STATISTICS DENMARK

Documentation of statistics for Energy consumption in manufacturing industries 2022

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1 Introduction

The purpose of energy census for the manufacturing industry is to analyze volume and composition of the energy consumed by the manufacturing industry.

Data on energy consumption by manufacturing industry is provided bi-annual from 1980 and latest 2016, 2018, 2020 and 2022.

2 Statistical presentation

The energy census for the manufacturing industry covers all work units in industrial companies with at least 20 employees. That is equivalent to approximately 90 per cent of the energy consumption by manufacturing. It covers in principle the consumption of all energy sources in the production excl. external transport.

2.1 Data description

The overall objective of the statistic is to measure the energy consumption and use in connection by type within manufacturing. Furthermore, it is possible to shed light on the composition of different energy species, development in energy efficiency etc.

The statistics cover all production units (local units) within the industrial sector belonging to companies with at least 20 employees. Figures for enterprises with less than 20 employees are not estimated. The statistics is therefore referred to as a cut-off statistic (cut-off limit at 20 employees measured at enterprise level). The target population and the frame population are the same.

Next to the consumption of energy, related information is collected, in example from 2020 information on heat pumps were collected.

2.2 Classification system

The type of industries follows the European standard, NACE rev. 2, which is comparable with the Danish classification DB07.

2.3 Sector coverage

The statistics mainly covers the manufacturing sector, but also NACE 08 and 09

2.4 Statistical concepts and definitions

Energy Product by Type: To be reported are total energy consumption by type measured in quantity and the connected value.

2.5 Statistical unit

The unit of results for publication is aggregated results based on data for the local unit (/production unit). The different classifications (i.e. type of industry and geography) used for publication are connected to the local units.

2.6 Statistical population

The statistics cover all production units (local units) within the manufacturing sector belonging to companies with at least 20 employees. The type of industry uses the Danish classification DB07, which is comparable with NACE rev. 2, at a 2-digit level.

The population does not only cover the industrial sector (2-digit DB07 10-33), but also include some part of mining and quarrying (2-digit DB07 08-08)

2.7 Reference area

Denmark

2.8 Time coverage

Data on energy consumption by manufacturing industry is provided bi-annually from 1980 and latest for 016, 2018, 2020 and 2022

2.9 Base period

Not relevant for these statistics.

2.10 Unit of measure

Energy consumption by energy species are converted to Giga Joule (GJ) for publication.

The statistics contains the following types of energy for which consumption and costs are collected:

Electricity:

- Use/Purchase of electricity (kWh)

District heating and cooling:

- Purchase of district heating (GJ/m3/MWh)
- Purchase of district cooling (GJ/MWh)

Gas:

- Liquid gas products (LPG, LNG, refinery gas e.g. bottled gas (tonnes)
- Natural gas (m3) - incl. bio-produced
- Town gas (m3)
- Biogas (m3)

Liquid fuel:

- Benzin for vehichles in production (m3/1000l),
- Gas oil and other diesel oil products (m3)
- Heavy fuel oil (tonnes)
- Petroleum coke (tonnes)

Solid fuel:

- Hard coal (tonnes)
- Furnace coke, coke and brown coal (tonnes)
- Wood pellets (tonnes)
- Wood chips (tonnes)
- Wood waste incl. own produced (tonnes)
- Other waste incl own produced (tonnes)
- Other fuels (tonnes)

Information about use of energy is collected as percentages by type of energy. From 2020 more detailed information are requested from larger users of energy

2.11 Reference period

Purchase/use in the census year or closest accounting year.

2.12 Frequency of dissemination

Consumption of energy by the manufacturing industry is published every two years.

2.13 Legal acts and other agreements

The information is collected in pursuance of the Act on Statistics Denmark (Lov om Danmarks Statistik), cf. Order no. 610 of 30 May 2018

Further Regulation (EU) Nr. 691/2011 on environmental accounts apply as well as a full energy account has to be produced

2.14 Cost and burden

Total costs associated with reporting was 784000 Kroner (DKK) in 2020, based on an estimate.

2.15 Comment

Other information is not available.

3 Statistical processing

There is a comprehensive validation of data, to ensure that the consumption is recorded in the correct unit. Further comparison with latest year is part of the validation.

When the reported data have passed the quality checks, they are prepared for needed imputation. Imputation is only carried out for for non-responding units and missing information

3.1 Source data

The energy census for the manufacturing industry, is a primary source, which means that data is formed in this census.

3.2 Frequency of data collection

Information on the consumption and use of energy is collected every two years.

3.3 Data collection

The statistics is conducted as a web-based questionnaire. More information on: [Reporting] (https://www.dst.dk/da/Statistik/emner/energi/energiforbrug.aspx

Information on the data collection is available (in Danish) at Indberetning

3.4 Data validation

The two primary sources of inaccuracy in the statistics are:

- Reports containing errors, in particular on the energy unit. These error re found be comparing with the costs.
- Typing mistakes when data are entered. Such errors is mainly detected by comparing with data for previous years

At the time of typing, all data go through liability checks. These consist of comparisons of consumption and the related costs. By this many unit-errors are avoided.

