitted)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

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The relationships between the accounts

The accounts within SEEA-Energy are connected, but each focuses on a **different part of the interaction** between the economy and the environment. Can you sort out the connections between the examples given here?

Match the statements!




Changes in the stock of mineral and energy resources (from the asset account) are...

Measures of the flows of energy from natural inputs and energy residuals can also be ...

...the result of economic activity, which is the focus of physical flow accounts.

...related to transactions recorded in accounts for energy-related transactions, including investment in cleaner technologies and flows of energy taxes and subsidies.

OK



Drag Item	Drop Target
...related to transactions recorded in accounts for energy-related transactions, including investment in cleaner technologies and flows of energy taxes and subsidies.	Rectangle 8
...the result of economic activity, which is the focus of physical flow accounts.	Rectangle 4

Drag and drop properties
Return item to start point if dropped outside the correct drop target
Snap dropped items to drop target (Snap to center)

Allow only one item in each drop target
Delay item drop states until interaction is submitted

Feedback when correct:

These examples serve to highlight the varied relationships between accounts, each taking a different perspective.

Throughout SEEA-Energy these relationships are supported by the use of common concepts, definitions and classification. For example, the measurement of flows of mineral and energy resources within the PSUT is consistent with the extraction measurement in the asset accounts.


Feedback when incorrect:

These examples serve to highlight the varied relationships between accounts, each taking a different perspective.

Throughout SEEA-Energy these relationships are supported by the use of common concepts, definitions and classification. For example, the measurement of flows of mineral and energy resources within the PSUT is consistent with the extraction measurement in the asset accounts.

Correct (Slide Layer)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

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The relationships between the accounts

The accounts within SEEA-Energy are connected, but each focuses on a **different part of the interaction** between the economy and the environment. Can you sort out the connections between the examples given here?

Match the statements!

Changes in the stock of mineral and energy resources (from the asset account) are...

Measures of the flows of energy from natural inputs and energy residuals can also be ...

...relat
accou
action
clean
energ

Very good!


These examples serve to highlight the varied relationships between accounts, each taking a different perspective.

Throughout SEEA-Energy these relationships are supported by the use of common concepts, definitions and classification. For example, the measurement of flows of mineral and energy resources within the PSUT is consistent with the extraction measurement in the asset accounts.

Continue

Incorrect (Slide Layer)

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

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The relationships between the accounts

The accounts within SEEA-Energy are connected, but each focuses on a **different part of the interaction** between the economy and the environment. Can you sort out the connections between the examples given here?

Match the statements!

Changes in the stock of mineral and energy resources (from the asset account) are...

...the result of economic activity, which is the focus of physical flow accounts.

Measures of the flows of energy from natural inputs and energy residuals can also be ...

...related to transactions recorded in accounts for energy-related transactions, including investment in cleaner technologies and flows of energy taxes and subsidies.

...relat
accou
action
clean
energ

Not quite right. Take a look at the solution!

These examples serve to highlight the varied relationships between accounts, each taking a different perspective.

Throughout SEEA-Energy these relationships are supported by the use of common concepts, definitions and classification. For example, the measurement of flows of mineral and energy resources within the PSUT is consistent with the extraction measurement in the asset accounts.

Continue

7.17 Flexibility in implementation

MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY17 / 20SEEA

Flexibility in implementation

A country may choose to implement **only a selection of the accounts** included in SEEA-Energy. This decision is based on policy priorities and the extent and type of its energy resources, the characteristics of its energy production and use, and its specific energy-related issues.

Click on the fields to see more!

The diagram consists of two circles. The left circle is orange and contains the text 'Countries with a high dependence on imports of energy products'. The right circle is green and contains the text 'Countries concerned with the reduction of energy-related carbon emissions'. Both circles have a dashed border.

Untitled Layer 1 (Slide Layer)

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Flexibility in implementation


A country may choose to implement **only a selection of the accounts** included in SEEA-Energy. This decision is based on policy priorities and the extent and type of its energy resources, the characteristics of its energy production and use, and its specific energy-related issues.

