



GREATER LINCOLNSHIRE ENERGY SECTOR CLUSTER PLAN SUPPORT

OCTOBER 2024

INTRODUCTION & DISCLAIMER

This report has been put together with the aim of supporting the production of a cluster plan for Greater Lincolnshire’s energy sector, primarily through the delivery of evidence requested as part of the Energy Council’s ‘work programme one’ focused on the size of the sector in Greater Lincolnshire, and its role in supporting other “game-changing” sectors.

The report contains data made available under an Open License and accessed via the Department for Energy Security and Net Zero, the Office for National Statistics, the National Grid and Northern Power Grid, alongside data from Cambridge Econometrics Local Economy Forecasting Model (LEFM) under licence from Lincolnshire County Council.

Codename:Consulting is not responsible for data verification nor data-cleaning, and data has been analysed as is, with any faults. As such, all data-driven conclusions in this report are based purely on the data available for public access at the time of writing. All data used in this document is either the most up-to-date available at the time of the data review, or the most relevant.

All maps have been produced using the open-source Geographic Information Systems software ‘QGIS,’ produced by the QGIS Development Team (2024) and made possible by the Geospatial Foundation Project.

Codename:Consulting - October 2024



Adam Peacock

Director



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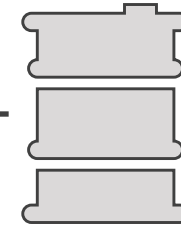


DEFINING THE GREATER LINCOLNSHIRE ENERGY SECTOR



'Traditional' Energy sector:

- Production, transmission, and distribution of, and trade in, electricity
- Extraction, manufacture and distribution of, and trade in, gas / gaseous fuels

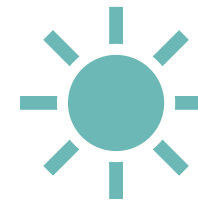


Extraction and manufacture of refined oil and petroleum products



Green Energy sectors:

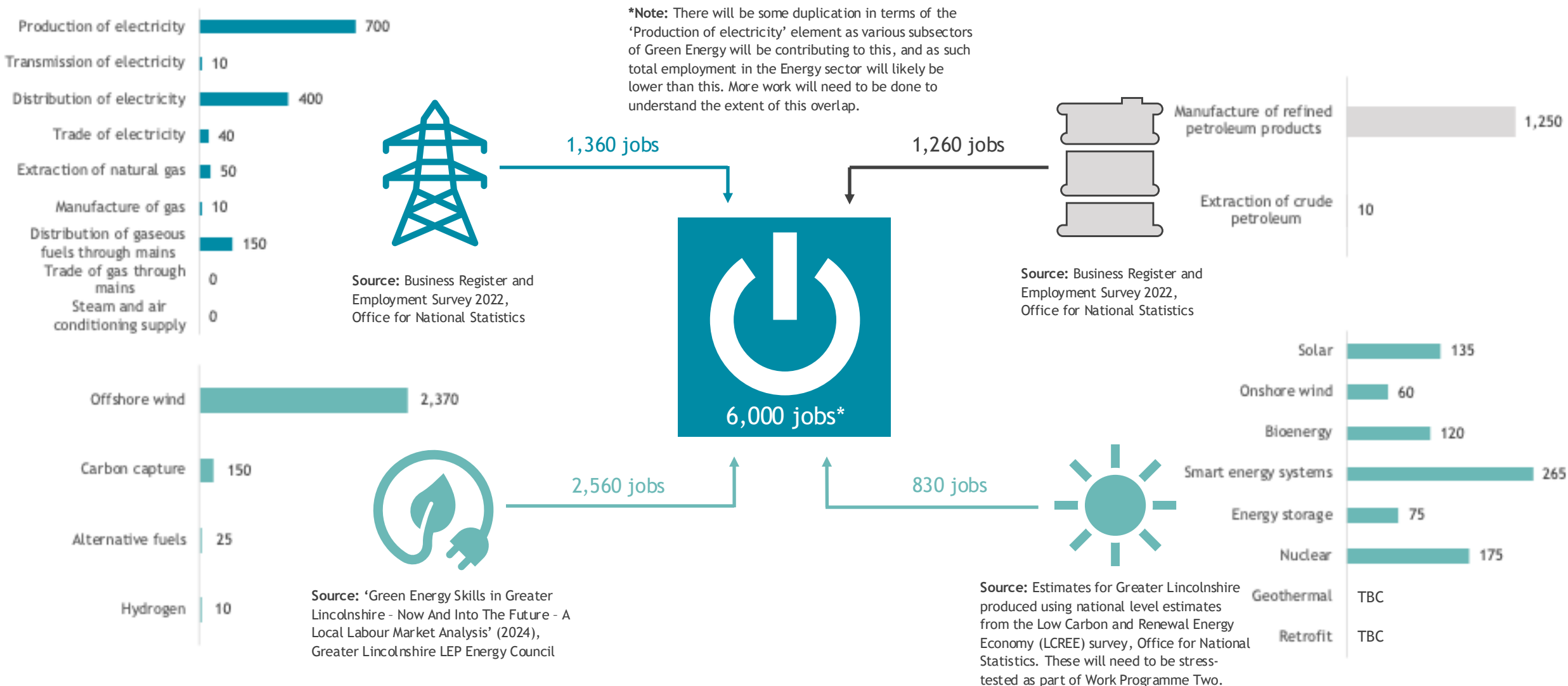
- Offshore wind
- Carbon capture
- Alternative fuels
- Hydrogen



