
Employment based energy consumption mapping in the UK



Customer:

The Department for Environment, Food and Rural Affairs, Department for Energy and Climate Change, Welsh Assembly Government, the Scottish Executive and the Department of the Environment for Northern Ireland

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1 Introduction

Data on energy use from large industrial and commercial sites (point sources) are collected and compiled for the outputs produced for the National Atmospheric Emissions Inventory (NAEI). This includes fuel consumption from all regulated processes in the UK, all installations covered by the EU-ETS and other sites that are significant sources of pollution and for which appropriate data are available to the NAEI. The method used to compile these estimates is documented in the Local and Regional CO₂ emission estimates report (Webb, Mould, King, Walker, Tsagatakis, & Passant, 2012).

Energy use at smaller industrial and commercial sites is also significant in terms of energy consumption, representing about 70% of CO₂ emissions in 2010 of the total 'other industrial' (i.e. not including the large energy intensive industrial processes such as iron and steel, cement etc.), commercial and public sector consumption. However, data on these sites are not available in a consistent format across the UK. Therefore proxy data on employment and energy use are used to estimate energy use and emissions at these locations.

This report describes the methods used to estimate the total energy use at the UK level that is used in these smaller industrial, commercial and public sector locations and to model the distribution of this energy use across the UK at 1km² resolution. The distribution maps described in this report replace those previously used for the NAEI mapping which were produced twice in the past; for the 2006 and 2003 inventories. The method used is similar to that used previously, using a combination of employment data from the Inter-Departmental Business Register database and DECC energy statistics by industrial and commercial sector. But significant improvements have been made this time in addition to updating the input data.

The outputs of this complex spatial modelling work are used in the generation of detailed 1km² resolution NAEI emission maps for air quality and climate change gases as well as being used for spatially aggregated NAEI outputs such as the Local and Regional CO₂ emission estimates, the Devolved Administration Inventories and the DECC sub-national energy statistics for other fuels i.e. solid and liquid fuels (Tsagatakis, Passant, & Mould, 2011).

2 Data sources

This section of the report describes the data sets used as inputs to the process of modelling energy use from industrial, commercial and public sector sites that are not included in the NAEI point source database.

2.1 Employment data

The Inter-Departmental Business Register¹ (IDBR) database provides detailed data on numbers of employees at each registered UK business by site. This database, with 2.1 million businesses listed, covers about 99% of economic activity across the UK.

An extract from the IDBR was obtained from ONS, with the data fields as shown in Table 2.1. The grid reference was used to aggregate total numbers of employees for each 1km grid square in each SIC sector.

Table 2.1 – The information held on the IDBR for each business

Field	Description
Local Unit	Local Unit Reference Code
Enterprise	Enterprise Reference Code
Reporting Unit	Reporting Unit Reference Code
Name	Local Unit Name
Address	Local Unit Address
Postcode	Local Unit Postcode
Employment	Total number of employees figure plus working proprietors
Employees	Total number of people employed, excluding proprietors
SIC2003	UK Standard Industry Classification 2003
SIC2007	UK Standard Industry Classification 2007
GOR	Regions (Former Government Offices for the Regions)
Grid Reference	Locations on map using Cartesian coordinates

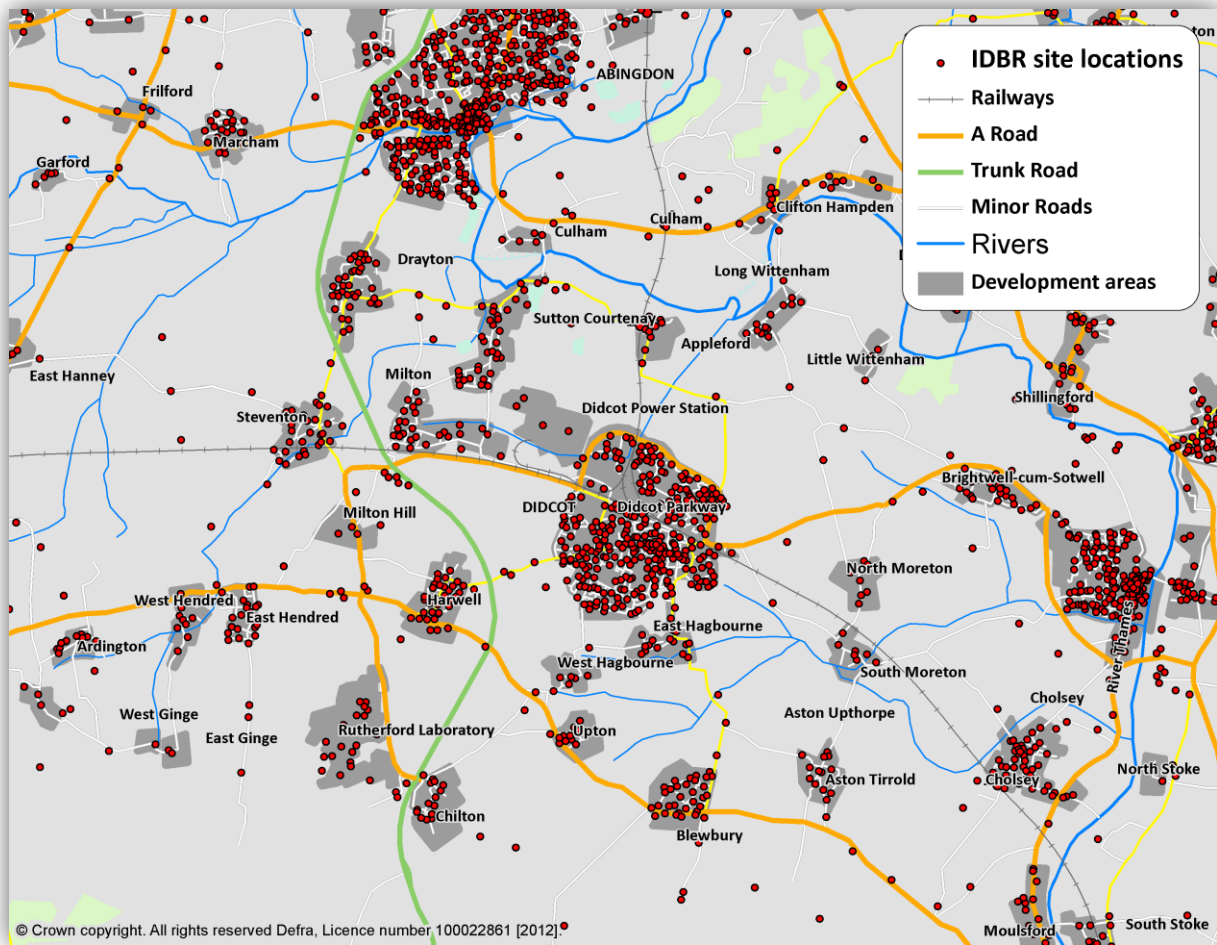
Each business has been allocated to two Standard Industry Classification (SIC) 5-digit codes; 2003 and 2007². Both of these data fields were used to match with two different datasets. Appendix 1 & Appendix 2 indicate the divisions of these codes, also noted as two digits SIC. The sites are classified into Local units and Enterprise Units – Enterprise units being head offices of businesses that have more than one site. If a business has only one site it is listed in the Enterprise dataset.

