Department of Energy & Climate Change

Energy Consumption in the UK (2015)

Chapter 4: Industrial energy consumption in the UK between 1970 and 2014

30 July 2015

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Industrial energy consumption in the UK between 1970 and 2014

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Energy Consumption in the UK
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Background

This factsheet provides a brief overview of the trends and some key drivers that have influenced energy consumption within the industrial sector in the UK since 1970. Analysis is based on data from DECC's annual publication 'Energy consumption in the UK' published on Thursday 30 July 2015: https://www.gov.uk/government/publications/energy-consumption-in-the-uk.

This factsheet looks at the change in industrial energy consumption by the following sections:

- **Overall** industrial energy consumption in 2014.
- Industrial sector energy consumption by **fuel** between 1970 and 2014.
- Industrial sector energy consumption by **sub-sector** between 1990 and 2014.
- **Factors** affecting industrial energy consumption and energy intensities since 1990.

This factsheet also contains publication plans for each table and a summary of related DECC publications in the Annex.

Alongside the ECUK series of datasets and factsheets, a User Guide is also available which provides the reader with an overview of the content of each chapter within ECUK and explains technical concepts and vocabulary. The User Guide is not intended to offer commentary and interpretation of the data. We value feedback on the content of this factsheet and comments, or related queries, should be sent to EnergyEfficiency.Stats@decc.gsi.gov.uk.

Key terms used in this document

The following terms have been used frequently in this factsheet and the data tables and have been defined below in order to aid the unfamiliar user in fully understanding the statistics.

- **Primary energy equivalents** - this is the amount of the fuel used directly for consumption in a sector prior to any loss of energy via conversion or transformation process. Therefore, the primary energy equivalent estimates will include any losses incurred during the transformation process and energy used by the energy industry, and will differ from final energy consumption estimates.
- **Final energy consumption**– this refers to energy consumed by final end users after energy has been transformed, as opposed to primary energy consumption which is energy in its original state.
- **Non-energy use** – this category includes the consumption of energy products which have not been used directly to provide energy. This category includes use for chemical feedstock, solvents, lubricants and road making material.
- **Million tonnes of oil equivalent (Mtoe)** – this is a common unit of measurement which enables different fuels to be compared and aggregated. A tonne of oil equivalent (toe) is a unit of energy.

A full glossary of terms used within the energy industry has been provided in Annex B of the DECC statistics publication 'Digest of UK Energy Statistics' (DUKES)[1].