After that follows a more detailed error-seeking process where data are checked thoroughly by using the general tools and methods in Statistics Denmark, in particular comparing with earlier data for the working place

or the few enterprises having quotas for CO2, The Energy Agency collects particular information which since 2018 are available in the data validation.

All discovered discrepancies are checked and corrected by contacting the involved companies.

3.5 Data compilation

When the reported data have passed the quality checks, they are prepared for needed imputation. Imputation is only carried out for for non-responding units, and uses a stratified approach.

The results are compiled by adding up by groups.

The response rate is high - nearly 99 percent.

The energy consumption are for all types of energy compiled in GJ (GigaJoule), using actual keys for compiling.

3.6 Adjustment

There are no further corrections

4 Relevance

The results from the energy census are used by Statistics Denmark to compile energy balances that are used in the national accounts.

Furthermore, the parties involved in energy planning, for instance municipalities, counties, the Energy Authority and affected supply companies, need the information.

A number of industrial associations, private companies and research institutes have also expressed an interest in the results. Furthermore, the energy census is used for energy statistics compiled by the International Energy Agency (IEA).

4.1 User Needs

The results from the energy census are used by Statistics Denmark to compile energy balances that are used in the national accounts, including environmental accounts. Furthermore, the parties involved in energy planning, for instance municipalities, counties, the Energy Authority and affected supply companies, need the information.

A number of industrial associations, private companies and research institutes have also expressed an interest in the results.

4.2 User Satisfaction

In general, public authorities as well as private companies are very satisfied with the statistics on energy consumption.

4.3 Data completeness rate

Results published are in line with guidelines.

5 Accuracy and reliability

In general the quality of the statistics is good - especially main figures which builds on aggregates.

At a more detailed level, the results are more uncertain, mainly due to measurement errors.

5.1 Overall accuracy

Since all units in the population for manufacturing industry is covered by the census the overall reliability of the final results is estimated to be very high and consistent with the actual consumption.

Insecurity derives mainly from undetected errors in the collected data, in example if types of energy are missing in the reporting.

5.2 Sampling error

Not relevant, since the reporting units cover all units in the frame.

5.3 Non-sampling error

Uncertainty is mainly connected to measurement errors.

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

In general the quality of the statistics is good.

Since the reporting units cover the entire population frame, the sampling errors are eliminated. On the other hand, the statistics is affected by other errors, mainly measurement errors.

The two primary sources of inaccuracy in the statistics are:

- Reports containing errors
- Typing mistakes when data are entered

Error reporting are addressed in the liability checks, which ensure a good data quality.

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

Only final figures are produced and there have been no revisions recently.

6 Timeliness and punctuality

Results are published no later than 8 months after the end of the reference period.

6.1 Timeliness and time lag - final results

Results are published no later than 8 months after the end of the reference period in a news article.

6.2 Punctuality

The statistics are usually published without delay in relation to the scheduled data.

7 Comparability

Data on energy consumption by manufacturing industry is provided from 1980 and the concept has almost been kept since.

Time series can be found in The Statbank for the years since 2012.

7.1 Comparability - geographical

The results from the energy census are used by Statistics Denmark to compile energy balances for the whole economy. The results can be compared to other countries results.

7.2 Comparability over time

The energy census has been carried out since 1980 and the structure has overall been kept.

In 2018 new energy types was included in the questionnaire. May have impact on backwards comparability

In 2020 new and more detailed use categories has been introduced

7.3 Coherence - cross domain

Direct comparable statistics are not available. The development in the use of energy can be related to economic results, in example by type of industry.

7.4 Coherence - internal

Not relevant for these statistics, as all results derive from the same source

8 Accessibility and clarity

Results are published in a news article in august every two years.

Furthermore, some figures will be available through the Stat bank at StatBank.

More information are available on the website: Subject.

By request, Statistics Denmark do client work. Researchers have the opportunity to get access to anonymised micro-data.

8.1 Release calendar

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

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.

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8.2 Release calendar access

The Release Calender can be accessed on our English website: Release Calender.

8.4 News release

The latest publication can be viewed at: News.

8.5 Publications

The results are only available in a news article and in the Statbank.

8.6 On-line database

Total energy consumption by municipality, by type of industry and by energy source for 2012-2022: See Energyuse.

8.7 Micro-data access

Researcher have the opportunity to get access to anonymised micro-data.

8.8 Other

The main figures are important input to the general energy balances, which are developed under the environmental national account system.

8.9 Confidentiality - policy

In the compilation of the statistics, the confidentiality policy of Statistics Denmark is followed.

8.10 Confidentiality - data treatment

In the compilation of the statistics, the confidentiality policy of Statistics Denmark is followed.

8.11 Documentation on methodology

Not relevant for these statistics.

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 these statistics are in the division of Research, Technology and Cultures. The person responsible is Ole Olsen, tel. +45 39 17 38 63, e-mail: olo@dst.dk

9.1 Contact organisation

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N/A