

Energy Statistics *Newsletter*

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Statistics Finland's experiences in electronic data collection in energy use in manufacturing

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Statistics Finland has worked on the development of Internet data collection for over ten years. The objective of Internet data collection is to increase the efficiency and improve the quality of statistical work. An Internet form has also been adopted in the survey on energy use in manufacturing which was implemented for the first time in 2007. Since then, the form has been improved on several occasions: for instance, based on user feedback and various users' surveys. Already in the first year that the Internet questionnaire was implemented, the share of respondents using the on-line questionnaires was 87 per cent. Now, 94 per cent of the responses to the survey on energy use in manufacturing are received through the Internet questionnaire with a non-response rate of around 16 per cent.

An electronic questionnaire makes statistics production more efficient

Electronic data collection enables a more efficient statistical production process in many ways. When the data are received already in electronic format, their transfer to the internal information system/database is more efficient and does not require manual storing or data entry. This is certainly the main and most obvious reason for the process becoming more efficient.

There are also other advantages in using an electronic form. From the beginning in Statistics Finland, pre-filled data and checking rules were added to the Internet form in order to improve the quality of the answers. (It should be noted that the pre-filled data option does not differ from the paper form; pre-filled data, like the enterprise's contact information, can be added to the paper form as well.) In addition, checking rules can be added to the response fields of the electronic form, as well as a requirement that mandatory fields are filled in. A number of checking rules can be used: for example, a check for missing data; a check that the data are not negative; or a check if there are large changes when compared with data from the previous

years, in which case the respondent can be asked for a confirmation or an explanation for the large change.

The electronic questionnaire also enables conditional branch questions where the respondent is asked a subsequent question based on the first answer.

The electronic form can also be tailored based on the data supplier so that each data supplier is only asked for data that cannot be obtained from administrative files or based on other inquiries.

Overall, the aim of these functionalities is to reduce the possibility of human errors, improve data quality and reduce the response burden.

The Internet questionnaire has developed considerably since 2008

The Internet form is very different in nature than the paper form. It brings new opportunities to questionnaire design but also challenges. During the first few years, the Internet form was developed based on feedback and user experiences. A more extensive survey on the usability of the form was carried out in 2012.

The usability survey was conducted by visiting three voluntary enterprises that represented different types of respondents. The purpose of the enterprise visits was to observe the response process and to interview the data suppliers. In practice, the data supplier answered the inquiry on energy use in manufacturing using a laptop provided by the interviewer that recorded everything that was said and done with the computer. The interviewers also asked the respondents to say out loud what they were thinking about during each question and to mention any difficult or unclear sections.

The recoding of the enterprise visit was analysed at Statistics Finland and, based on this, a plan for the further development of the Internet questionnaire was made. Based on these experiences and the development plan, the Internet questionnaire is now being developed further to make it as user friendly as possible.

Reducing the response burden is the future challenge

While the Internet questionnaire makes the statistical production process more efficient, it does not reduce the response burden much. In 2009, Statistics Finland conducted a response burden study according to which responding to the inquiry on energy use in

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manufacturing takes on average 2 hours 9 minutes per enterprise. The need for statistical data grows but the number of inquiries or their extent cannot be expanded infinitely. A future challenge for statistical authorities is to ponder how the response burden can be reduced. Statistics Finland has tested and adopted so-called automated reporting in a few areas of statistics. This means that the data provider can report the data requested by Statistics Finland from their own information system through a programme which automatically collects data required by Statistics Finland and sends the data to Statistics Finland directly. The enterprise manages and confirms the creation and sending of the file in accordance with Statistics Finland's specifications. All of this is done through an automated programme, so the response burden is low regardless of the size of the file. A precondition for this is naturally that the required data are saved in the enterprise's information system. If all requested data are not saved in the enterprise's information system the enterprise can fill in missing information manually before sending the file.

Automated data collection has been presented, for example, at the Q2012 conference (European Conference on Quality in Official Statistics): http://www.q2012.gr/articlefiles/sessions/27.2_Konttinen_Accommodation_statistics.pdf

You can learn more about Statistics Finland's inquiry on energy use in manufacturing at: http://www.stat.fi/keruu/teen/index_en.html.