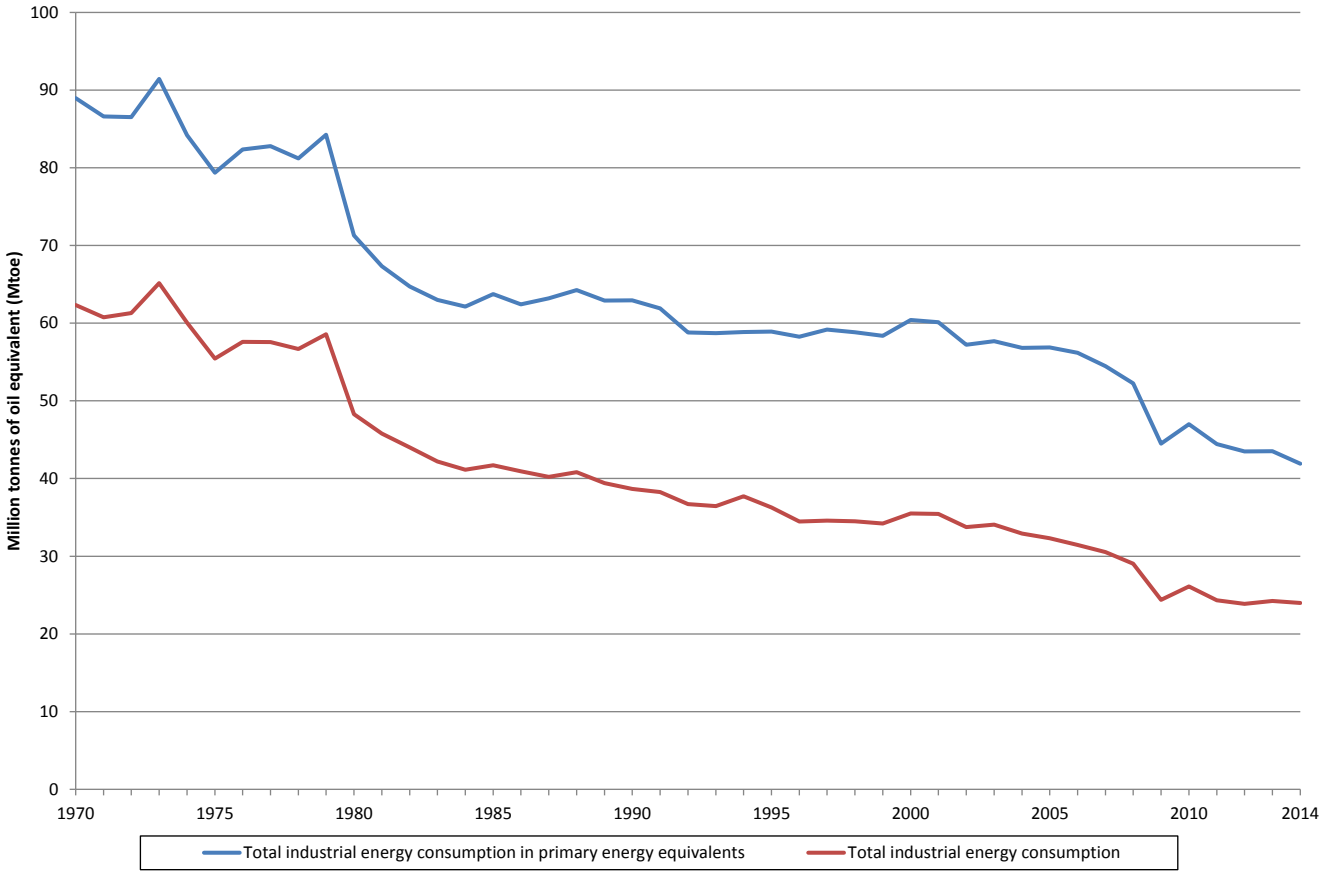
[1] DUKES can be accessed here: https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes.

1. Overall industrial energy consumption in 2014

In 2014, industrial energy consumption was 24.0 million tonnes of oil equivalent (Mtoe), 0.3 Mtoe (1 per cent) lower than in 2013, 14.7 Mtoe (38 per cent) lower than in 1990, and 38.3 Mtoe (62 per cent) lower than 1970. Industrial consumption accounted for 17 per cent of total UK final consumption of energy products in 2014.

In primary energy equivalents (that is, energy counted in its untransformed state), industrial consumption accounted for 41.9 Mtoe in 2014, 1.6 Mtoe (3.7 per cent) lower than 2013 and 47.1 Mtoe (53 per cent) lower than 1970. This reduction is driven by efficiency improvements in electricity generation, changes in the structural nature of the industrial sector and efficiency of final use in industry during the transformation of primary into secondary fuels for final consumption.

