

**Documentation of statistics for  
Energy Accounts for Denmark 2012**

## 1 Introduction

The energy accounts link data on energy with the national accounts. The energy accounts are based on the same definitions and classifications as the national accounts. This implies that the use of energy as described in the energy accounts is fully consistent with the description of the economic activity as described in the national accounts. The energy accounts are for each energy commodity made up in both physical quantities as well as in monetary values. The system is based on the identity that the supply must equal the use. The supply is made up as the total of Danish production etc. and imports. The use is the total exports, waste and cable losses, changes in inventories, input in 117 industries as well as private consumption broken down by five groups of private consumption. The monetary values are calculated at basic prices, trade margins, taxes, VAT and purchasers prices (market prices). In 1974, the first energy accounts for Denmark were made as a reaction to the first oil crisis. At the same time the accounts were made for the years back to 1966. In 1996, the Danish Energy Agency and Statistics Denmark entered into a cooperation agreement concerning the extension and improved coordination of the Danish energy statistics.

## 2 Statistical presentation

The energy accounts account for 46 different energy commodities. The energy accounts are made up in both physical quantities (tonnes, m<sup>3</sup>, GWh), heating values (joule) and net energy consumption as well as monetary values. The monetary values are calculated at basic prices, trade margins, energy-, CO<sub>2</sub>-, SO<sub>2</sub>-taxes, VAT and purchasers prices (market prices).

### 2.1 Data description

The following 46 energy products are included in the Energy Accounts. Energy products are grouped according to 8 energy types.

#### Oil Products

1. Crude oil (tonnes)
2. Refinery feedstocks (tonnes)
3. Refinery gas (tonnes)
4. LPG (tonnes)
5. LPG for transport (tonnes)
6. LVN (tonnes)
7. Motor gasoline, colored (tonnes)
8. Motor gasoline, unleaded (tonnes)
9. Motor gasoline, leaded (tonnes)
10. JP4 (tonnes)
11. Kerosene (tonnes)
12. Aviation gasoline (tonnes)
13. Jet petroleum (tonnes)
14. Jet petroleum bunkered by Danish operated planes abroad (tonnes)
15. Gasoil (tonnes)
16. Diesel bunkered by Danish operated vehicles abroad (tonnes)
17. Diesel oil (tonnes)
18. Fuel oil (tonnes)
19. Fuel oil bunkered by Danish operated ships abroad (tonnes)
20. Waste oil (tonnes)
21. Petroleum coke (tonnes)
22. Orimulsion (tonnes)

#### Natural Gas

1. Natural gas 1, North Sea and imports (1000 Nm<sup>3</sup>)
2. Natural gas 2, large-scale consumers and exports (1000 Nm<sup>3</sup>)
3. Natural gas 3 to industries and households (1000 Nm<sup>3</sup>)

#### Coal and Coke

1. Coal (tonnes)
2. Coke (tonnes)
3. Brown coal briquettes (tonnes)

#### Waste

1. Waste, non renewable (tonnes)

#### Renewable energy

1. Waste, renewable (tonnes)
2. Wind power (GWh)
3. Hydro power (GWh)
4. Solar power (GWh)
5. Solar heat (TJ)
6. Geothermal (TJ)
7. Straw (tonnes)
8. Firewood (1000 m<sup>3</sup>)
9. Wood chips (tonnes)
10. Wood pellets (tonnes)
11. Wood waste (tonnes)
12. Biogas (1000 Nm<sup>3</sup>)
13. Bio oil (tonnes)
14. Heat pumps (TJ)

#### Converted types of energy

1. Electricity (GWh)
2. District heat (TJ)
3. Gas works gas (1000 Nm<sup>3</sup>)

Information in physical quantities (specific units) is referred to as use of fuels whereas the consumption of energy measured in the energy unit joule is referred to as consumption of energy in heating values.

## 2.2 Classification system

The consumption of energy is broken down by the national accounts industry classification, which is based on the Danish industry classification from 2007. The Danish industry classification is based on NACE rev. 2.

## 2.3 Sector coverage

All sectors in the economy are covered by the statistics.

## **2.4 Statistical concepts and definitions**

**Basic Price:** Basic prices are for domestic production defined as the price ex factory, excl. of product taxes, net. For imports, they are the c.i.f. prices, i.e. the prices of the products at their arrival in Denmark, incl. transport and insurance expenses.