Wider "Green Energy" sectors:

- Rooftop and/or floating solar
- Onshore wind
- Bioenergy
- Geothermal
- Retrofit
- Smart energy systems
- Energy storage
- Nuclear SMR/AMR

SIZE OF THE GREATER LINCOLNSHIRE ENERGY SECTOR - EMPLOYMENT



SIZE OF THE GREATER LINCOLNSHIRE ENERGY SECTOR - GROSS VALUE ADDED

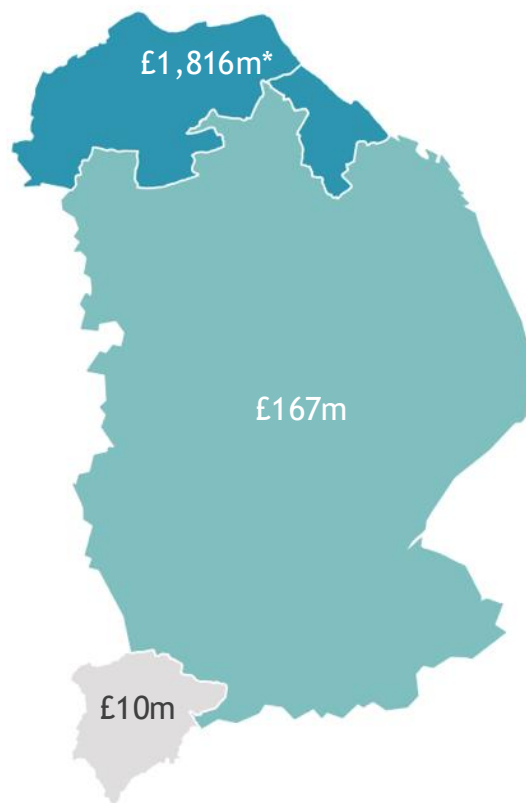


We estimate that the Greater Lincolnshire energy sector was worth £2bn (£1,993m) in 2022 based on current prices. This equates to seven per cent of Greater Lincolnshire's overall Gross Value Added (GVA - £30bn or £29,973m). The vast majority of this value is created by the mineral oil refining activity that takes place in Northern Lincolnshire, with this area accounting for 91 per cent of Greater Lincolnshire's Energy sector GVA.

Referring to the chart on the right then levels of GVA produced by the energy sector in Northern Lincolnshire have increased significantly over the last decade, driving the overall increase in GVA across the sector at a Greater Lincolnshire level. Rutland too has seen a modest increase in energy sector GVA levels over the same period whereas in Lincolnshire GVA for the sector currently sits at 2012 levels. Nationally, the energy sector has experienced a fall in GVA levels over the last decade.

