Energy accounts

Ole Gravgård
Statistics Denmark
ogp@dst.dk

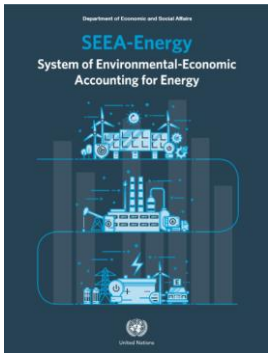
STATISTICS DENMARK

Presentation

- What do we mean by energy accounts ?
- Why do we need energy accounts ?
- Example: (simplified) energy account for Denmark
- Some characteristics of energy accounts
  – and how they differ from energy balances
- Summary: main points

What do we mean by *energy accounts?*

The term *energy accounts* is used to describe how energy data should be organised according to the System of Environmental Economic Accounting - Central Framework (SEEA) and the publication *SEEA Energy*



Energy accounts are developed in the tradition of the national accounts

Energy accounts are closely linked to - and usually based on - *energy statistics* and *energy balances* – but they do differ !

Why do we need energy accounts when we have energy balances ?

- Fully developed they include both monetary and physical information
- They can better be used for analysis of the interaction between *economic activities* and *energy supply and use*
- They can immediately be used as data inputs to e.g. macroeconomic modelling
- They are a excellent starting point for the developent of SEEA air emissions accounts

Example: A simplified[1)] energy account

Supply of energy - Denmark 2018

Supply of energy Unit: PJ (petajoule)	Crude oil	Natural gas	Coal	Wind power, biomass, etc.	Waste	Petrol, gas oil, etc.	Heat and electricity
Total supply of energy	**463**	**328**	**66**	**271**	**18**	**1 016**	**291**
Renewable energy from the environment				**66**			
Total output by industries	**260**	**307**		**94**		**298**	**238**
Agriculture, forestry and fishing				66			
Mining and quarrying	244	158					
Manufacturing	17			11		298	
Utility services		149		17			238
Imports	**203**	**20**	**66**	**83**	**2**	**718**	**53**
Supply of waste for energy purposes				**28**	**16**		

Natural inputs

Energy products

Residuals

[1)] The account is simplified in the sense that it does not show all types of energy flows

Use of energy - Denmark 2018

Total use = total supply

National accounts' classification and categories

Losses of energy

Use of energy Unit: PJ (petajoule)	Crude oil	Natural gas	Coal	Wind power, biomass, etc.	Waste	Petrol, gas oil, etc.	Heat and electricity
Total use of energy	**463**	**328**	**66**	**271**	**18**	**1 016**	**291**
Use by households		**24**		**55**		**90**	**104**
Total use by industries	**326**	**243**	**67**	**197**	**18**	**691**	**119**
Agriculture, forestry and fishing		2	0	4		23	8
Mining and quarrying		20	0	1	0	1	0
Manufacturing	326	27	5	11	1	30	35
Utility services		187	62	175	17	6	6
Construction		0		1		22	1
Trade and transport etc.		3		3		591	30
Other industries		4		3		18	38
Changes in inventories	**40**	**- 5**	**- 1**	**5**		**- 18**	
Exports	**97**	**62**	**0**	**14**		**252**	**35**
Distribution losses etc.		**4**					**32**

Some characteristics of energy accounts

N*atural inputs, energy products and residuals* makes it possible to describe all flows of energy from extraction of energy resources from nature through production, trade and use of energy products and finally to the losses of energy to the environment

Energy accounts follows the ***national accounts' definitions and classifications***

- in a few countries monetary energy accounts are even integrated with/a part of the national accounts

- Easy to establish links to economic analysis, e.g. coherent estimation of energy efficiencies for individual industries

Energy accounts include a full and explicit balancing of flows

Products:
Supply of petrol = Output of petrol by refineries + Imports of petrol

is equal to

Use of petrol = Intermediate consumption of petrol+ Household Consumption of petrol + Changes in inventories of petrol + Exports of petrol

Industries and households:
Energy inputs to an industry = Energy extracted or captured from the environment + intermediate consumption of energy

is equal to

Energy output from the industry = Outputs of energy products + Energy residuals/heat losses from the industry

Important differences between energy balances and energy accounts

Besides *formats and classifications* differences between energy accounts and balances are mainly related to the recording of *energy for transport:*

- Sectors versus industries
- Territory versus residence/economic activities

Sectors and industries - different allocation

Energy balances

	PJ (petajoule)
Households	0
Services	0
Industry	0
Agriculture/Forestry/Fishing	0
Transport	**106**