The map on Figure 2.1 below shows a small sample of the sites of all types of employment in the IDBR, showing the density of this dataset within a mixed rural and urban area of South Oxfordshire.

¹ <http://www.ons.gov.uk/ons/about-ons/who-we-are/services/unpublished-data/business-data/idbr/index.html>

² <http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html>

Figure 2.1 – Illustration of a sample of the IDBR site locations



2.2 Energy Statistics

Sector specific fuel use statistics are available in an annual basis from DECC through the Energy Consumption in the UK (ECUK) publication (DECC, 2012). In particular the data used in this study are in Industrial data tables 4.6a, 4.6b & 4.6c, and Service sector data tables 5.1c & 5.6³.

The data for these tables are compiled from the Purchases Inquiry (PI), a sub-survey of the ONS's Annual Business Inquiry. A sample of 6,000 businesses was asked about the monetary value of purchases of fuel and electricity. The User Guide (DECC, 2011) explains how the survey data were aggregated up to cover all businesses in each sector. In the latest edition of ECUK, two new Tables 4.6a & 4.6b were introduced which are the equivalent of the previously published Table 4.6 but aggregated at a two digit SIC level instead of 4 digit SIC level.

Table 2.2 & Table 2.3 below indicate a breakdown of the fuel consumption in industrial, commercial and services sectors in 2009 as provided from the ECUK tables described above.

³ <http://www.decc.gov.uk/en/content/cms/statistics/publications/ecuk/ecuk.aspx#>

Table 2.2 – Industrial energy consumption by fuel type in 2009 (Thousand tonnes of oil equivalent) based on DECC Table 4.6a

SIC(2003) codes	Description	Coal	Manufactured fuel	LPG	Gas oil	Fuel oil	Burning oil	Renewables	Natural gas	Electricity	Total
14	Other mining and quarrying	-	-	-	111	24	-	-	95	133	363
15	Manufacture of food products and beverages	33	-	-	203	39	-	-	1,797	913	2,985
16	Manufacture of tobacco products	-	-	-	-	-	-	-	7	11	18
17	Manufacture of textiles	49	-	-	59	11	-	-	375	215	708
18	Manufacture of wearing apparel; Dressing and dyeing of fur	-	-	-	22	-	-	-	55	25	101
19	Manufacture of leather and leather products	-	-	-	-	-	-	-	17	18	35
20	Manufacture of wood and wood products	-	-	-	331	3	-	-	163	214	712
21	Manufacture of pulp, paper and paper products	71	-	-	24	25	-	-	1,050	612	1,783
22	Publishing, printing and reproduction of recorded media	-	-	-	3	6	-	-	188	339	536
23	Manufacture of coke, refined petroleum products and nuclear fuel	1,081	1,949	-	-	870	-	-	375	436	4,712
24	Manufacture of chemicals, chemical products and man-made fibres	49	-	-	90	50	-	-	2,205	1,523	3,916
25	Manufacture of rubber and plastic products	130	-	-	282	4	-	-	373	875	1,664
26	Manufacture of other non-metallic mineral products	711	-	-	36	-	-	-	1,207	470	2,425
27	Manufacture of basic metals	60	354	-	18	80	-	-	647	859	2,019
28	Manufacture of fabricated metal products (except machinery and equipment)	10	-	-	32	5	-	-	345	395	787
29	Manufacture of machinery and equipment	-	-	-	35	15	-	-	207	266	523
30	Manufacture of office machinery and computers	-	-	-	4	2	-	-	8	28	41
31	Manufacture of electrical machinery and apparatus	-	-	-	13	5	-	-	156	215	388
32	Manufacture of radio, television and communication equipment and apparatus	3	-	-	9	-	-	-	47	177	236
33	Manufacture of medical, precision and optical instruments, watches and clocks	-	-	-	7	2	-	-	71	134	214
34	Manufacture of motor vehicles, trailers and semi-trailers	32	-	-	50	8	-	-	441	273	804

SIC(2003) codes	Description	Coal	Manufactured fuel	LPG	Gas oil	Fuel oil	Burning oil	Renewables	Natural gas	Electricity	Total
35	Manufacture of other transport equipment	-	-	-	30	14	-	-	183	158	385
36	Manufacture of furniture	-	-	-	119	2	-	-	147	192	460
37	Recycling	-	-	-	591	1	-	-	17	50	659
41	Collection, purification and distribution of water	-	-	-	77	1	-	-	24	439	541
45	Construction	3	-	-	119	19	-	-	183	136	461
Un	Unclassified	-	206	757	-	-	1,612	447	2	-	3,024
Total	Industrial consumption excluding SIC 23	1,152	561	757	2,265	315	1,612	447	10,009	8,671	25,788
Total	Industrial consumption including SIC 23	2,233	2,510	757	2,265	1,185	1,612	447	10,385	9,107	30,499