**Net Energy Consumption:** The production of electricity, district heat and town gas is based on inputs of other types of energy and are named converted types of energy. A direct aggregation of each energy commodity calculated into joule would therefore result in a double counting, because the content of energy in the converted types of energy already is represented in the power plants use of first and foremost coal, oil and natural gas.

In practice, the calculation of the net energy consumption is carried out by dividing the use of primary energy (e.g. coal, crude oil and natural gas) used in the production process at the electricity plants and district heat plants proportionately on the users of the individual converted energy commodities. Simultaneously, the use of primary energy in the conversion industries is reset to zero.

The conversion process involves a considerably loss of energy (the conversion loss). Therefore, the total energy content used in the production process is allocated to the final users of energy in the calculation of the net energy consumption

Furthermore, the electricity power plants consumption of energy is adjusted for the net imports of electricity, implying that this is also converted into primary energy.

**Energy Taxes:** The energy taxes include taxes on petrol, electricity, certain oil products, coal and natural gas. In addition to this, the CO<sub>2</sub>-tax, the SO<sub>2</sub>-tax and the NO<sub>x</sub>-tax is also accounted for. The SO<sub>2</sub>-tax is also paid for the use of straw and waste used as fuel at larger power plants.

**Purchasers' Prices:** The purchasers' prices are the price actually paid by the purchaser for a product, i.e. the market price. Consequently, this price may, in addition to the factory price of the product, include costs for transportation, trade margins, commodity tax and VAT.

## **2.5 Statistical unit**

The statistical unit is the local kind-of-activity unit, enterprise.

## **2.6 Statistical population**

All the units engaged in Danish economic activity.

## **2.7 Reference area**

Denmark.

## **2.8 Time coverage**

1966-2012

## **2.9 Base period**

Not relevant for this statistics.

## **2.10 Unit of measure**

Energy accounts in quantities are measured in tons, m<sup>3</sup>, GWh. In common units the measurement is done in joule. Monetary energy accounts are measure in mio. kr.

## **2.11 Reference period**

The reference period of the figures in the energy accounts is the calendar year.

## **2.12 Frequency of dissemination**

Annually.

## **2.13 Legal acts and other agreements**

No data are collected directly from the respondents.

Necessary for the calculations in the National Account, Council Regulation 2223/96.

## **2.14 Cost and burden**

There is no direct response burden as the data are collected by others (see sources).

## **2.15 Comment**

A general documentation of the Danish national accounts is available in "Danish National Accounts - Sources and Methods 2003", June 2007.

## **3 Statistical processing**

Energy accounts are compiled using a method of product balancing. Supply and use of each energy product are compiled in a way to ensure their equality and are balanced by utilizing all the relevant information from the available sources.

### **3.1 Source data**

The energy accounts are compiled on the basis of a number of sources.

Statistics Denmark's external trade statistics are used to decide the imports and exports of energy commodities. Statistics Denmark's production statistics are used to decide the production of certain energy commodities, e.g. petrol, gas oil and fuel oil.

Statistics Denmark's census of the manufacturing industries consumption of energy is used as the source for the manufacturing industries consumption of energy.

The calculation of the consumption of fuel oil bunkered by Danish operated ships abroad as well as jet petroleum bunkered by Danish planes abroad is based on information obtained from the balance of payments on the companies' expenses for fuel oil and jet petroleum. The physical quantities are calculated by using information from the external trade statistics on the relevant unit price. The Danish operated fleet includes ships and planes owned by foreign companies Danish subsidiary companies. On the other hand, ships and planes owned by Danish companies foreign subsidiary companies are not included, because they are included in other countries energy accounts.

Information about the industrial companies' reimbursement of energy taxes is used as a source in the calculation of the consumption of electricity, natural gas, gas oil and fuel oil within parts of the commercial and service sector.

Data from the Danish Energy Authority is used to decide the different inputs of energy in the energy sectors, i.e. production of electricity and heat. The statistics include input at the large-scale and small-scale power units and district heating plants. Furthermore, information from the Energy Authority on the consumption of energy in agriculture, horticulture, fisheries, and construction as well as private consumption (the households) is used as a source to the physical use of energy. In addition to this, a series of other sources is used to determine the specific values.