Energy accounts

	PJ (petajoule)
Households	30
Agriculture, forestry and fishing	3
Mining and quarrying	0
Manufacturing	5
Utility services	2
Construction	15
Trade and transport etc.	39
Other industries	12
Total	**106**

Functional transport sector including *all* transport

Activity based industries and households including own account transport

Transport *service industry*

International transport (sea, air, land)

Energy balances:

Suppy and and use in the *territory*

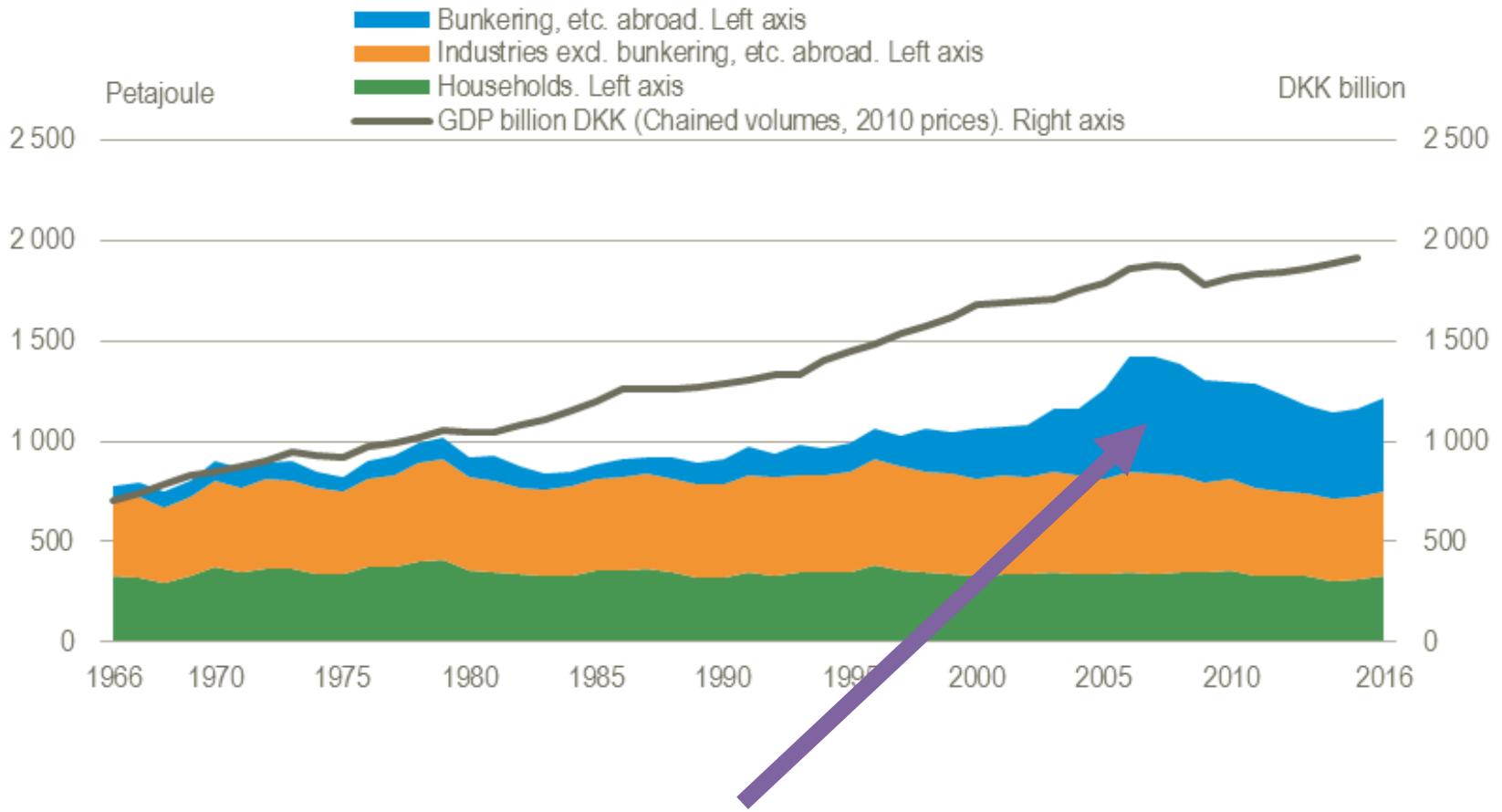
- Exclude energy bought outside the territory

Energy accounts:

Supply and use by residents of the country

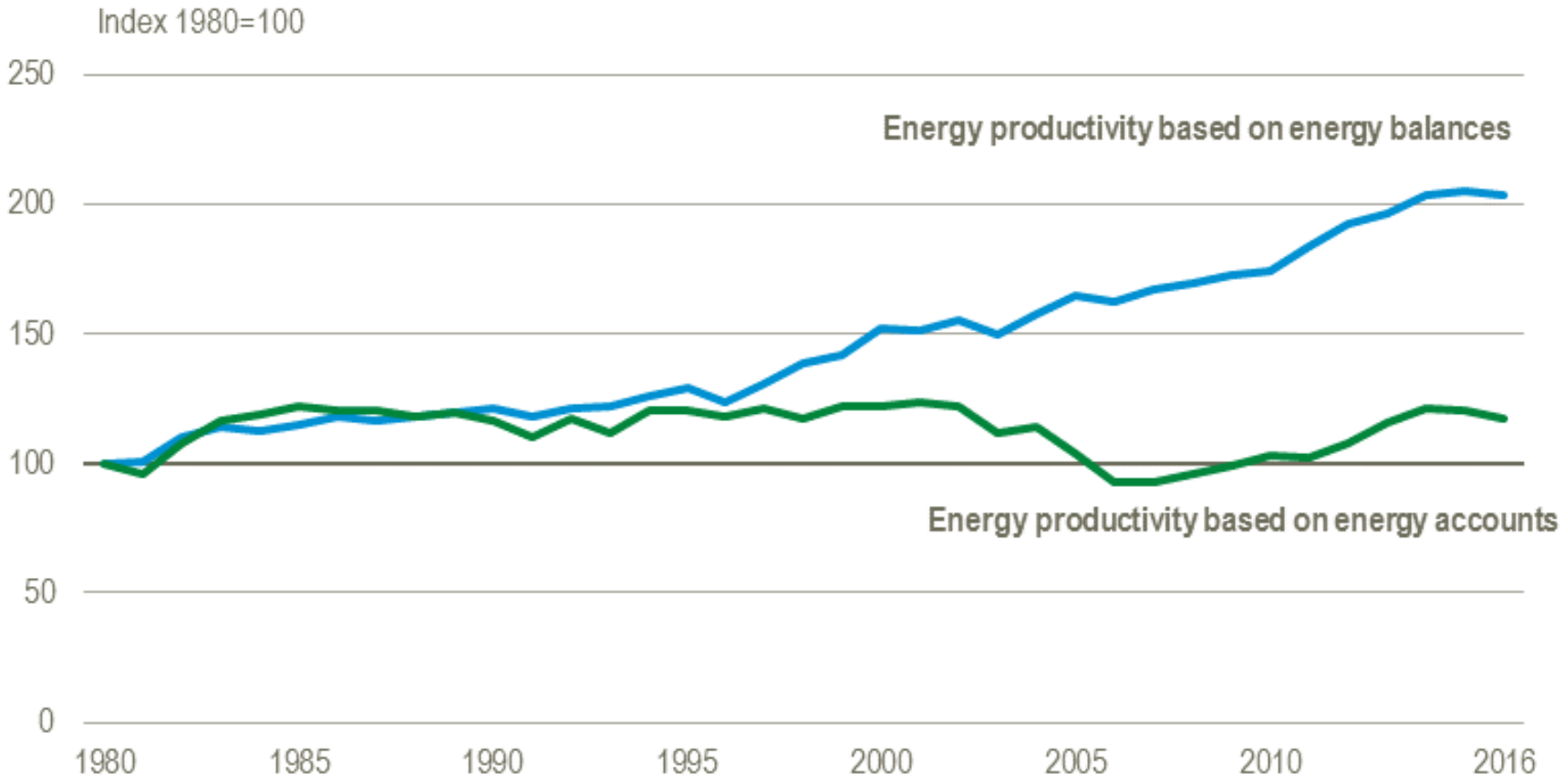
- Include energy bought outside territory by residents
- Exclude energy bought on territory by non-residents

Example: Danish energy consumption



Bunkering of energy by Danish ships, etc. outside Danish territory

Energy productivity based on energy balances vs. energy accounts



Energy productivity: GDP divided by industries' energy consumption

Main points

- Definitions, accounting structures and classifications in **SEEA Energy** are the same as in SEEA CF and the national accounts
- The use of the **residence principle** instead of the territory principle distinguishes SEEA Energy from energy statistics and energy balances – thus they may present a different picture of the development
- The **terminology** is sometimes different compared to energy statistics
- Energy accounts can be made in **physical (joules) and monetary units (Euro, etc**.), but usually starts with the physical
- Three main groups of energy is recorded in SEEA Energy: **natural inputs, energy products and residuals**
- **Balancing principle:**
  Supply = use
  inputs =outputs