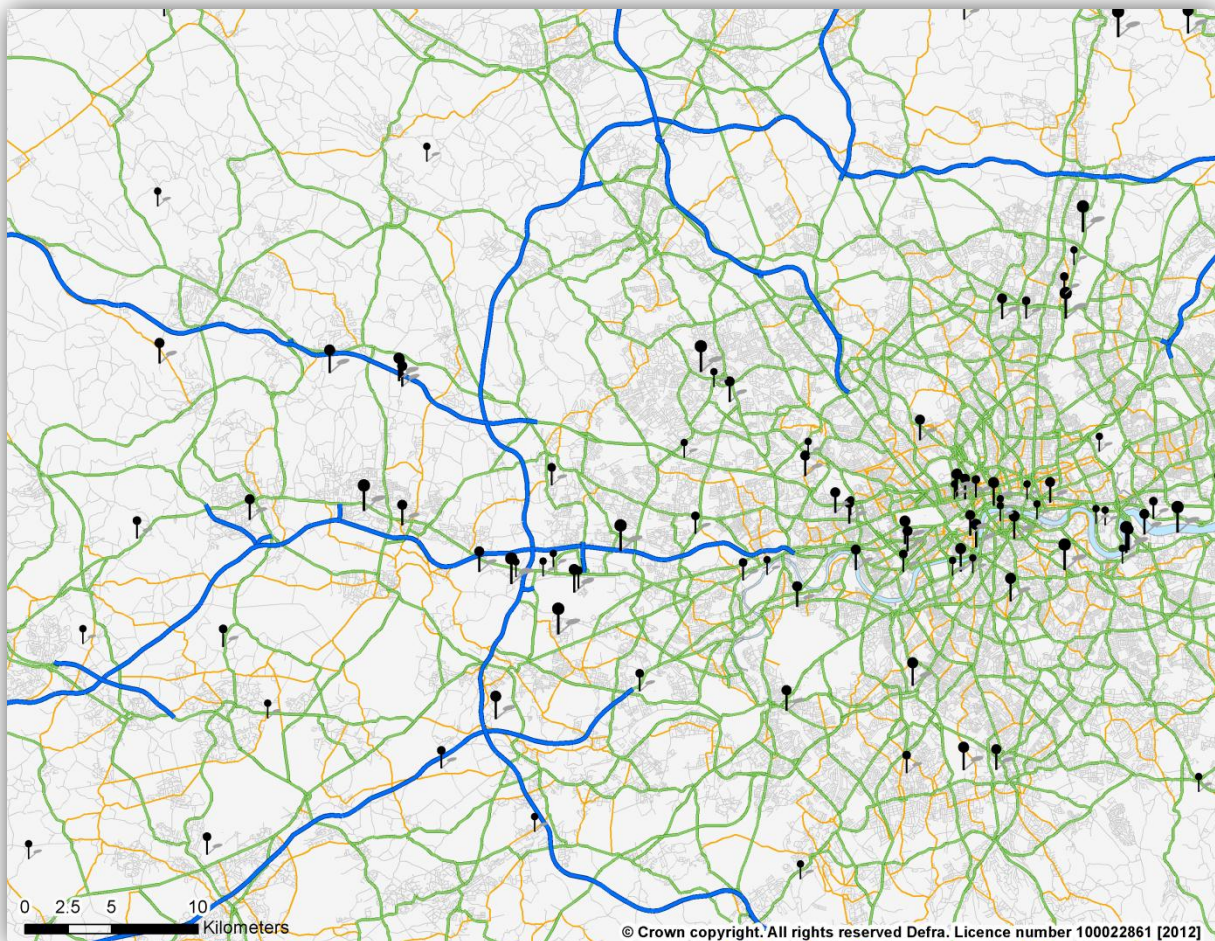
Table 2.3 – Service sector final energy consumption by sub-sector and end use by fuel in 2009 (Thousand tonnes of oil equivalent)

SIC(2003) codes	Subsector	Electricity	Natural Gas	Oil	Solid fuel	All
63.3, 63.4, 65, 66, 67, 70, 72, 73,74	Commercial Offices	759	564	98	-	1,421
60, 61, 62, 63.2, 64	Communication and Transport	417	53	4	8	482
80	Education	764	1,406	211	7	2,389
75	Government	543	888	114	3	1,548
85	Health	364	895	46	7	1,311
55	Hotel and Catering	938	1,057	57	26	2,077
91, 93, 96, 99	Other	377	357	53	3	790
50.1, 50.3, 50.4, 50.5, 52, 71	Retail	2,673	719	55	-	3,447
92	Sport and Leisure	430	364	5	-	799
50.2, 51, 63.1	Warehouses	957	738	314	-	2,009
	Total	8,223	7,040	957	53	16,273

2.3 Point sources

Data on Site-specific (point source) fuel consumption are collated in the NAEI point source database. They are compiled from data for regulated processes reported in the EA Pollution Inventory, Scottish SPRI, DoE NI Inventory of Statutory Releases, by the EU-ETS and from other data obtained by the inventory. The UK Emission Methodology 2009 (Tsigatakis, Bush, Walker, Passant, Webb, & Brookes, 2011) and the Local and Regional CO₂ technical report (Webb, Mould, King, Walker, Tsigatakis, & Passant, 2012) describe in more detail the methodology used to calculate the fuel use at point sources. Figure 2.2 shows the locations of industrial and commercial point sources around the Greater London Area to illustrate the amount of detail within this dataset.

Figure 2.2 – Illustration of a sample of Industrial and commercial point sources in the London area



2.4 Display Energy Certificate data

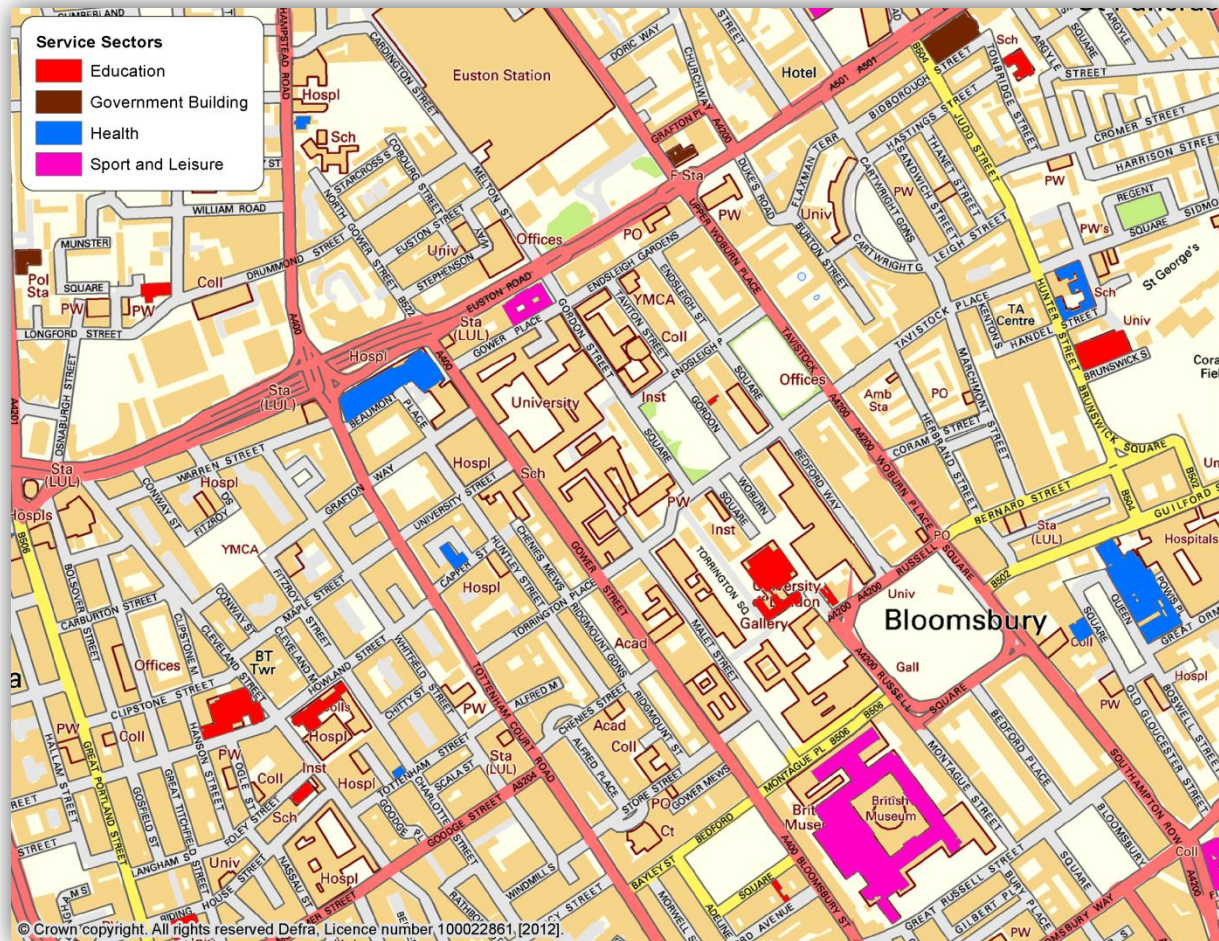
The Display Energy Certificates (DECs) dataset has been provided by the Department for Communities and Local Government (CLG)⁴. DECs were introduced in 2008 and are required in all public sector buildings/offices larger than 1000 m², frequently visited by the public. DECs rate the operational energy efficiency and performance of a building with a