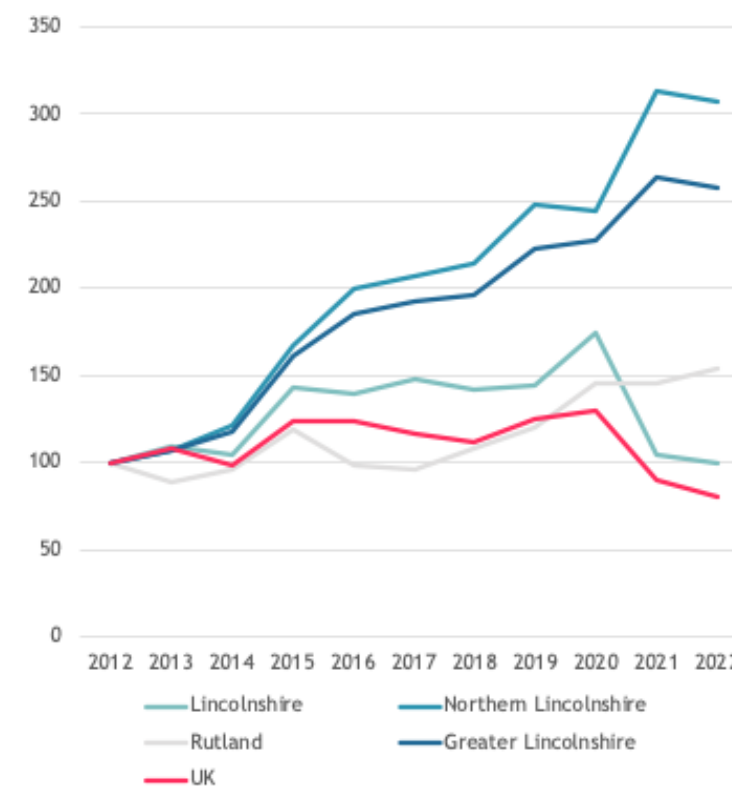
Source: Estimates produced by Codename:Consulting using information on Gross Value Added from the Office for National Statistics and Cambridge Econometrics Local Economy Forecasting Model

Energy sector GVA (current prices) across Greater Lincolnshire, 2022



* Figure covers Northern Lincolnshire i.e., North East Lincolnshire and North Lincolnshire

Index of Energy sector GVA over time using Constant Value Measure (CVM) prices (2019), (2012 = 100)



TOTAL NON-DOMESTIC ENERGY CONSUMPTION

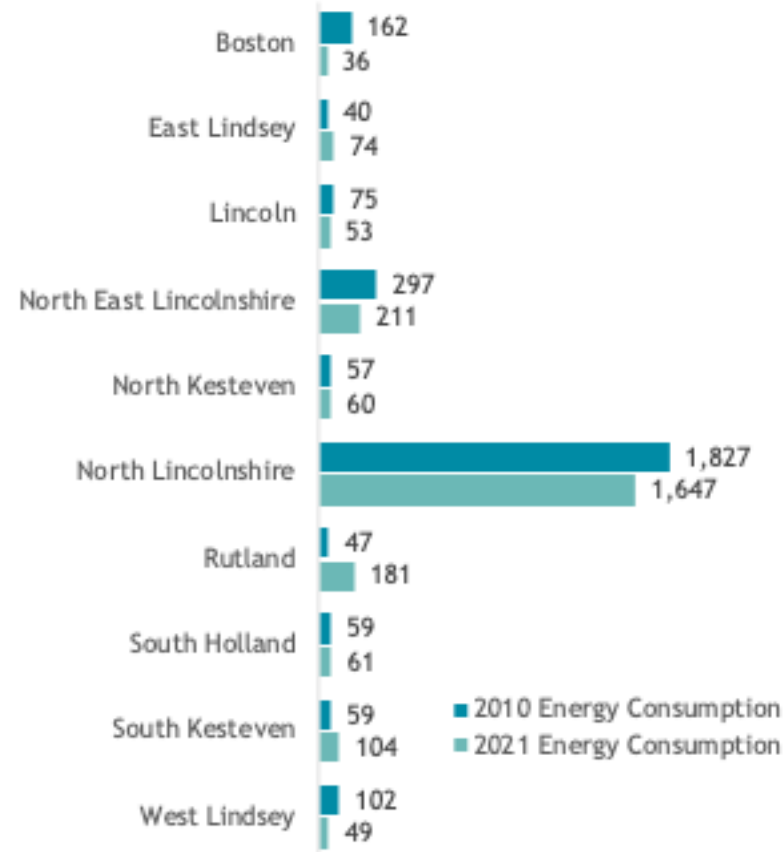


In 2021, total non-domestic energy consumption (not including road transport) in Greater Lincolnshire was 2,477 thousands of tonnes of oil equivalent (ktoe). This was 5.4 per cent of UK total non-domestic energy consumption (bearing in mind that Greater Lincolnshire supports c1.5 per cent of national employment and business numbers).