Click on the fields to see more!

The diagram consists of three circles. The left circle is orange and contains the text 'Countries with a high dependence on imports of energy products'. The middle circle is also orange and contains the text 'Physical flow accounts for these products'. The right circle is green and contains the text 'Countries concerned with the reduction of energy-related carbon emissions'. All three circles have a dashed border.

Untitled Layer 2 (Slide Layer)

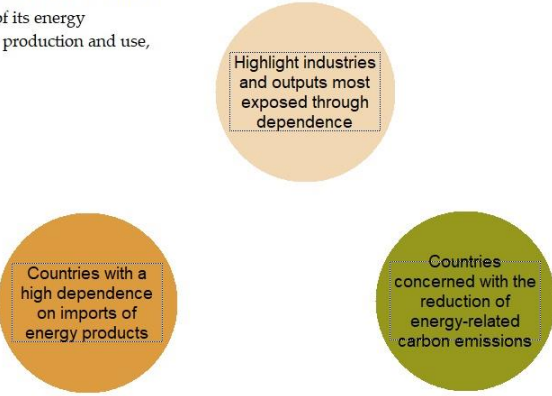
MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

17 / 20  SEEA

Flexibility in implementation

A country may choose to implement **only a selection of the accounts** included in SEEA-Energy. This decision is based on policy priorities and the extent and type of its energy resources, the characteristics of its energy production and use, and its specific energy-related issues.





Click on the fields to see more!



Highlight industries and outputs most exposed through dependence


Countries with a high dependence on imports of energy products

Countries concerned with the reduction of energy-related carbon emissions



Untitled Layer 4 (Slide Layer)

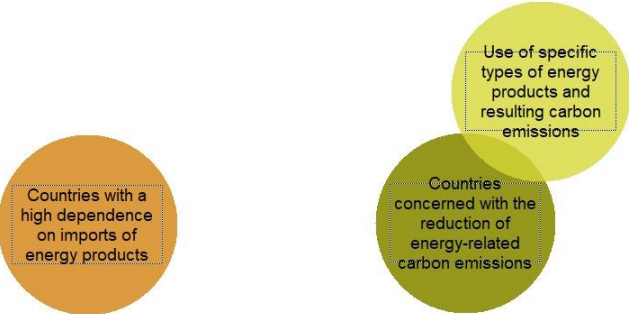
MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY

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Flexibility in implementation

A country may choose to implement **only a selection of the accounts** included in SEEA-Energy. This decision is based on policy priorities and the extent and type of its energy resources, the characteristics of its energy production and use, and its specific energy-related issues.





Click on the fields to see more!



Use of specific types of energy products and resulting carbon emissions

Countries with a high dependence on imports of energy products

Countries concerned with the reduction of energy-related carbon emissions



Untitled Layer 5 (Slide Layer)

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Flexibility in implementation

A country may choose to implement **only a selection of the accounts** included in SEEA-Energy. This decision is based on policy priorities and the extent and type of its energy resources, the characteristics of its energy production and use, and its specific energy-related issues.

Click on the fields to see more!

The diagram consists of three colored circles arranged in a triangle. The top circle is yellow and contains the text 'Develop tradable permits scheme for emitting carbon'. The bottom-left circle is orange and contains the text 'Countries with a high dependence on imports of energy products'. The bottom-right circle is green and contains the text 'Countries concerned with the reduction of energy-related carbon emissions'.

7.18 Summary

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Summary





- SEEA-Energy is a subsystem of the SEEA Central Framework. It describes in detail the organization of information for energy flows, stocks and changes of energy resources.
- SEEA-Energy specifies an organized form for physical and monetary information on energy.
- SEEA-Energy includes three main types of information on energy:
 - The supply and use of energy
 - The stocks of energy and changes in them
 - Other economic aspects related to energy
- The most important tables/accounts in SEEA-Energy are the supply and use tables and asset accounts for energy.
- SEEA-Energy and SEEA CF are fully coherent and complement national accounts (SNA).
- SEEA-Energy ensures coherence and completeness of energy information.
- Combining SEEA-Energy accounts, physical and monetary accounts for instance, enables many types of analysis.
- SEEA-Energy is modular and can be implemented in parts as most appropriate for a specific country.