Data Dissemination in the UK

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UK

The UK Department of Energy and Climate Change (DECC) is responsible for producing and publishing energy, efficiency and emission statistics for the UK. DECC and its predecessor departments (Ministry of Power; Department for Trade and Industry) have been publishing energy statistics for a long time, with some coal data available from the 19th century. In July 2013, as usual, DECC published its Digest of United Kingdom Energy Statistics (DUKES). This annual publication was first published as a stand-alone statistical product in 1950. The publication has, of course, changed significantly over this period. In the earliest editions half the pages concerned coal, whilst in the latest edition this had fallen to around 10% as the UK now uses a much broader range of fuels.

As part of the Energy Ministry, statisticians in DECC face both advantages and disadvantages when comparing our situation against those in other countries, for example where statistics are produced by a central statistical office. The main advantage is that statisticians in DECC are closely linked to policy colleagues, so are perhaps more in tune with the data needs of key users, as well as being better able to influence administrative systems being developed by the Department so they can be used for statistical purposes. The main disadvantage is the lack of access to wider data that a National Statistics Institute would have available. A code of practice for all UK government statistics, as discussed later in this article, helps to build trust that the statistics are produced impartially and are not influenced by political concerns, with a timetable published of future statistical releases.

DECC's main energy statistics publications

Apart from DUKES, mentioned above, DECC publishes a wide range of statistical data covering a broad range of energy statistics. Key energy aggregates, such as energy production and primary energy consumption, are published on a monthly basis – with the data available around 8 weeks after the end of the reference month. DECC chooses to publish data on the last Thursday of a calendar month – so on November 28th 2013, DECC released data for activity that happened in September 2013. Data are broken down by fuel, and more detailed data are also published on the fuels used in electricity generation including renewables with demand shown by sector for electricity. These estimates are compiled from a wide range of sources; specific surveys of energy suppliers as well as administrative systems. More detailed surveys are conducted on a quarterly basis, and DECC publishes a full range of quarterly statistics on the last Thursday of a quarter – with data supplied with a lag of around 12 weeks, along with articles focussing on aspects of energy, for example, on energy security, renewables etc. Even more detailed surveys are run on an annual basis and are used to help compile DUKES, which is published each July.

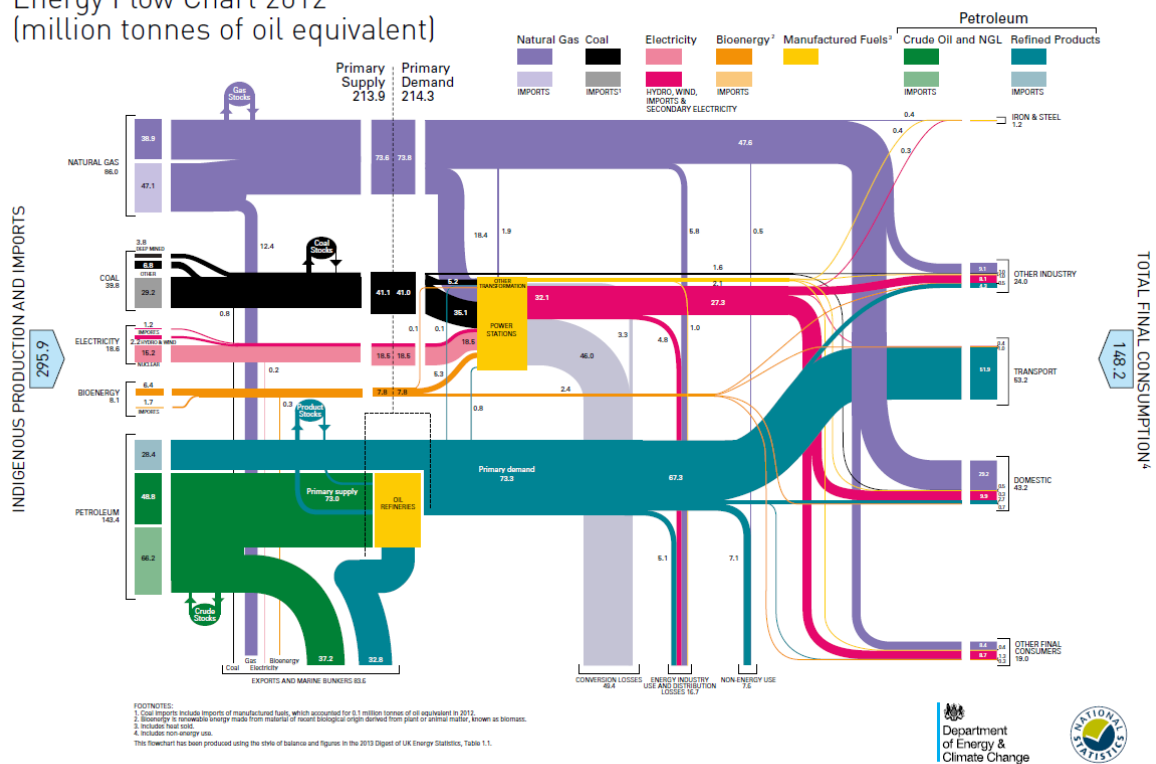
DECC publishes price statistics on a monthly and quarterly basis, with series on prices paid for the main fuels used by sector. International comparisons, with data sourced from Eurostat and the IEA, are regularly published so that an assessment can be made of UK prices compared to those in other economies. DECC also publishes weekly data on petrol prices.