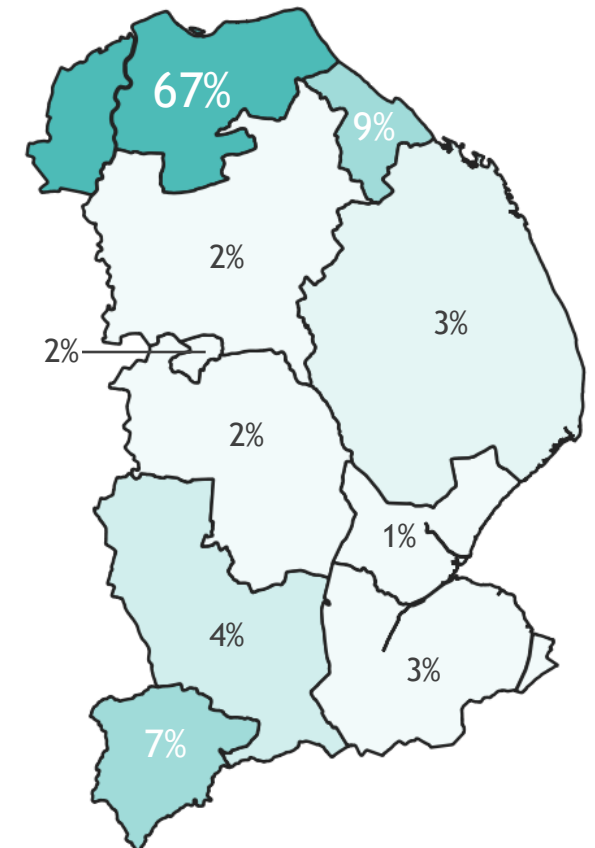
As both the chart and the image on the right show, of the unitary and district authorities that make up Greater Lincolnshire then non-domestic energy consumption is by far the highest in North Lincolnshire. This no doubt reflects the presence of the steel works as well as heavy industry concentrated on the South Humber bank (which can also be seen in North East Lincolnshire's relatively high non-domestic energy consumption figure).

Total non-domestic energy consumption in Greater Lincolnshire has fallen by nine per cent (from 2,725 ktoe) between 2010 and 2021. Nationally, total non-domestic energy consumption fell by 13 per cent over the same period. This overall fall in consumption is not uniform with some areas across Greater Lincolnshire experiencing an increase, most notably East Lindsey, Rutland, and South Kesteven.

Non-domestic energy consumption across Greater Lincolnshire in thousands of tonnes of oil equivalent (ktoe), 2010 and 2021



Greater Lincolnshire's total non-domestic energy consumption in 2021 apportioned across its constituent unitary and local authority areas



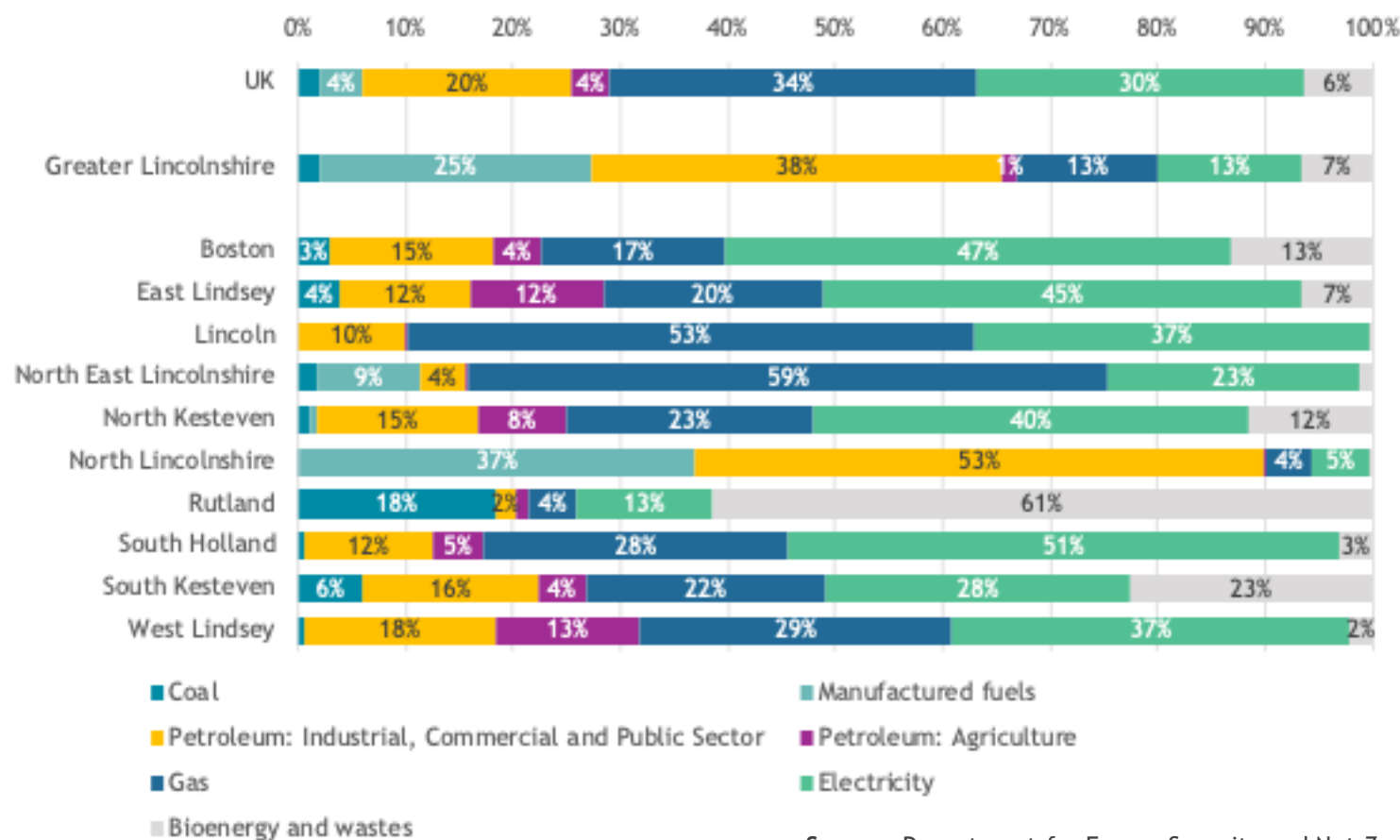
Source: Department for Energy Security and Net Zero