Chart 1 **Total industrial energy consumption, UK (1970 to 2014)**

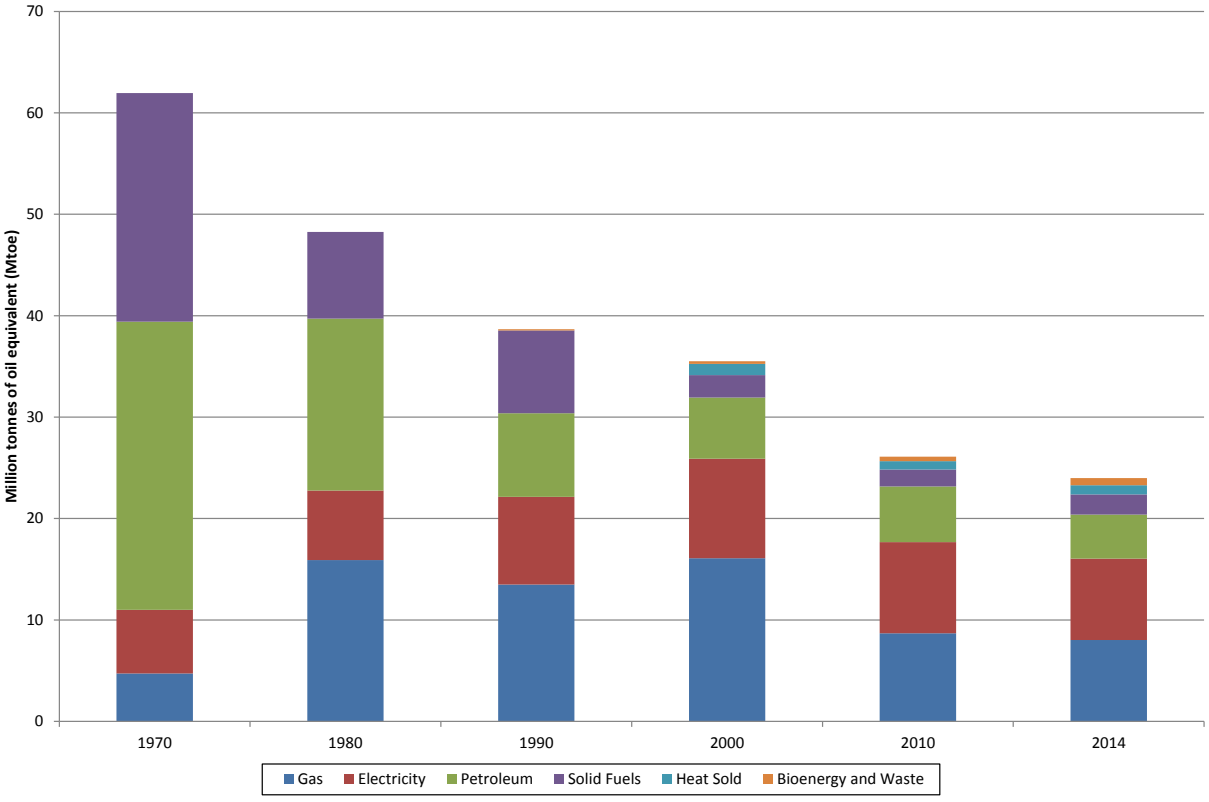


Source: DECC, ECUK Tables 4.01 & 4.02

2. Industrial sector energy consumption by fuel between 1970 and 2014

The fuel mix of the industrial sector has changed dramatically between 1970 and 2014, reflecting changes in the way that energy is used for different processes and sectors. Chart 2 shows the proportionate fuel use in the industrial sector since 1970.

Chart 2 **Industrial consumption by fuel, UK (1970 to 2014)**



Source: DECC, ECUK Table 4.02

The fall in consumption seen since 1970 is primarily due to less coal consumption (down by 88 per cent to 1.5 Mtoe), less coke and breeze consumption (down by 95 per cent to 0.5 Mtoe) and less petroleum consumption (down by 85 per cent to 4.3 Mtoe – instigated by high oil prices in the 1970s).

However, over this period, gas consumption (including blast furnace, coke oven, town and natural gas) increased from 4.7 to 8.0 Mtoe (with a peak at 15.8 Mtoe in 2000) and electricity use increased from 6.3 to 8.0 Mtoe (with a peak at 10.0 Mtoe in 2005).