7.19 Where do you find more information?

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Where do you find more information?

- General information on SEEA and the SEEA Central Framework, SEEA-Energy and many other publications available for download at:
seea.un.org
- SEEA-Energy website:
seea.un.org/seea-energy
- The International Recommendation of Energy Statistics and related information available for download at:
<http://unstats.un.org/unsd/energy/ires/>
- Download the IEA and Eurostat manual on Energy Statistics at:
<https://www.iea.org/publications/freepublications/publication/energy-statistics-manual.html>

7.20 Last Page


MODULE 1: INTRODUCTION TO THE SEEA CF AND SEEA ENERGY 20 / 20 SEEA





Last page ...

This is the last screen in Module 1 of the in-depth training on energy statistics. We hope that after this introduction you're feeling prepared to get started with

Module 2: Definitions and accounting structures

Thanks for learning!



8. Glossary

8.1 Glossary Start

GLOSSARY

SEEA

A

Accumulation is an economic activity in which goods, services and financial resources are retained for use or consumption in future accounting periods.

Asset: a store of value representing a benefit or series of benefits accruing to an economic owner by holding or using the entity over a period of time. It is a means of carrying forward value from one accounting period to another.

Asset life (also known as the resource life) is the expected time over which an asset can be used in production or the expected time over which extraction from a natural resource can take place.

B

Balancing item: an accounting construct obtained by subtracting the total value of the entries on one side of an account (resources or changes in liabilities) from the total value of the entries on the other side (uses or changes in assets).

Basic price: the amount receivable by the producer from the purchaser for a unit of a good or service produced as output, minus any tax payable, and plus any subsidy receivable by the producer as a consequence of its production or sale. It excludes any transport charges invoiced separately by the producer and any wholesale and retail margins that may be applicable.

C

Capital transfers are unrequited transfers where either the party making the transfer realizes the funds involved by disposing of an asset (other than cash or inventories), relinquishing a financial claim (other than accounts receivable), or the party receiving the transfer is obliged to acquire an asset (other than cash) or both conditions are met.

Catastrophic losses are reductions in assets due to catastrophic and exceptional events.

Changes in inventories are measured by the value of the entries into inventories less the value of withdrawals and less the value of any recurrent losses of goods held in inventories during the accounting period.

Compensation of employees is the total remuneration, in cash or in kind, payable by an enterprise to an employee in return for work done by the latter during the accounting period.

Consumption is the use of goods and services for the satisfaction of individual or collective human needs or wants

Consumption of fixed capital is the decline, during the course of the accounting period, in the current value of the stock of fixed assets owned and used by a producer as a result of physical deterioration, normal obsolescence or normal accidental damage.

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M N O P R S T U V W

8.2 Glossary D E

GLOSSARY

SEEA

Corporations cover legally constituted corporations and also cooperatives, limited liability partnerships, notional resident units and quasi-corporations.

Cultivated biological resources cover animal resources yielding repeat products and tree, crop and plant resources yielding repeat products whose natural growth and regeneration are under the direct control, responsibility and management of an institutional unit.

Current transfers are transactions in which one institutional unit provides a good, service or asset to another unit without receiving from the latter any good, service or asset directly in return as counterpart and does not oblige one or both parties to acquire, or dispose of, an asset.

D

Decommissioning costs relate to expenditures incurred at the end of the operating life of an asset to restore the surrounding environment. They comprise Terminal costs and Remedial costs.

Depletion, in physical terms, is the decrease in the quantity of the stock of a natural resource over an accounting period that is due to the extraction of the natural resource by economic units occurring at a level greater than that of regeneration.

Discount rate: a rate of interest used to adjust the value of a stream of future flows of revenue, costs or income to account for time preferences and attitudes to risk.