Information about the production of crude oil and natural gas in volumes as well as monetary values is also obtained from the Danish Energy Authority.

The trade margins are calculated as a percentage of the basic price. The trade margins are based on the trade margins in the national accounts.

The calculation of the taxes is based on the consumption of energy commodities in physical quantities as well as commodity specific tax rates. This is a natural consequence of the fact that the energy taxes as well as the CO<sub>2</sub>- and SO<sub>2</sub>-taxes are taxes on the actual physical quantities used. In the breakdown of the taxes, the existing law on reimbursement as well as other specific legal exceptions are taken into account. Finally, the system is balanced to the actual net revenue for the individual tax.

VAT is calculated as the last price level before aggregation into purchasers' prices. As with the calculation of the taxes, the calculation of VAT is net, because VAT-registered companies have the right to deduct VAT whereas households and non-VAT registered industries in the end pay VAT. It is the same industry specific basis for the distribution used in the calculation of the breakdown of the taxes, which is used in the calculation of the breakdown of the payment of VAT.

### **3.2 Frequency of data collection**

The data is collected by others (see sources).

### **3.3 Data collection**

Not relevant for this statistics.

### **3.4 Data validation**

A variety of sources are involved in the compilation of energy accounts. Verification of the external consistency of data between the data sources is part of the quality control in the process of compilation of the energy accounts.

### **3.5 Data compilation**

Not relevant for this statistics.

### **3.6 Adjustment**

No corrections, apart from the already mentioned under the validity and data processing, is undertaken.

## **4 Relevance**

Not known for this statistics.

### **4.1 User Needs**

The energy accounts are used by ministries, governmental agencies and organizations as a part of the surveillance of measures in the field of energy policy, including the surveillance of the development in the level of energy taxes. In addition to this, the energy accounts are used as a part of the basis for the macro economic model EMMA, which is a satellite model to the ADAM model. Within Statistics Denmark, the energy accounts are used as basis for a part of the supply use tables of the national accounts and as basis for the compilation of the air emissions accounts (e.g. CO<sub>2</sub>), which are published as a part of Statistics Denmark's environmental accounts. Finally, the energy accounts are used as basis for input-output model based analyses.

### **4.2 User Satisfaction**

Not known for this statistics.

### **4.3 Data completeness rate**

Data is complete.

## **5 Accuracy and reliability**

The calculation of energy consumption in some industries is very accurate thanks to censuses whereas the figures for other industries, because they are calculated are less accurate.

Statistical inaccuracy estimates do not exist.

### **5.1 Overall accuracy**

The overall accuracy can be regarded as good as far as the information on overall supply and use of energy products is concerned. Generally the uncertainty is bigger when it comes to information on the energy use of specific energy products by the individual industries. For some industries observations of the the energy use are available, while for others the information on energy use is based on estimations. In the latter case the accuracy is generally lower.

### **5.2 Sampling error**

Not relevant for this statistics.

### **5.3 Non-sampling error**

Not relevant for this statistics.

### **5.4 Quality management**

Statistics Denmark follows the recommendations on organisation and management of quality given in the Code of Practice for European Statistics (CoP) and the implementation guidelines given in the Quality Assurance Framework of the European Statistical System (QAF). A Working Group on Quality and a central quality assurance function have been established to continuously carry through control of products and processes.

### **5.5 Quality assurance**

Statistics Denmark follows the principles in the Code of Practice for European Statistics (CoP) and uses the Quality Assurance Framework of the European Statistical System (QAF) for the implementation of the principles. This involves continuous decentralized and central control of products and processes based on documentation following international standards. The central quality assurance function reports to the Working Group on Quality. Reports include suggestions for improvement that are assessed, decided and subsequently implemented.

### **5.6 Quality assessment**

The overall data quality is regarded as good.

### **5.7 Data revision - policy**

Statistics Denmark revises published figures in accordance with the [Revision Policy for Statistics Denmark](#). The common procedures and principles of the Revision Policy are for some statistics supplemented by a specific revision practice.

### **5.8 Data revision practice**

Most of the data do not change, but differences can be seen between the provisional and final data.



## **6 Timeliness and punctuality**

High punctuality.

### **6.1 Timeliness and time lag - final results**

The statistics are published annually approx. one year after reference period.

### **6.2 Punctuality**

The statistics are usually published according to the schedule.