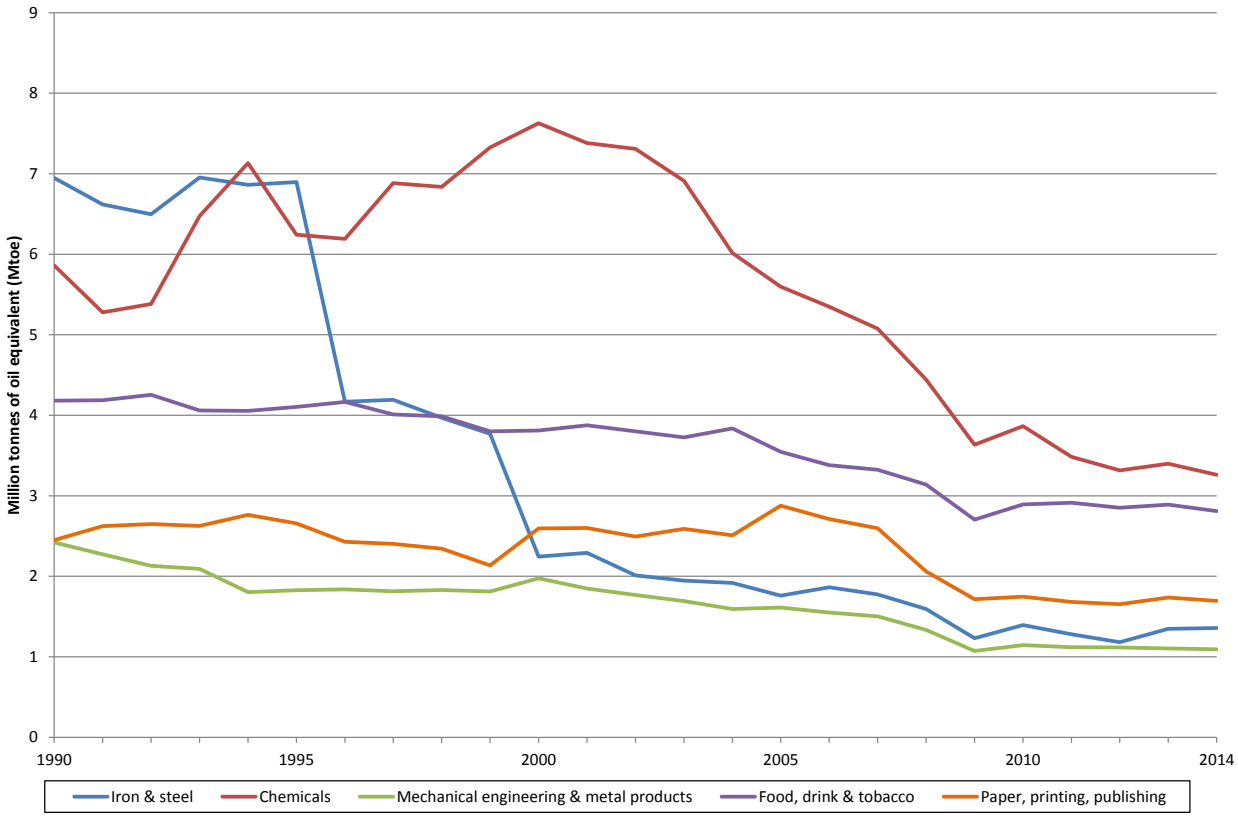
Electricity and gas together accounted for 67 per cent of industrial energy in 2014, compared with 13 per cent in 1970 and 56 per cent in 1990. Energy consumed for industrial transport purposes is excluded.

3. Industrial sector energy consumption by sub-sector between 1990 and 2014

In 2014, the largest consuming industrial sub-sector was the chemicals sector which was responsible for 3.4 Mtoe (14 per cent of total industrial energy consumption), followed by the food, drink and tobacco sector and the mineral products sector which both consumed 2.8 (12 per cent).

All industrial sub-sectors saw decreases, of varying levels, in final energy consumption between 1990 and 2014. The iron and steel sector saw the largest decrease in both absolute and percentage terms, falling by 80 per cent from 6.9 Mtoe in 1990 to 1.4 Mtoe in 2014. Over this period the iron and steel sub-sector saw its consumption falling from 18 per cent of total industrial energy consumption in 1990 to 5.7 per cent in 2014. The non-ferrous metals sub-sector had the second largest percentage fall at 56 per cent, reducing from 1.3 Mtoe in 1990 to 0.6 Mtoe in 2014. Chart 3 shows the changes in energy consumption across selected sub-sectors within the industrial sector.