Additionally, DECC publishes a number of annual energy statistics publications that generally provide a

wider view of energy statistics looking, for example, at the drivers of consumption. These include Energy Consumption in the UK which brings together statistics from a variety of sources to produce a comprehensive review of energy consumption, including changes in efficiency, intensity and output since 1970. UK energy sector indicators are also published annually, which includes over 100 charts providing information on: the contribution of energy to the economy; energy reliability, with data on resources, diversity and utilisation; energy prices and competition; and environmental objectives. Alongside DUKES, DECC

publishes two companion documents: UK Energy in Brief – a small booklet that summarises the latest statistics published in DUKES; and Energy Flow chart, which provides a pictorial summary of the UK energy balance for the latest year. This document illustrates the flow of energy from the point it becomes available from domestic production or imports (on the left below) through transformation activities (coal and gas becoming transformed into electricity) to their eventual final use (on the right hand side).

Energy Flow Chart 2012
(million tonnes of oil equivalent)



Timing of releases

DECC aims to publish as soon as data are available. Data are made available to all users at the same time. The slight exception to this is that pre-release access is granted to around eight people, including DECC Ministers, who will see the publication 24 hours prior to release. Pre-release access in DECC is strictly limited, as this has a slight negative impact on perceptions that the data published are free from political interference. The list of those who receive the data early is published on the DECC web site. Those

with pre-release access are not allowed to influence the data published – but can receive briefing regarding points of interest, so that they are able to answer questions on the data when they are in the public domain.

National Statistics

DECC’s statisticians form part of the Government Statistical Service, and DECC’s energy statistics are published according to the UK Statistics Code of Practice. The key relevant factors from this are:

- Responsibility for statistical methods and outputs resides with the Statistics Head of Profession (rather than Ministers)

- Presentation and commentary should be: impartial; clear; balanced; made available to widest possible audience; with the content reviewed regularly

- Accessibility, taking account of user needs; provide underlying data (subject to confidentiality)

- Pre-release access: restrict access to data prior to publication; report breaches of the code

- Publication follows published timetable; 12 months in advance

(<https://www.gov.uk/government/publications/statistical-releases-timetable-for-2013>)

- Make metadata available

DECC statisticians ensure that they adhere to the code in producing energy statistics. Each year a report is sent by the DECC statistics head of profession to the National Statistician to confirm adherence, with procedures audited, on roughly a triennial basis, by the UK Statistics Authority.