⁴ <http://www.communities.gov.uk/planningandbuilding/sustainability/energyperformance/displayenergycertificates/>

rating from A to G - much like energy ratings for domestic appliances. The DEC also states the building's energy use in kWh by fuel type and the CO₂ emissions tonnes per year. This is very useful data for this current modelling exercise.

The qualified engineer issuing the certificate will also have provided a report, including suggestions for improving energy efficiency. Figure 2.3 indicates buildings in central London highlighting buildings issued with a DEC.

Figure 2.3 – Buildings issued with Display Energy Certificate



2.5 Gas consumption data for England, Wales, Scotland and Northern Ireland

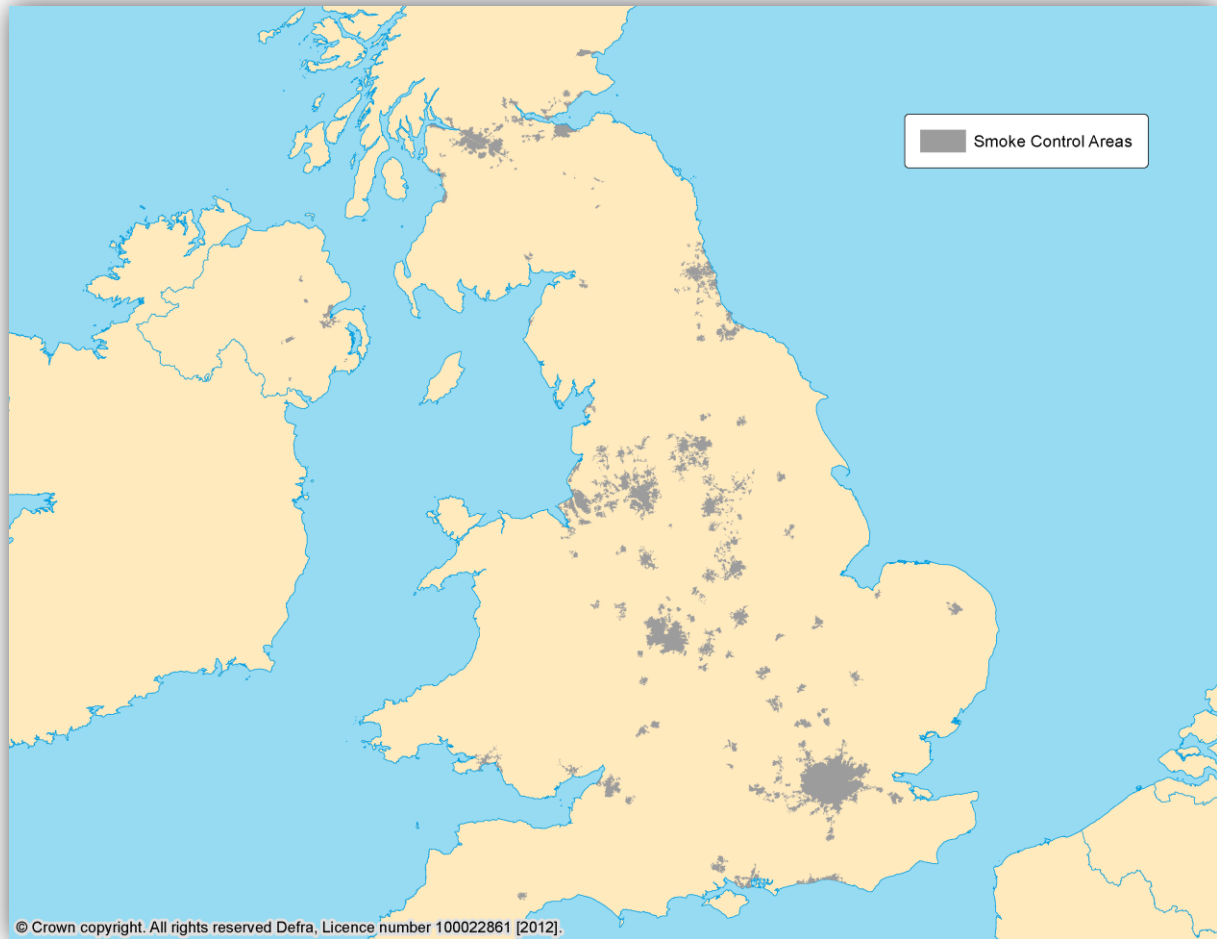
Data on the distribution of gas consumption for industry and commerce is available from DECC across Great Britain (MLSOA for England and Wales, Intermediate Geography for Scotland; hereafter referred to as the MLSOA gas data).

Furthermore, a dataset of 1 km² resolution gas consumption by non-domestic users was obtained from DECC for the purpose of this modelling. This enabled the production of a map of the extent of the gas network (presence or absence of gas supply) and was used as an indicator for gas availability to industry and commercial sites. For the squares, where the gas consumption was available, an adjusted factor was applied to reflect the measured gas use.

2.6 Smoke control area boundaries

A map of Smoke Control Areas was created by combination of a digital picture of Smoke Control Area available from Defra and urban area boundaries. This map was used to assign the locations of coal consumption in some sectors outside these boundaries.

Figure 2.4 – Smoke control areas in the UK



3 Analysis

This section describes the methods used to analyse and combine the datasets to model the distribution of energy consumption across the UK by fuel type. Estimates of gas consumption could be compared with and corrected to detailed metered data at Local Authority and Middle Layer Super Output area level whereas estimates of other fuels (oils and coal) are more uncertain because there are no consistent data on actual consumption of these fuels.

3.1 Process flow diagrams

The following pages summarise graphically the data flows and processes for the modelling undertaken for each of the fuel types considered here.