Chart 3 **Industrial final energy consumption by sub-sector, UK (1990 to 2014)**

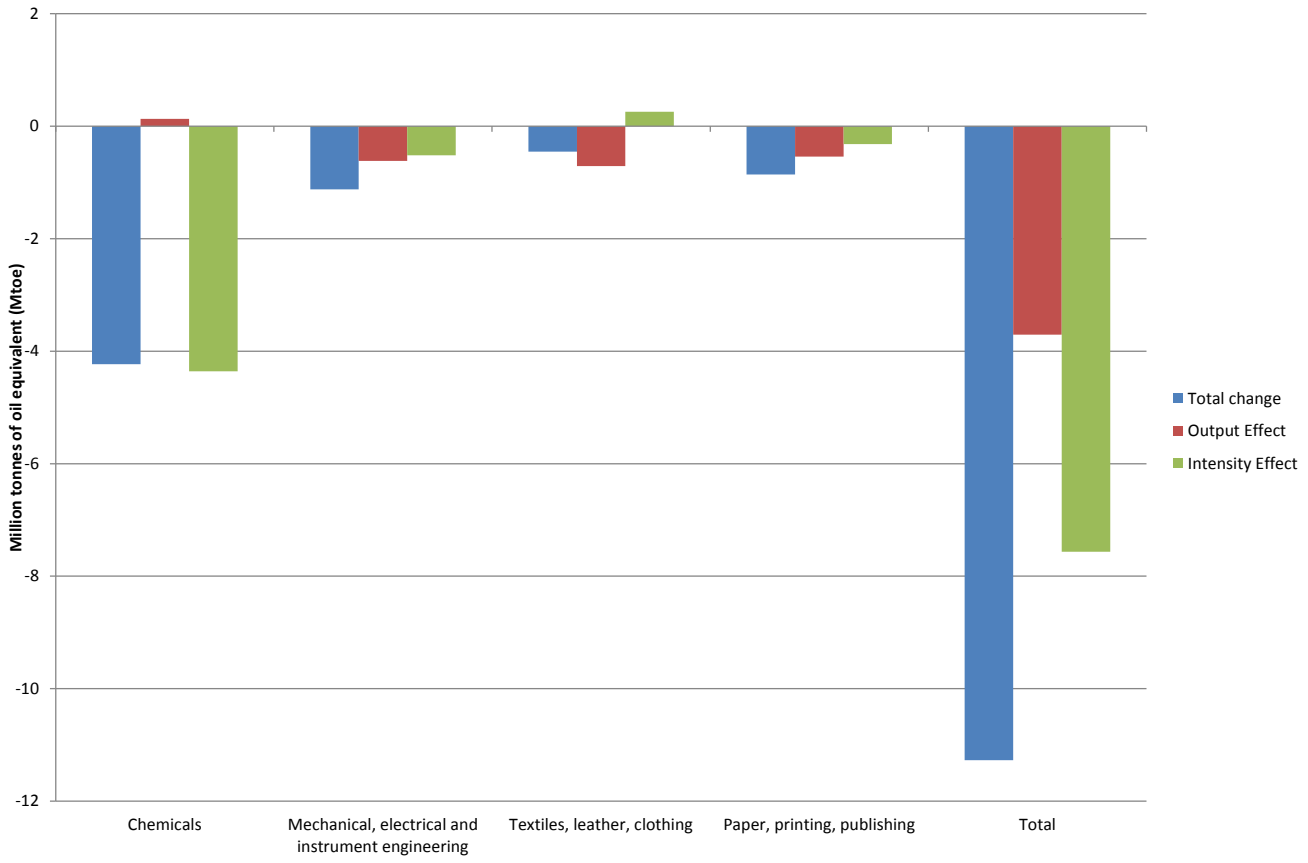


Source: DECC, ECUK Table 4.03

4. Factors affecting industrial energy consumption since 2000 and energy intensities since 1990

Chart 4 shows that between 2000 and 2013, energy consumption in the industrial sector fell by 11.3 Mtoe, a reduction of 32 per cent. It has been estimated[2] that if efficiency had remained at 2000 levels, an additional 4.7 Mtoe would have been needed to produce the same amount of output.