Paper versus web

DECC currently publish DUKES, Energy in Brief and the Energy Flow Chart as hard copy printed documents each July. Also Energy Trends and Quarterly Energy Prices (QEP) are printed and sent to those who have taken out a subscription for the journals, on a quarterly basis. All information however, is available for free on the DECC web site, alongside methodology notes and survey forms. The home page has links to excel data files as well as PDF versions of printed reports (<https://www.gov.uk/government/organisations/departme-nt-of-energy-climate-change/about/statistics>).

In general DECC is more and more focusing on web dissemination as our primary method for data dissemination.

New media

DECC is currently expanding its use of newer media channels. Key data releases will normally include a statistical press release. A recent example is at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/244831/pn_2013_095.pdf. DECC though is now looking at using more social media to alert users to our releases – including tweets from the main Departmental account. A recent example tweet: “Wind generation increased by 62 per cent - of which onshore wind generation rose by 70 per cent since a year ago”. Each quarter DECC tries to pick out the main

statistics of interest and use social media as a way of increasing the reach of the statistics.

User feedback

DECC aims to ensure that we meet the needs of our wide range of users. These range from internal policy makers, to journalists, academics and to the wider public. A questionnaire is put on the website – and sent to registered users on a biennial basis to gauge their views. DECC also actively listens to other feedback throughout the year to ensure that our outputs continue to meet user needs. Statistics on web hits are monitored on a monthly basis. In the past year there have been around half a million visits to the energy statistics web site. There is a regular pattern of visits, though when items become more newsworthy, there is a surge in web activity. In particular, domestic energy prices have recently been in the UK news, and this has resulted in four times the number of visitors to these pages. We are also active in our engagement with international organisations to promote comparability and the development of statistics to meet wider international needs.

As a result of the feedback DECC has now started to expand the details of renewables information published and also expanded publication of regional energy data.

Future developments

This article has concentrated on describing the current dissemination of DECC’s mainstream energy statistics products. Apart from these, the UK has produced statistics on emissions and fuel poverty for a number of years. The UK is currently developing more statistics based on management information, looking at energy efficiency and policy monitoring, with statistics on the number of homes being insulated, smart meters and small scale renewables. A major development is the creation of the UK’s National Energy Efficiency Data-Framework (NEED) (<https://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework>). The data framework matches gas and electricity consumption data, collected for DECC’s sub-national energy consumption statistics, with information on energy efficiency measures installed in homes, from the Homes Energy Efficiency Database (HEED). It also includes data about property attributes and household characteristics, obtained from a range of sources. This work within DECC provides us with a better understanding of energy use and energy efficiency in domestic and non-domestic buildings in Great Britain. Data from NEED is available on the DECC web site and

tools are provided to allow users to download data and produce their own tables.

For more information, please visit:

<https://www.gov.uk/government/organisations/department-of-energy-climate-change/about/statistics>.

The importance of natural gas statistics

UNSD

The importance of natural gas has increased in recent years and thus the need for detailed, high quality statistics on natural gas. This article describes the recent trends and challenges specific to natural gas statistics and recent activities at the international level in natural gas statistics.

Natural gas is considered one of the cleanest and most efficient fossil fuels and is thus becoming an increasingly important form of energy. The production and consumption patterns of natural gas are evolving both at the national and international level due to two main driving forces: natural gas is often a viable alternative compared with other fossil fuels because of its lower carbon content; and also, the availability of natural gas is plentiful, and expected to grow. Some examples of the most notable newer trends for natural gas are described below.

Increasing Consumption

In 2011, the consumption of natural gas was more than two thirds higher than in 1990; it is expected that it will further increase in the next 20 years. The International Energy Agency's World Energy Outlook 2013 contains forecasts of a 1.6 per cent annual increase in demand for natural gas from 2011 to 2035 (under the New Policies Scenario). While this trend is observed across all regions, it is particularly strong in Asia owing to the sharp increase in demand of China and India, and the Middle East.