Figure 3.1 – Legend for the process flow diagrams below

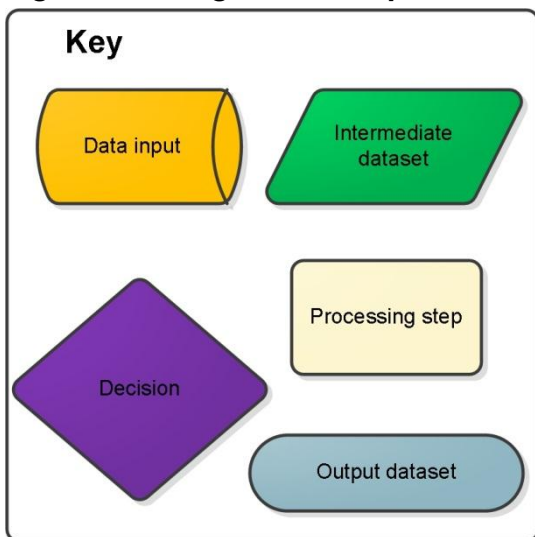


Figure 3.2 – Gas use modelling process

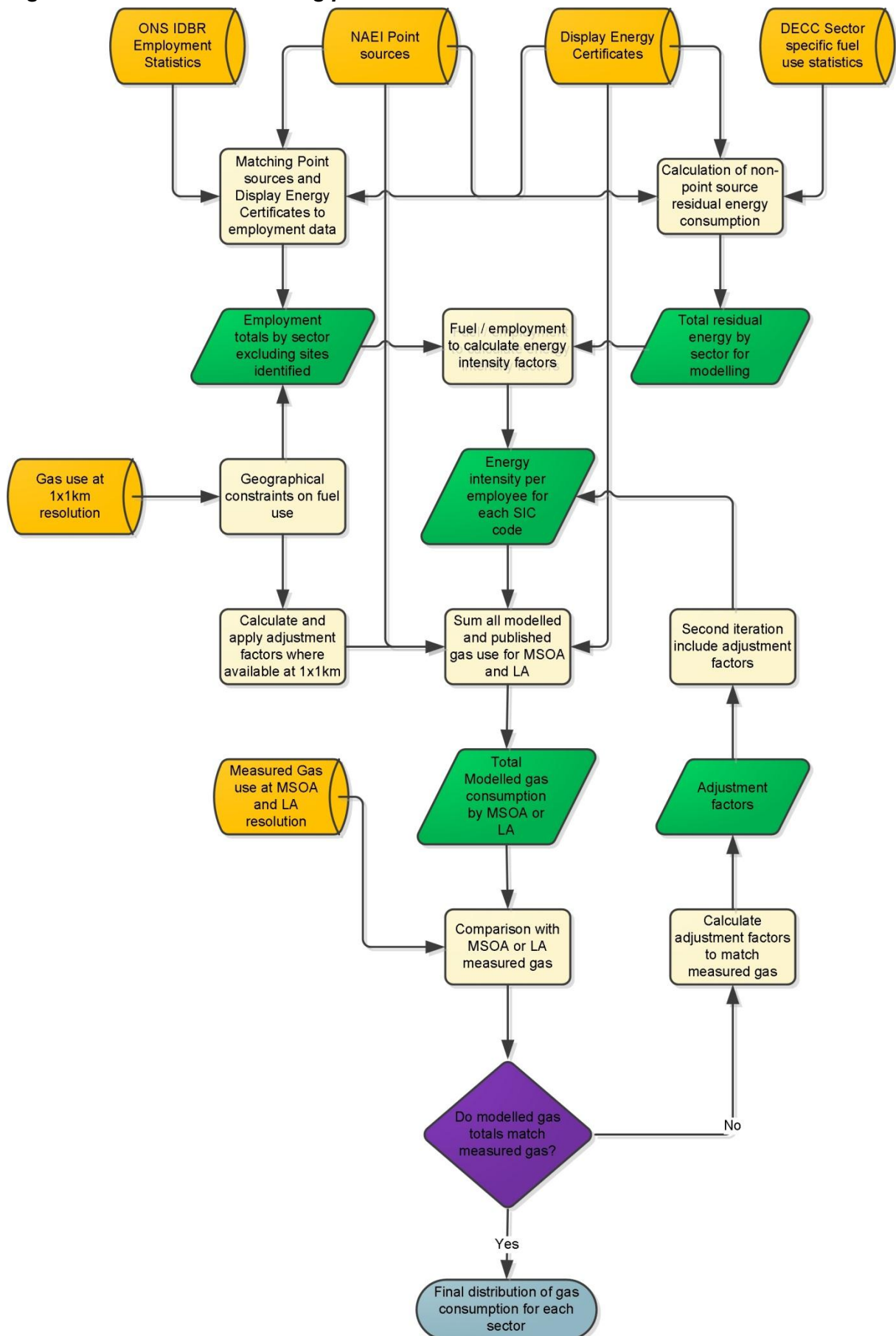


Figure 3.3 – Oil use modelling process

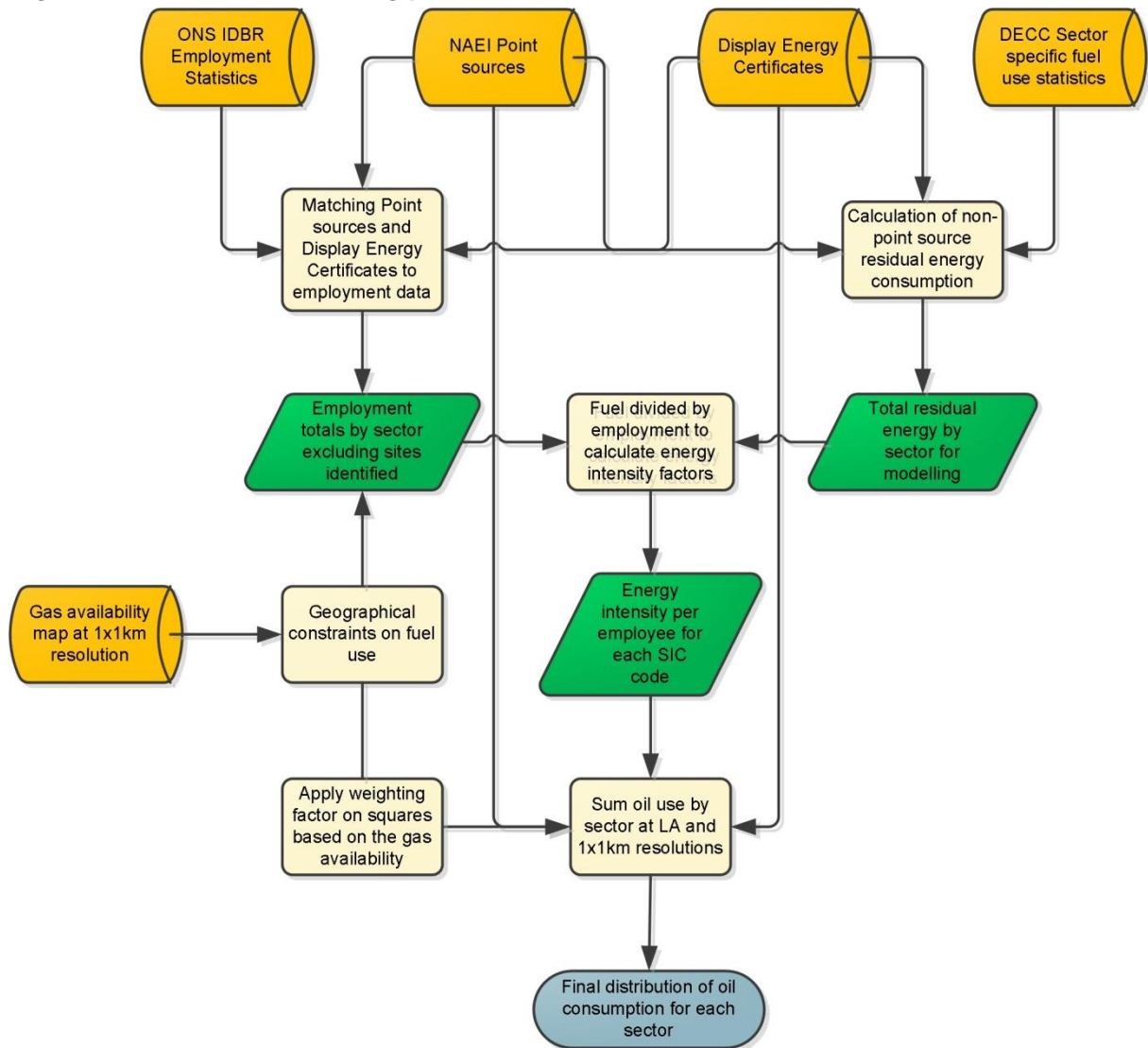
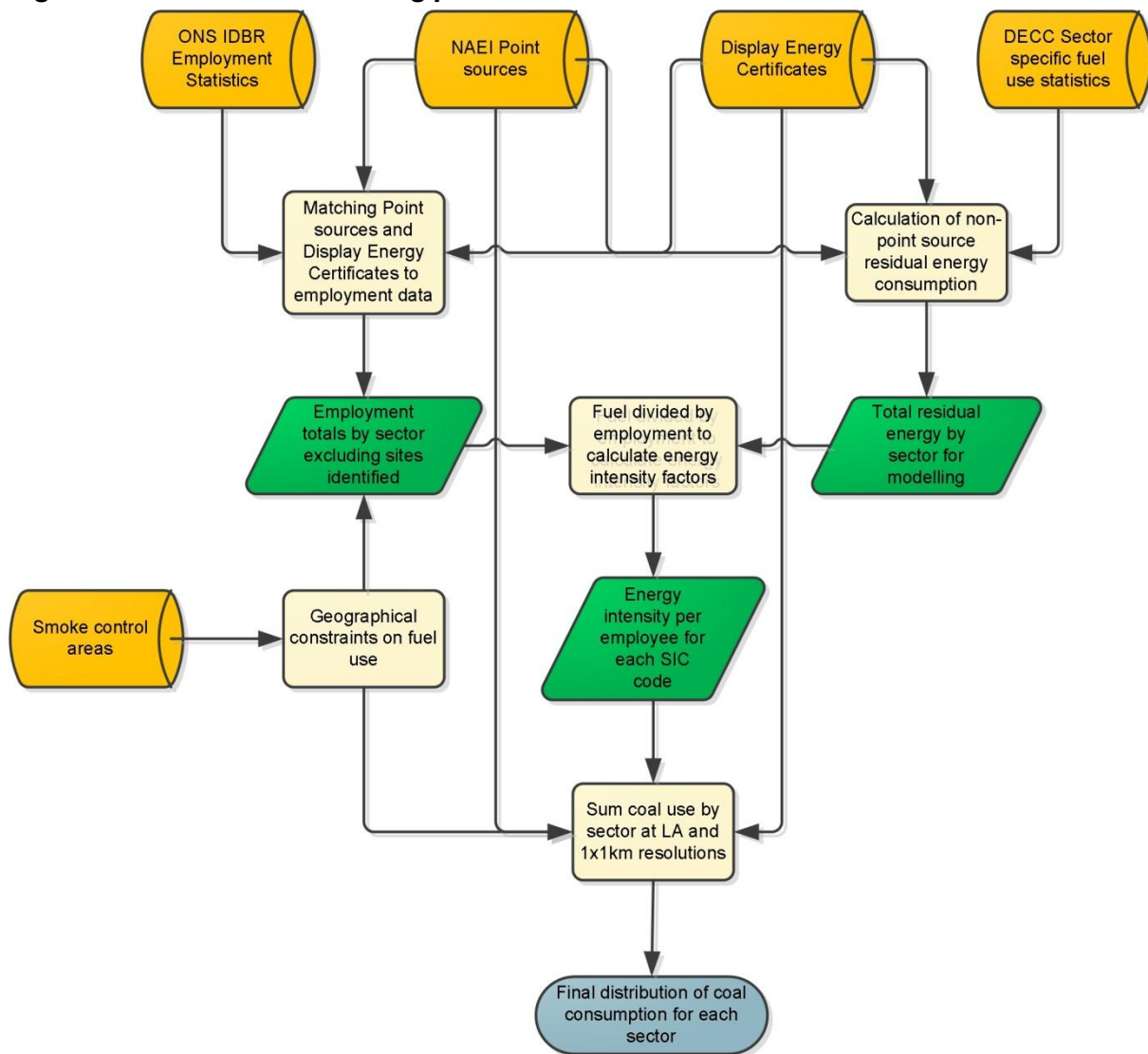


Figure 3.4 – Coal use modelling process



3.2 Matching Point sources and Display Energy Certificates to employment data

Firstly it was important to identify overlaps between the NAEI point source database, and Display Energy Certificates and the IDBR database. This was necessary to prevent double counting of energy consumption both at the national level but also at the detailed spatial level.

To enable the data matching first the NAEI point sources and DECs were allocated to SIC codes. DECs were also allocated to NAEI emissions sectors. The total energy consumption associated with these identified points was then calculated at 2 digit SIC code using the bottom-up fuel use data in the NAEI points database and the DECs.

Then the locations of each of the NAEI points and DEC buildings were matched to records in the IDBR employment dataset. This matching was based on information on the location organisation name, SIC code and postcode. This matching allowed these employment records to be removed from the modelling to prevent double counting. Significant emphasis was given to this task in order to improve the final energy maps compared with those previously produced.

3.3 Matching NAEI sectors to SIC codes

The next step in the analysis was to allocate SIC codes in the energy and employment datasets to NAEI sectors. This enabled the aggregation of fuel use estimates to NAEI sectors to compare energy consumption totals and also eventually to generate maps consistent with NAEI sector boundaries for distributing emissions data. The two main NAEI sectors relevant to the fuel use mapping are 'Other industry' (i.e. not the largest industrial emitters such as iron and steel or the cement industry) and commercial and public sector.