Chart 4 **Factors affecting change in UK industrial energy use between 2000 and 2013**



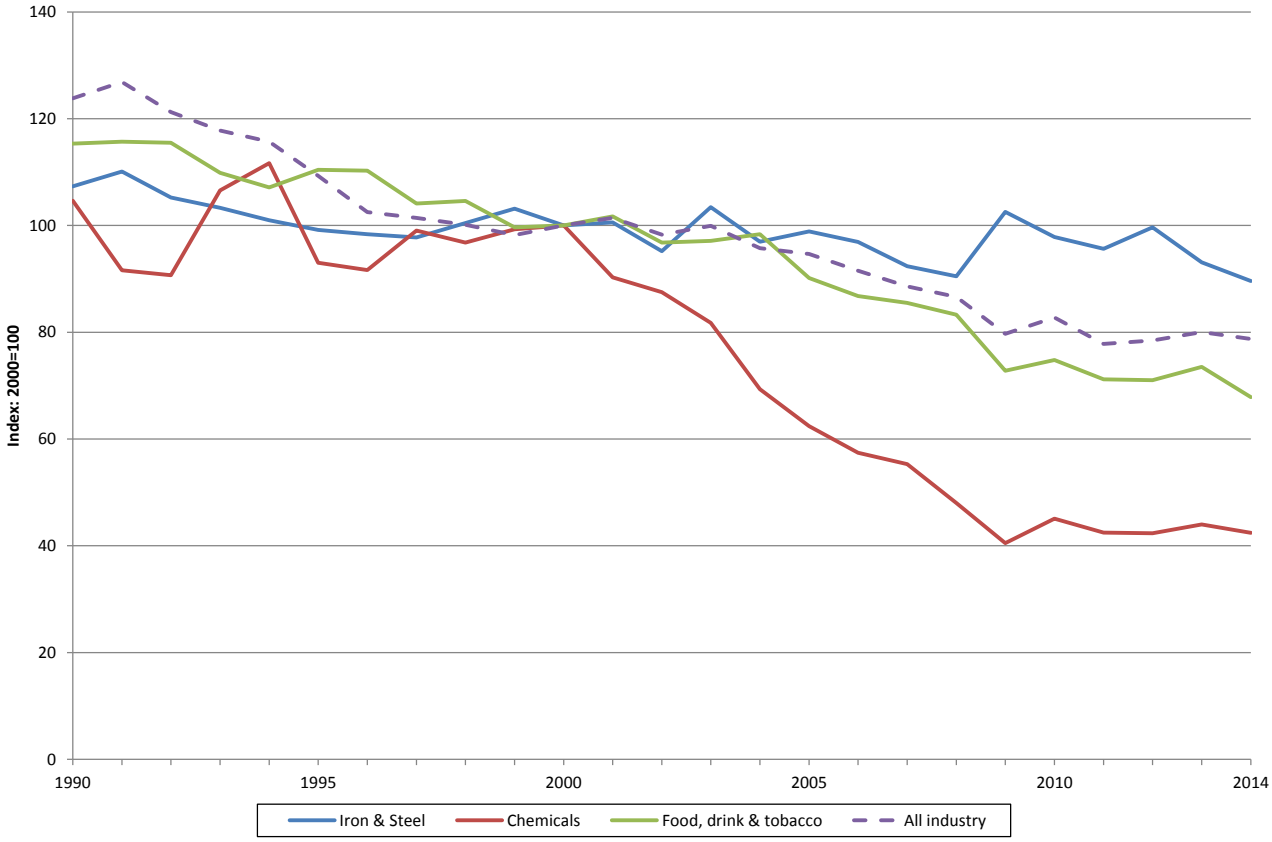
Source: DECC, ECUK Table 4.19

The main efficiency gains were in the textiles, leather, clothing sector and mechanical, electrical and instrument engineering sector where an additional 0.7 million tonnes of oil equivalent (per sector) would have been required to produce the existing output.

[2] For further details of the estimation please see Chapter 4 of the User Guide, which can be accessed here: https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/energy-consumption-in-the-uk.

Chart 5 shows energy intensities for selected industrial groups between 1990 and 2014.

Chart 5 **Industrial energy intensities for selected industrial groups, UK (1990 to 2014)**



Source: DECC, ECUK Table 4.20

The chemical sector showed the largest improvement in intensity with rates falling 58 per cent since 2000 compared to 32 per cent in the food, drink and tobacco sector and 10 per cent in the iron and steel sector. Food drink and tobacco experienced the biggest fall in intensity between 2013 and 2014, 7.7 per cent. This is roughly double the decrease in both the chemicals and iron and steel subsector, which fell at 3.6 and 3.8 respectively over the same time period.