Discoveries are additions representing the arrival of new resources to a stock and commonly arise through exploration and evaluation.

Dissipative losses are material residues that are an indirect result of production and consumption activity.

Dissipative uses of products covers products that are deliberately released to the environment as part of production processes.

E

Economic activity comprises the activities of production, consumption and accumulation. (See also Accumulation, Consumption, Production.)

Economic assets (see Asset).

Economic benefits reflect a gain or positive utility arising from economic production, consumption or accumulation.

Economic owner: the institutional unit entitled to claim the benefits associated with the use of an asset in the course of an economic activity by virtue of accepting the associated risks.

Economic rent is the surplus value accruing to the extractor or user of an asset calculated after all costs and normal returns have been taken into account.

Economic territory: the area under effective control of a single government. It includes the land area of a country, including islands, airspace, territorial waters and territorial enclaves in the rest of the world. Economic territory excludes territorial enclaves of other countries and international organizations located in the reference country.

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8.3 Glossary E

GLOSSARY

SEEA

Economic units (see Institutional units).

Emissions are substances released to the environment by establishments and households as a result of production, consumption and accumulation processes.

Emissions to air are gaseous and particulate substances released to the atmosphere by establishments and households as a result of production, consumption and accumulation processes.

Energy from natural inputs encompasses flows of energy from the removal and capture of energy from the environment by resident economic units.

Energy losses include energy losses during extraction, distribution, storage and transformation.

Energy products are products that are used (or might be used) as a source of energy. They comprise (a) fuels that are produced/generated by an economic unit (including households) and are used (or might be used) as sources of energy; (b) electricity that is generated by an economic unit (including households); and (c) heat that is generated and sold to third parties by an economic unit.

Energy residuals comprise energy losses and other energy residuals (primarily heat generated when end-users use energy products for energy purposes).

Enterprise: the view of an institutional unit as a producer of goods and services.

Environmental assets are the naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity.

Environmental subsidies and similar transfers are transfers intended to support activities that protect the environment or reduce the use and extraction of natural resources.

Environmental taxes are taxes whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific negative impact on the environment.

Establishment: an enterprise, or part of an enterprise, that is situated in a single location and in which only a single productive activity is carried out, or in which the principal productive activity accounts for most of the value added.

Exclusive economic zone (EEZ) of a country: the area extending up to 200 nautical miles from a country's normal baselines as defined in the United Nations Convention on the Law of the Sea of 10 December 1982.

Exports of goods and services consist of sales, barter, or gifts and grants, of goods and services from residents to non-residents.

Extractions are reductions in stock due to the physical removal or harvest of an environmental asset through a process of production.

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M N O P R S T U V W

8.4 Glossary F G

GLOSSARY

SEEA

F

Financial corporations consist of all resident corporations that are principally engaged in providing financial services, including insurance and pension funding services, to other institutional units. (2.111)

Fixed assets are produced assets that are used repeatedly or continuously in production processes for more than one year.

G

General government is the institutional sector consisting of mainly central, state and local government units together with social security funds imposed and controlled by those units.

General government final consumption expenditure consists of expenditure, including expenditure whose value must be estimated indirectly, incurred by general government on both individual consumption goods and services and collective consumption services.

Gross capital formation shows the acquisition less disposal of produced assets for purposes of fixed capital formation, inventories or valuables.

Gross domestic product (GDP) is an aggregate measure of gross value added for all resident institutional units. It can be measured in three conceptually equivalent ways: (a) *Income measure of GDP.* The income measure of gross domestic product (GDP) is derived as compensation of employees plus gross operating surplus plus gross mixed incomes plus taxes less subsidies on both production and imports; (b) *Expenditure measure of GDP.* The expenditure measure of gross domestic product (GDP) is derived as the sum of expenditure on final consumption plus gross capital formation plus exports less imports; (c) *Production measure of GDP.* The production measure of gross domestic product (GDP) is derived as the value of output less intermediate consumption plus any taxes less subsidies on products not already included in the value of output.