## **7 Comparability**

The energy accounts from 2008 and onwards are based on data sources based on the Danish Industry Classification of All Economic Activities 2007 (DB07), whereas the accounts for the years from 1966-2007 are based on calculations on an older set of accounts. In the calculations it has been attempted to make the necessary adjustments in order to comply with new industry classifications.

### **7.1 Comparability - geographical**

The statistics follows international standards and has a high degree of comparability with other international statistics that follow the same acknowledge international principles.

### **7.2 Comparability over time**

The energy accounts are available in a comparable form back to 1966, which allows for consistent time series analysis. The energy accounts from 2008 and onwards are based on data sources based on the Danish Industry Classification of All Economic Activities 2007 (DB07), whereas the accounts for the years from 1966-2007 are based on calculations on an older set of accounts. In the calculations it has been attempted to make the necessary adjustments in order to comply with new industry classifications. In relation to the publication of the energy accounts 20 November 2013 the energy accounts have been revised. During the revision process emphasis has been put on ensuring comparability and consistency over time.

### **7.3 Coherence - cross domain**

The energy accounts are based on the same definitions and classifications as the national accounts.

With the revision of the energy accounts a new allocation of the production of electricity and district heat has been introduced. Electricity is now produced by 350010 Production and distribution of electricity and by 383900 Sewerage; waste collection, treatment and disposal activities etc. District heat is produced by 350010 Production and distribution of electricity, 350030 Steam and hot water supply, and by 383900 Waste management and materials recovery.

Other energy statistics, for instance the Danish Energy Authority's energy statistics accounts for the consumption of energy, which can be classified by both Danish residents as well as by non-residents within the Danish territory. The Danish Energy Authority's energy statistics is based on the guidelines from the International Energy Agency (IEA).

Compared to other energy statistics this implies that the energy accounts based on the national accounts principles also include the consumption of energy caused by international transport activities carried out by Danish residents. That is, transport activities carried out by Danish residents between a Danish (air)port and a foreign (air)port and the transport activities carried out by Danish residents between foreign (air)ports. Also diesel refueled abroad by Danish companies for land transport are included in the energy accounts.

In other words, the energy accounts include the consumption of energy bought by Danish operated ships and planes in foreign ports and airports.

### **7.4 Coherence - internal**

Internal data consistency is relatively good.

## **8 Accessibility and clarity**

Current publication: News from Statistics Denmark and Statistical News.

Annual publications: Statistical Yearbook, Statistical Ten-Year Review

Statbank:

- ENE1HO
- ENE1HT
- ENE1HA
- ENE2HO
- ENE2HT
- ENE2HA
- ENE3H
- ENE4HO
- ENE4HT
- ENE4HA

Website: [www.dst.dk/inputoutput](http://www.dst.dk/inputoutput)

### **8.1 Release calendar**

The publication date appears in the release calendar. The date is confirmed in the weeks before.

### **8.2 Release calendar access**

The Release Calendar can be accessed on our English website: [Release Calendar](#).

### **8.3 User access**

Statistics are always published at 8:00 a.m. at the day announced in the release calendar. No one outside of Statistics Denmark can access the statistics before they are published.

### **8.4 News release**

[NYT][<https://www.dst.dk/da/Statistik/emner/energi/energiregnskab.aspx?tab=nog>]

### **8.5 Publications**

#### **8.6 On-line database**

ENE1HO ENE1HT ENE1HA ENE2HO ENE2HT ENE2HA ENE3H ENE4HO ENE4HT ENE4HA

#### **8.7 Micro-data access**

Data are stored at Statistics Denmark.

#### **8.8 Other**

Not relevant for this statistics.

#### **8.9 Confidentiality - policy**

Not relevant for this statistics.

#### **8.10 Confidentiality - data treatment**

Not relevant for this statistics.

#### **8.11 Documentation on methodology**

A general description of environmental accounts and national accounts is available in the "System of Environmental-Economic Accounting Central Framework". (White cover publication). United Nations et. al. 2012".

## **8.12 Quality documentation**

Results from the quality evaluation of products and selected processes are available in detail for each statistics and in summary reports for the Working Group on Quality.

## **9 Contact**

The administrative placement of this statistics is in the division of National Accounts. The person responsible is Anna Andriianets, tel. 3917 3066, e-mail: ana@dst.dk

### **9.1 Contact organisation**

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