Annex A Publication timetable for ECUK Chapter 4 tables in 2015

Users should note that in this edition of ECUK tables and analysis will be updated on a phased basis, so not all data will be available from the end of July as has been the case in previous editions. Also, where underlying information from the calculations is considered not to reflect the current situation tables will not be updated until more robust information becomes available. The table below illustrates when each table for this chapter will be published.

Publication timetable for ECUK Chapter 4 tables in 2015

Table number in publication (2015)	Table Name	Link to another publication:
4.01	Industrial energy demand by fuel, in primary energy equivalents 1970 to 2014	-
4.02	Industrial energy consumption by fuel, 1970 to 2014	-
4.03	Industrial energy consumption by main industrial consuming group, 1990 to 2014	-
4.04	Industrial energy consumption at two digit SIC2007 level by fuel type, 2014	-
4.05	Industrial energy consumption by end use (different processes), 2014	-
4.06	Industrial energy consumption at two digit SIC2007 level by fuel type, 2013	-
4.07	Industrial energy consumption by end use (different processes), 2013	-
4.08	Industrial energy consumption at two digit SIC2007 level by fuel type, 2012	-
4.09	Industrial energy consumption by end use (different processes), 2012	-
4.10	Industrial energy consumption at two digit SIC2007 level by fuel type, 2011	-
4.11	Industrial energy consumption by end use (different processes), 2011	-
4.12	Industrial energy consumption at two digit SIC2007 level by fuel type, 2010	-
4.13	Industrial energy consumption by end use (different processes), 2010	-
4.14	Industrial energy consumption at two digit SIC2007 level by fuel type, 2009	-
4.15	Industrial energy consumption by end use (different processes), 2009	-
4.16	Industrial energy consumption at two digit SIC2007 level by fuel type, 2008	-
4.17	Detailed industrial energy consumption, by fuel, 2007	-

4.18	Factors that affect industrial energy consumption, 1970 to 2014	-
4.19	Output and intensity factors affecting changes in industrial energy use, 1990 to 2013	-
4.20	Energy intensity (energy consumption per unit of production) by main industrial group, 1970 to 2014	-

Annex B Related DECC publications

Energy consumption statistics are also available in:

- **The Digest of UK Energy Statistics (DUKES).**

  Much of the data contained in ECUK are based on estimates from DUKES. DUKES is an annual publication which includes tables, charts and commentary covering all the major aspects of energy, it provides a detailed and comprehensive picture of fuel production and consumption during the last three years.

  The Digest is also available on the Internet. This includes some additional information including data (available in MS Excel format) from earlier years which are not contained in the printed copy publication. Available from The Stationery Office (0870 600 5522) or www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes

- **Energy Trends**

  A quarterly publication which includes tables, charts and commentary covering all the major aspects of energy, it provides a comprehensive picture of energy production and use. Available on subscription (together with Quarterly Energy Prices) from DECC (0300 068 5041).

  www.gov.uk/government/collections/energy-trends

- **Sub-national consumption statistics**

  The sub-national data contain estimates at regional, local authority and MSOA/LSOA (for electricity and gas consumption statistics) geographies. However, it is worth noting that the data are not comparable with DUKES and ECUK due to differing data sources.

  A full summary of the sub-national consumption datasets available, along with links to relevant datasets, is included on pages 10 and 11 of the sub-national methodology and guidance booklet, which can be accessed here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/324877/Sub-national_methodology_and_guidance_booklet.pdf.

- **National Energy Efficiency Data-framework (NEED)**

  The National Energy Efficiency Data-Framework (NEED) was set up by DECC to provide a better understanding of energy use and energy efficiency in domestic and non-domestic buildings in Great Britain. The data framework matches gas and electricity consumption data with information on energy efficiency measures installed in homes. It also includes data about property attributes and household characteristics.

  www.gov.uk/government/collections/national-energy-efficiency-data-need-framework

Comparisons between DUKES, ECUK and sub-national consumption statistics are summarised in Annex C (page 77) of the sub-national guidance and methodology booklet: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/324877/Sub-national_methodology_and_guidance_booklet.pdf.

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