The use of natural gas for power generation continues to increase, and that sector is expected to lead the demand for natural gas in most regions. Because of the higher thermal efficiency of some types of gas power stations, such as combined cycle gas turbines, natural gas presents definite environmental advantages over other fossil fuels, such as coal and oil (in addition to its already lower carbon content). With the strong growth of variable renewable power generation from wind and solar, this provides another reason for gas' future growth, as natural gas power plants are normally better suited for the variable operation necessary when supporting intermittent sources, and can be deployed in

small plants close to end-users due to natural gas' lower emissions of particulates, sulphur dioxide and nitrogen oxide.

While still very limited at present, the demand for natural gas as an input to gas-to-liquids plants is also expected to increase due to recent increases in capacity of such plants, which convert natural gas into liquid fuels as an alternative when crude oil inputs are unavailable or too expensive.

The final consumption of natural gas is expected to grow, especially in the industry sector. The use of natural gas as a road transport fuel, although still limited in terms of total final demand, is expected to grow in a number of countries. While that use is not likely to become significant on a global scale (in 2011 it amounted to about 1 per cent of the total supply of natural gas) since it requires the establishment of infrastructure and adaptation of vehicles to a different fuel, it is certainly a growing trend (increasing by over 200% since 2005) that needs to be accurately monitored. Finally, the consumption of natural gas in households and in commercial and public services is also expected to grow in selected countries. While for many developed countries the use of gas for water and space heating has reached a saturation point, a rapid growth in the use of gas in buildings is expected in other, mainly developing, countries.

Trade

In the past 20 years, there has been a steady increase in the trade of natural gas, partly due to the asymmetry between countries producing and using gas. The increase in liquefaction capacity has brought an increase in the trade of liquefied natural gas, which makes it possible to transport natural gas over long distances where pipelines do not exist. Once transported, liquefied natural gas is regasified and distributed as pipeline natural gas. The asymmetry between producers and consumers underlines the need for statistics from all countries, not just major producers, to be collected in order to obtain a complete picture of the production, trade and different uses of natural gas.

In terms of reserves/resources, the availability of natural gas in the environment is sufficiently abundant to cover global gas demands for many decades. While most of the reserves/resources consist of conventional gas, an increasing proportion constitutes unconventional gas, including shale gas, coal bed methane and tight gas.

Challenges specific to natural gas statistics

There are a number of data collection challenges specifically relating to natural gas compared with other areas of energy statistics; these are described below.

Measurement units

While there is international agreement that natural gas should be collected in volume units such as cubic metres and also in energy units such as joules, there are some elements that may affect the comparability of information, such as the temperature and pressure conditions under which the measurements are taken; the use of gross or net calorific values when converting physical to energy units; and the measurement point for the production of natural gas, for example dry versus wet output of processing plants, which may differ in certain countries. In addition, when natural gas is brought to a liquid form (liquefied natural gas), the measurements are generally taken in mass units rather than in volumetric units. This provides additional problems when presenting data in a common unit as figures in, for example, tons of LNG and cubic metres of natural gas have to be combined.

The *International Recommendations for Energy Statistics* (IRES) provide a number of recommendations on measurement issues, but there is a need to focus on the consistent application of the recommendations in order to ensure international comparability of the statistics.

Trade

In common with the trade statistics of other energy products, imports and exports of natural gas should exclude any natural gas in transit, which is not destined for consumption within the national territory. However, in practice, particularly in areas where there are complex pipeline systems with multiple entry and exit points and reversible pipes such as in Europe, identifying the final destination of gas deliveries can be challenging (it should be noted that when LNG is imported to be regasified and then exported (or vice versa) this should not be considered as goods in transit. In this case the import and export flows should be recorded as international trade).

Quantities reinjected, flared and vented

During the extraction of natural gas, some quantities of natural gas are either reinjected (to maintain well pressure), flared or vented (due to safety reasons or because necessary pipeline capacity is not available). While IRES recommends that the production of natural gas excludes these quantities – thus

representing the marketable production rather than the “wellhead” production - it is important to record these quantities, not only for understanding the production process, but especially to better estimate greenhouse gas inventories as the flared and vented quantities contribute to GHG emissions.