Gross energy input reflects the total energy captured from the environment, energy products that are imported and energy from residuals within the economy.

Gross fixed capital formation is measured by the total value of a producer's acquisitions, less disposals, of fixed assets during the accounting period plus certain specified expenditure on services that adds to the value of non-produced assets.

Gross mixed income is the surplus or deficit accruing from production by unincorporated enterprises owned by households before the deduction of consumption of fixed capital. It implicitly contains an element of remuneration for work done by the owner or other members of the household.

A B C D E F G H I L

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8.5 Glossary H I

GLOSSARY

SEEA

Gross national income (GNI) is defined as GDP plus compensation of employees receivable from abroad plus property income receivable from abroad plus taxes less subsidies on production receivable from abroad less compensation of employees payable abroad less property income payable abroad and less taxes plus subsidies on production payable abroad.

Gross operating surplus is the surplus or deficit accruing from production before taking account of any interest, rent or similar flows payable or receivable and before the deduction of consumption of fixed capital.

Gross releases comprise emissions to the environment and substances captured within economic units or transferred to other economic units.

Gross value added is the value of output less the value of intermediate consumption.

H

Household: a group of persons who share the same living accommodation, who pool some, or all, of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food.

Household final consumption expenditure consists of the expenditure, including expenditure whose value must be estimated indirectly, incurred by resident households on individual consumption goods and services, including those sold at prices that are not economically significant and including consumption goods and services acquired abroad.

I

Imports of goods and services consist of purchases, barter, or receipts of gifts or grants, of goods and services by residents from non-residents.

Individual environmental assets are those environmental assets that may provide resources for use in economic activity. They comprise mineral and energy resources, land, soil resources, timber resources, aquatic resources, other biological resources and water resources.

Industry consists of a group of establishments engaged in the same, or similar, kinds of activity.

Inputs of energy from renewable sources are the non-fuel sources of energy provided by the environment.

Institutional sector: a grouping of similar institutional units. An institutional unit can be allocated to only one type of institutional sector.

Institutional unit: an economic entity that is capable, in its own right, of owning assets, incurring liabilities and engaging in economic activities and in transactions with other entities.

Intermediate consumption consists of the value of the goods and services consumed as inputs by a process of production, excluding fixed assets whose consumption is recorded as consumption of fixed capital.

A B C D E F G H I L

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8.6 Glossary L M N

GLOSSARY

SEEA

Inventories are produced assets that consist of goods and services, which came into existence in the current period or in an earlier period, and that are held for sale, use in production or other use at a later date.

L

Land is a unique environmental asset that delineates the space in which economic activities and environmental processes take place and within which environmental assets and economic assets are located.

Land cover refers to the observed physical and biological cover of the Earth's surface and includes natural vegetation and abiotic (non-living) surfaces.

Land use reflects both (a) the activities undertaken and (b) the institutional arrangements put in place for a given area for the purposes of economic production, or the maintenance and restoration of environmental functions.

Losses during distribution are losses that occur between a point of abstraction, extraction or supply and a point of use.

Losses during extraction are losses that occur during extraction of a natural resource before there is any further processing, treatment or transportation of the extracted resource.

Losses during storage are losses of materials, water and energy products held in inventories.

Losses during transformation refer to the energy lost, for example, in the form of heat, during the transformation of one energy product into another energy product.

M

Market prices are defined as amounts of money that willing buyers pay to acquire something from willing sellers.

Mineral and energy resources comprise known deposits of oil resources, natural gas resources, coal and peat resources, non-metallic minerals and metallic minerals.

N

Natural biological resources consist of animals, birds, fish and plants that yield both once-only and repeat products for which natural growth and/or regeneration is not under the direct control, responsibility and management of institutional units.

Natural inputs are all physical inputs that are moved from their location in the environment as a part of economic production processes or are directly used in production.

Natural regression of forest and other wooded land is a decrease in an area of forest and other wooded land that occurs for natural reasons.