3.4 Calculation of non-point source residual energy consumption

Once all of the energy data at national level and at identified sites (both NAEI points and DECs, see **Section 2.3 & 2.4**) had been allocated to SIC codes and NAEI sectors the total energy consumption in each dataset could be compared. This provided an estimate of the total residual energy consumption, i.e. the energy not used at those identified sites. This residual energy then should be distributed using the employment data. Table 3.1 shows examples of these calculations for the services sectors just for oil use.

Table 3.1 - Calculation of service sector oil consumption in 2009 (thousand tonnes of oil equivalent)

Sectors	Sub-sectors	Final UK energy consumption (ECUK Tables)	Total fuel from site-specific datasets (e.g. Points sources)	Total residual energy for modelling
Agriculture - stationary combustion	Agriculture	284.75	0.26	284.49
Miscellaneous industrial / commercial combustion	Communication and Transport	4.11	2.64	1.46
Miscellaneous industrial / commercial combustion	Commercial Offices	98.41	4.81	93.60
Miscellaneous industrial / commercial combustion	Hotel and Catering	56.97	0.01	56.96
Miscellaneous industrial / commercial combustion	Other	53.02	0.04	52.99
Miscellaneous industrial / commercial combustion	Retail	54.86	0.00	54.86
Miscellaneous industrial / commercial combustion	Sport and Leisure	5.30	0.22	5.09
Miscellaneous industrial / commercial combustion	Warehouses	314.25	0.01	314.24
Public sector combustion	Education	210.95	2.22	208.73
Public sector combustion	Government	113.66	15.59	98.08
Public sector combustion	Health	45.70	16.77	28.92

Making the comparison and calculation of residual energy at this level allowed the highest level of detail across emissions subsectors to be retained for energy consumption mapping. This is considered to be a major improvement for the new version set of maps compared to previous similar modelling.

In addition, more detailed allocations of specific industry SIC codes to NAEI sectors were also used for the non-fuel emission modelling. Examples of these sectors are Brick manufacture, Marine industrial coatings, Ammonia production and many more.

3.5 Energy intensity factors

Estimates of fuel intensity per employee were needed in order to be able to distribute the residual energy by sector across the IDBR employment sites and hence create maps of fuel use. Total UK employee numbers in the IDBR were aggregated to the same level of sector detail at which DECC energy data are available. This is at SIC 2003 2-digit code level for industrial sectors (see Table 2.2 above) but at a higher level for commercial and service sectors. These total numbers of employees by SIC code (4,3, or 2 digit codes as appropriate) were calculated from the IDBR database, but excluding the allocated sites identified in **section 3.2**. This calculation of total employees also took account of the geographical areas appropriate to the relevant fuels; i.e. for each sector all employees within the gas availability map have been counted.

The total residual energy by SIC code (as described in **section 3.4**) and total number of employees for the same codes were then used to derive to a national average energy intensity factor per employee for each fuel type for each sector for these residual energy locations.

The fuel intensity factors were then applied across the employment distribution from the IDBR to create maps of fuel use by industry sector.

3.6 Gas consumption to adjust the distribution of gas predicted by the employment and energy intensity data

An underlying assumption in this analysis is that energy intensity is consistent within industrial sectors for large and small sites within each sector. This is obviously a simplification and in the case of gas the adjustment of the modelling results using real gas consumption data has helped to improve this using an iterative approach of comparison and adjustment.

The DECC and 1 km² gas datasets were compared with initial modelled estimates of gas and adjustment factors were calculated to apply to improve the initial estimates to ensure modelled and measured estimates were consistent as far as possible for gas. This correction was possible at the MLSOA level in some locations but at LA level in other locations owing to the levels of reporting of gas data in the DECC dataset.

The adjustment factors could not be calculated at MSOA level in many cases because measured gas data were not available for all MSOAs. The reason for this is the aggregation of MSOA gas consumption across multiple MSOAs to prevent disclosure. There is also some gas that is unallocated to MSOAs in many LAs because of insufficient geographic information for the allocation. In the cases where more than 5% of an LA's gas consumption was aggregated or unallocated we took the decision to adjust the modelled gas estimates at the LA level; i.e. apply the same adjustment factor to all MSOAs in the LA. In cases where less than 5% of gas was aggregated or unallocated we have not adjusted the modelled estimates in the relevant MSOAs but we have checked the overall amount of gas estimated in the LA to ensure that overall gas consumption in the LA matches well with the measured gas.

The DECC dataset does not provide a distribution of gas consumption in Northern Ireland. Data were added using information on gas consumption by industry and commerce at district level from Energy providers (i.e. Phoenix Gas, Firmus, Vayu) to adjust the modelled estimates in each Northern Ireland Local Authority.

3.7 Other Fuels

The other fuels modelled using this method are coal and oil (with fuel oil and gas oil modelled separately for industrial sectors). The calculations for the distribution of other fuels are simpler than those for gas (but more uncertain) because no measured data exists for these fuels.

Based on expert knowledge of fuel used by industry and businesses the distributions of Fuel Oil and Gas Oil have been modified so that consumption is lower per employee in grid squares covered by Gas supply through the use of a weighting factor.

The distribution of coal has been limited to only outside the locations of Smoke control areas.

4 Changes in methodology

This section documents the updates and improvements that have been adopted in this mapping study in order to estimate regional fuel consumption. The main improvements and changes are described below and quantified in Table 4.1:

- Increased use of datasets with reported site-specific fuel consumption
- Advanced matching of Point sources and Display Energy Certificates to employment data
- Use of data of different years statistics to improve the energy trend:
 - Regional level employment by 2-digit SIC2007 (ONS, 2012)
 - ECUK sector specific fuel use statistics
- Minimum alteration on matching NAEI sectors to SIC codes (e.g. Energy use from construction professions like plumbers and electricians, are now included in the industrial energy distribution)
- Gas adjustment was done at 1km², where such information was disclosed in the DECC dataset
- Modification of Oil consumption on grid squares covered by Gas supply through the use of a weighting factor

Table 4.1- Improvements since last study

	2010 Inventory Method	2006 Inventory Method
No of sites	Point sources: 2,244 DECs: 40,325	Point sources: 744
No of sites matched with employment data	33,851	149
Time series	Employment: 2010 ⁵ , 2009 ⁶ , 2008 ⁷ Energy: 2010, 2009, 2008	Employment: 2007 Energy: 2005
No of 5-digit SIC2003 allocated to the NAEI sectors	690	370
Gas adjustment resolution	1km ² , Middle Level Super Output Area & Local Authority	Middle Level Super Output Area & Local Authority
Geographical constrain of oil consumption	Gas supply areas	Urban areas

⁵ <http://www.ons.gov.uk/ons/rel/bus-register/business-register-employment-survey/2010/rft-bres-2010-table-5--region-by-industry--3-digit-.xls>