Overall statistics on natural gas are important not only in their own right but also because they are an input to a number of areas of statistics such as energy balances, the System of National Accounts (SNA), and the System of Environmental-Economic Accounting for Energy (SEEA-E), etc.. Improvements in the statistics’ quality, availability and consistency will in turn benefit the quality of these statistical outputs.

Current activities

Annual natural gas statistics are collected by a number of international and regional organizations, resulting in good coverage of countries’ annual natural gas transactions. Consistent implementation of the definitions and recommendations set out in IRES should further improve the comparability of different data sources.

The availability of monthly natural gas statistics varies considerably. Detailed monthly statistics are collected by the International Energy Agency (IEA) and the Statistical Office of the European Communities Eurostat as part of the monthly oil statistics questionnaire. Eurostat collects natural gas data from member states and candidate countries of the European Union for the past month (m-1) on a few key flows, namely primary production, imports, exports, stock changes, stock levels and calculated supply. In addition, Eurostat collects semestrial natural gas prices in the European Union at three levels of taxation and at various bands depending on the size of the industrial or household consumers. In 2007, the Asia-Pacific Economic Cooperation (APEC) began an experimental collection and publication of monthly data on natural gas production, consumption, trade and stocks. The United Nations Statistics Division collects monthly statistics on the production of natural gas through the Monthly Bulletin of Statistics. Some of the above-mentioned collections are based on legal directives, while others are carried out on a voluntary basis.

While there is increasing demand for short-term, detailed statistics on natural gas, the current situation shows a lack of detailed information on the supply and demand side on a monthly basis at the global level. This information is important in order to understand the

market, plan future supplies and demand, and take decisions on investments.

In response to the need for short-term, detailed natural gas statistics, UNSD together with APEC, Eurostat, the IEA, the Latin American Energy Organization (OLADE) and the International Energy Forum (IEF) and within the Joint Organisations Data Initiative (JODI) is collecting monthly statistics on production, imports, exports, stocks, stock changes and gross inland deliveries of natural gas. An increasing number of countries submit such monthly data.

A JODI Gas Manual is being prepared by the JODI organizations in support of the collection and compilation of JODI gas statistics. The manual - in line with IRES - further expands on specific issues related to the monthly collection of natural gas statistics. UNSD drafted the Manual in cooperation with the other JODI organizations.

This article is based on the Report on natural gas statistics to the United Nations Statistical Commission. For more information, please visit:

<http://unstats.un.org/unsd/statcom/doc12/2012-10-GasStats-E.pdf>

Update on Oslo Group Work

45th session of the Statistical Commission, 4 to 7 March 2014, United Nations Headquarters, New York USA.

One agenda item of the UNSC will be the report of the Oslo Group on Energy Statistics. The report presents a description of the activities undertaken by the Oslo Group during the period 2011-2013 - including a description of the preparation of the compilation guidance for energy statistics (the Energy Statistics Compilers Manual), the governance of the Oslo Group and the work plan for the Group's future activities.

With the adoption of IRES by the UN Statistical Commission, in February 2011, the activities of the Oslo Group focused in the past two years in the drafting of the Energy Statistics Compilers Manual (ESCM).

The past three meetings of the Oslo Group together with a Virtual meeting in April 2013 focused on the preparation and discussion of the ESCM chapters. Members of the Oslo Group volunteered to coordinate the drafting of the ESCM chapters, and the latest draft chapters that were discussed at the 8th Oslo Group meeting in Azerbaijan are available online.

The Chair and Secretariat of the Oslo Group was passed from Statistics Norway to Statistics Canada in March 2013. A new website was created for the Oslo Group which is now available at: <http://www.oslogroup.org>.

The work plan for the Group's future activities was discussed at the 8th Oslo Group meeting. The report to the UNSC provides a list of the future activities of the Group.

For more information, please visit:

<http://unstats.un.org/unsd/statcom/doc14/2014-23-OsloGroup-E.pdf>.

Editorial Notes

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