Natural resource inputs comprise physical inputs to the economy from natural resources.

Natural resource residuals are natural resource inputs that do not subsequently become incorporated into production processes and, instead, immediately return to the environment.

A B C D E F G H I L

M N O P R S T U V W

8.7 Glossary O

GLOSSARY

SEEA

Naturally regenerated forest is forest that is predominantly composed of trees established through natural regeneration. In this context, “predominantly” means that the trees established through natural regeneration are expected to constitute more than 50 per cent of the growing stock at maturity.

Net domestic energy use is the end use of energy products less exports of energy products plus all losses of energy.

Net lending is defined as the difference between changes in net worth due to saving and capital transfers and net acquisitions of non-financial assets (acquisitions less disposals of non-financial assets, less consumption of fixed capital). If the amount is negative it represents net borrowing.

Net present value is the value of an asset determined by estimating the stream of income expected to be earned in the future and then discounting the future income back to the present accounting period.

Net worth is defined as the value of all the assets owned by an institutional unit or sector less the value of all its outstanding liabilities.

Non-financial corporations are corporations whose principal activity is the production of market goods or non-financial services.

Non-market output consists of goods and individual or collective services produced by non-profit institutions serving households (NPISHs) or government that are supplied free, or at prices that are not economically significant, to other institutional units or the community as a whole.

Non-produced assets are assets that have come into existence in ways other than through processes of production.

Non-profit institutions serving households (NPISHs) consist of non-market NPIs that are not controlled by government.

Non-specialist producers produce environmental goods and services for sale but not as their primary activity.

O

Other changes in the volume of assets are those changes in assets, liabilities and net worth during an accounting period that are due neither to transactions nor to holding gains and losses.

Other naturally regenerated forest is naturally regenerated forest with clearly visible indications of human activities. These include

- (a) selectively logged-over areas, areas regenerating following agricultural land use and areas recovering from human-induced fires, etc.;
- (b) forests where it is not possible to distinguish whether they are planted or naturally regenerated;
- (c) forests with a mix of naturally regenerated trees and planted/seeded trees and where the naturally regenerated trees are expected to constitute more than 50 per cent of the growing stock at stand maturity;
- (d) coppice from trees established through natural regeneration; and
- (e) naturally regenerated trees of introduced species.

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M N O P R S T U V W

8.8 Glossary P

GLOSSARY

SEEA

Output is defined as the goods and services produced by an establishment, excluding the value of any goods and services used in an activity for which the establishment does not assume the risk of using the products in production, and excluding the value of goods and services consumed by the same establishment except for goods and services used for capital formation (fixed capital or changes in inventories) or own final consumption.

Own-account activity consists of the production and use of goods and services within an establishment or household.

P

Physical flows are reflected in the movement and use of materials, water and energy.

Planted forests are predominantly composed of trees established through planting and/or deliberate seeding. Planted/seeded trees are expected to constitute more than 50 per cent of the growing stock at maturity, including coppice from trees that were originally planted or seeded.

Primary forest is naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed. Key characteristics of primary forests are that: (a) they show natural forest dynamics, such as natural tree species composition, occurrence of dead wood, natural age structure and natural regeneration processes; (b) the area is large enough to maintain its natural characteristics; and (c) there has been no known significant human intervention or the last significant human intervention occurred long enough in the past to have allowed the natural species composition and processes to have become re-established.

Primary incomes are incomes that accrue to institutional units as a consequence of their involvement in processes of production or ownership of assets that may be needed for purposes of production.

Principal activity of a producer unit: the activity whose value added exceeds that of any other activity carried out within the same unit.

Produced assets are assets that have come into existence as outputs of production processes that fall within the production boundary of the SNA.

Producers price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any VAT, or similar deductible tax, invoiced to the purchaser. It excludes any transport charges invoiced separately by the producer.

Products are goods and services (including knowledge-capturing products) that result from a process of production.

Production is an activity, carried out under the responsibility, control and management of an institutional unit, that uses inputs of labour, capital, and goods and services to produce outputs of goods and services.