⁶ <http://www.ons.gov.uk/ons/rel/bus-register/business-register-employment-survey/2009-revised/rft-bres-2009-table-5--region-by-industry--3-digit-.xls>

⁷ <http://www.ons.gov.uk/ons/rel/bus-register/business-register-employment-survey/2008/bres-table-5.xls>

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6 Appendices

Appendix 1 – 2-digit Standard Industrial Classification 2003 (UK SIC 2003)

SIC(2003) codes	Description
01	Agriculture, Hunting and Related Service Activities
02	Forestry, Logging and Related Service Activities
05	Fishing, Fish Farming and Related Service Activities
10	Mining of Coal and Lignite; Extraction of Peat
11	Extraction of Crude Petroleum and Natural Gas; Service Activities Incidental to Oil and Gas Extraction Excluding Surveying
12	Mining of Uranium and Thorium Ores
13	Mining of Metal Ores
14	Other Mining and Quarrying
15	Manufacture of Food Products and Beverages
16	Manufacture of Tobacco Products
17	Manufacture of Textiles
18	Manufacture of Wearing Apparel; Dressing and Dyeing of Fur
19	Tanning and Dressing of Leather; Manufacture of Handbags, Saddlery, Harness And Footwear
20	Manufacture of Wood And Products of Wood And Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials
21	Manufacture of Pulp, Paper and Paper Products
22	Publishing, Printing and Reproduction of Recorded Media
23	Manufacture of Coke, Refined Petroleum Products and Nuclear Fuel
24	Manufacture of Chemicals and Chemical Produ
25	Manufacture of Rubber and Plastic Products
26	Manufacture of Other Non-metallic Mineral Products
27	Manufacture of Basic Metals
28	Manufacture of Fabricated Metal Products, Except Machinery and Equipment
29	Manufacture of Machinery and Equipment Not Elsewhere Classified
30	Manufacture of Office Machinery and Computers
31	Manufacture of Electrical Machinery and Apparatus Not Elsewhere Classified
32	Manufacture of Radio, Television and Communication Equipment and Apparatus
33	Manufacture of Medical, Precision and Optical Instruments, Watches and Clocks
34	Manufacture of Motor Vehicles, Trailers and Semi-trailers
35	Manufacture of Other Transport Equipment
36	Manufacture of Furniture; Manufacturing Not Elsewhere Classified
37	Recycling
40	Electricity, Gas, Steam and Hot Water Supply
41	Collection, Purification and Distribution of Water
45	Construction

SIC(2003) codes	Description
50	Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Automotive Fuel
51	Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles
52	Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Personal and Household Goods
55	Hotels and Restaurants
60	Land Transport; Transport Via Pipelines
61	Water Transport
62	Air Transport
63	Supporting And Auxiliary Transport Activities; Activities Of Travel Agencies
64	Post and Telecommunications
65	Financial Intermediation, Except Insurance and Pension Funding
66	Insurance and Pension Funding, Except Compulsory Social Security
67	Activities Auxiliary to Financial Intermediation
70	Real Estate Activities
71	Renting of Machinery and Equipment Without Operator and of Personal and Household Goods
72	Computer and Related Activities
73	Research and Development
74	Other Business Activities
75	Public Administration and Defence; Compulsory Social Security
80	Education
85	Health and Social Work
90	Sewage and Refuse Disposal, Sanitation and Similar Activities
91	Activities of Membership Organisations Not Elsewhere Classified
92	Recreational, Cultural and Sporting Activities
93	Other Service Activities
95	Activities of Households as Employers of Domestic Staff
96	Undifferentiated Goods Producing Activities of Private Households for Own Use
97	Undifferentiated Services Producing Activities of Private Households for Own Use
99	Extra-territorial Organisations and Bodies

Appendix 2 - 2-digit Standard Industrial Classification 2007 (UK SIC 2007)

SIC(2007) codes	Description
01	Crop and animal production, hunting and related service activities
02	Forestry and logging
03	Fishing and aquaculture
05	Mining of coal and lignite
06	Extraction of crude petroleum and natural gas
07	Mining of metal ores
08	Other mining and quarrying
09	Mining support service activities
10	Manufacture of food products
11	Manufacture of beverages
12	Manufacture of tobacco products
13	Manufacture of textiles
14	Manufacture of wearing apparel
15	Manufacture of leather and related products
16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
17	Manufacture of paper and paper products
18	Printing and reproduction of recorded media
19	Manufacture of coke and refined petroleum products
20	Manufacture of chemicals and chemical products
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
22	Manufacture of rubber and plastic products
23	Manufacture of other non-metallic mineral products
24	Manufacture of basic metals
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment n.e.c.
29	Manufacture of motor vehicles, trailers and semi-trailers
30	Manufacture of other transport equipment
31	Manufacture of furniture
32	Other manufacturing
33	Repair and installation of machinery and equipment
35	Electricity, gas, steam and air conditioning supply
36	Water collection, treatment and supply
37	Sewerage
38	Waste collection, treatment and disposal activities; materials recovery
39	Remediation activities and other waste management services.
41	Construction of buildings
42	Civil engineering
43	Specialised construction activities

SIC(2007) codes	Description
45	Wholesale and retail trade and repair of motor vehicles and motorcycles
46	Wholesale trade, except of motor vehicles and motorcycles
47	Retail trade, except of motor vehicles and motorcycles
49	Land transport and transport via pipelines
50	Water transport
51	Air transport
52	Warehousing and support activities for transportation
53	Postal and courier activities
55	Accommodation
56	Food and beverage service activities
58	Publishing activities
59	Motion picture, video and television programme production, sound recording and music publishing activities
60	Programming and broadcasting activities
61	Telecommunications
62	Computer programming, consultancy and related activities
63	Information service activities
64	Financial service activities, except insurance and pension funding
65	Insurance, reinsurance and pension funding, except compulsory social security
66	Activities auxiliary to financial services and insurance activities
68	Real estate activities
69	Legal and accounting activities
70	Activities of head offices; management consultancy activities
71	Architectural and engineering activities; technical testing and analysis
72	Scientific research and development
73	Advertising and market research
74	Other professional, scientific and technical activities
75	Veterinary activities
77	Rental and leasing activities
78	Employment activities
79	Travel agency, tour operator and other reservation service and related activities
80	Security and investigation activities
81	Services to buildings and landscape activities
82	Office administrative, office support and other business support activities
84	Public administration and defence; compulsory social security
85	Education
86	Human health activities
87	Residential care activities
88	Social work activities without accommodation
90	Creative, arts and entertainment activities
91	Libraries, archives, museums and other cultural activities
92	Gambling and betting activities
93	Sports activities and amusement and recreation activities
94	Activities of membership organisations

SIC(2007) codes	Description
95	Repair of computers and personal and household goods
96	Other personal service activities
97	Activities of households as employers of domestic personnel
98	Undifferentiated goods- and services-producing activities of private households for own use
99	Activities of extraterritorial organisations and bodies



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