Production boundary of the SNA includes the following activities:

- (a) the production of all goods or services that are supplied to units other than their producers, or intended to be so supplied, including the production of goods or services used up in the process of producing such goods or services;

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GLOSSARY

SEEA

(b) the own-account production of all goods that are retained by their producers for their own final consumption or gross capital formation;

(c) the own-account production of knowledge capturing products that are retained by their producers for their own final consumption or gross capital formation but excluding (by convention) such products produced by households for their own use;

(d) the own-account production of housing services by owner occupiers; and

(e) the production of domestic and personal services by employing paid domestic staff.

Purchaser's price: the amount paid by the purchaser, excluding any VAT or similar tax deductible by the purchaser, in order to take delivery of a unit of a good or service at the time and place required by the purchaser. The purchaser's price of a good includes any transport charges paid separately by the purchaser to take delivery at the required time and place.

R

Reappraisals reflect changes in the measured stock of assets due to the use of updated information that permits a reassessment of the size of the stock.

Reclassifications are changes in assets that result from situations in which an asset is used for a different purpose. A reclassification of an asset in one category should be offset by an equivalent reclassification in another category.

Remedial costs are incurred when production has already ceased with no provision having been made for the taking of remedial action while production was in progress.

Rent is the income receivable by the owner of natural resources or land (the lessor or landlord) for putting the natural resource or land at the disposal of another institutional unit (a lessee or tenant) for use of the natural resource or land in production.

Residence of an institutional unit: the economic territory with which it has the strongest connection, in other words, its centre of predominant economic interest.

Residuals are flows of solid, liquid and gaseous materials, and energy, that are discarded, discharged or emitted by establishments and households through processes of production, consumption or accumulation.

Resource rent is the economic rent that accrues in relation to environmental assets, including natural resources.

Rest of the world: consists of all non-resident institutional units that enter into transactions with resident units, or have other economic links with resident units.

Return to environmental assets: the income attributable to the use of environmental assets in a production process after deducting all costs of extraction including any costs of depletion of natural resources.

Return to produced assets: the income attributable to the use of produced assets in a production process after deducting any associated consumption of fixed capital.

Revaluations relate to changes in the value of assets due to price changes and reflect nominal holding gains and losses on environmental assets. The nominal holding gain for environmental assets is calculated in the same way as for non-financial assets, as the increase in value accruing to the owner of the asset as a result of a change in its price over a period of time.

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M N O P R S T U V W

8.10 Glossary S T U V W

GLOSSARY

SEEA

S

Solid waste covers discarded materials that are no longer required by the owner or user.

Subsidies are current unrequited payments that government units, including non-resident government units, make to enterprises on the basis of the levels of their production activities or the quantities or values of the goods or services that they produce, sell or import.

T

Taxes are compulsory, unrequited payments, in cash or in kind, made by institutional units to government units.

Terminal costs are costs that can and should be anticipated during the production periods prior to closure of an operating asset.

Timber resources are defined, within the relevant areas, by the volume of trees, living or dead, and include all trees regardless of diameter, tops of stems, large branches and dead trees lying on the ground that can still be used for timber or fuel.

Transaction: an economic flow that is an interaction between institutional units by mutual agreement or an action within an institutional unit that it is analytically useful to treat like a transaction, often because the unit is operating in two different capacities.

Transfer is a transaction in which one institutional unit provides a good, service or asset to another unit without receiving from the latter any good, service or asset in return as a direct counterpart.

U

Unit resource rent is the resource rent per unit of resource extracted.

Unused extraction covers extracted natural resources in which the extractor has no ongoing interest (e.g., mining overburden, mine dewatering and discarded catch)

User cost of produced assets: the sum of the consumption of fixed capital and the return to produced assets.

V

Value added (gross) is the value of output less the value of intermediate consumption. Net value added is gross value added less consumption of fixed capital.

W

Waste (see Solid waste).

A B C D E F G H I L

M N O P R S T U V W