TOTAL NON-DOMESTIC ENERGY CONSUMPTION



The chart on the right shows how total non-domestic energy consumption is split by the various energy types. At a national level then gas (34 per cent) and electricity (30 per cent) make up nearly two thirds of non-domestic energy consumption. At a Greater Lincolnshire level then the mix of non-domestic energy consumption is very different with petroleum for industrial, commercial and public sector use (38 per cent) and manufactured fuels (25 per cent) accounting for 63 per cent of consumption whilst gas (13 per cent) and electricity (13 per cent) account for just over a quarter of consumption. This difference is being driven primarily by energy consumption by businesses in North Lincolnshire with all other unitary and local authority areas (barring Rutland where businesses are relying heavily on bioenergy and wastes) having a similar non-domestic energy consumption profile to that of the UK.

Total non-domestic energy consumption by type, 2022



Source: Department for Energy Security and Net Zero



NON-DOMESTIC CONSUMPTION OF ELECTRICITY

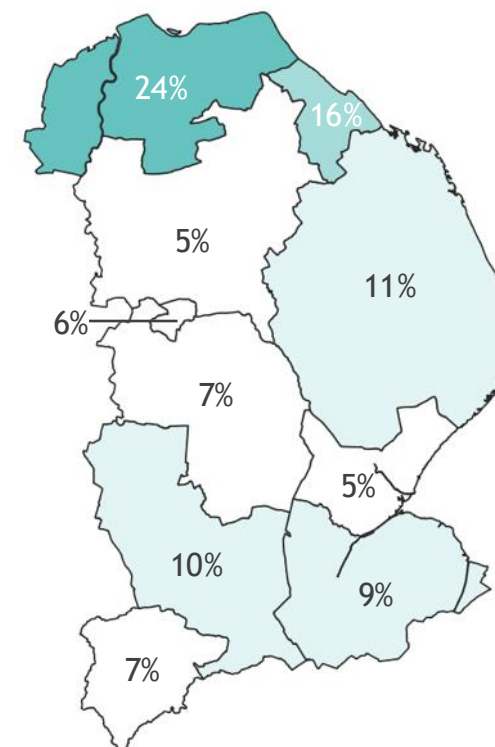
Greater Lincolnshire non-domestic properties consumed 3,518 GWh (Gigawatt hours) in total in 2022, 2.7 per cent of the England total. The highest levels of consumption were in North Lincolnshire and North East Lincolnshire which combined accounted for two fifths of non-domestic electricity consumption in Greater Lincolnshire during 2022.

Electricity consumption by non-domestic properties has fallen over time both locally and nationally. In 2010, electricity consumption by non-domestic properties in Greater Lincolnshire was 4,111 GWh meaning that by 2022 electricity consumption had fallen by 14 per cent. Nationally, electricity consumption by non-domestic properties had fallen by 15 per cent. Over this period all areas of Greater Lincolnshire saw reductions in non-domestic electricity consumption except South Holland where consumption rose by seven per cent.

Electricity consumption (GWh) by non-domestic properties across Greater Lincolnshire's unitary and local authority areas, 2022



Electricity consumption (GWh) by non-domestic properties apportioned across Greater Lincolnshire's unitary and local authority areas, 2022





NON-DOMESTIC CONSUMPTION OF ELECTRICITY

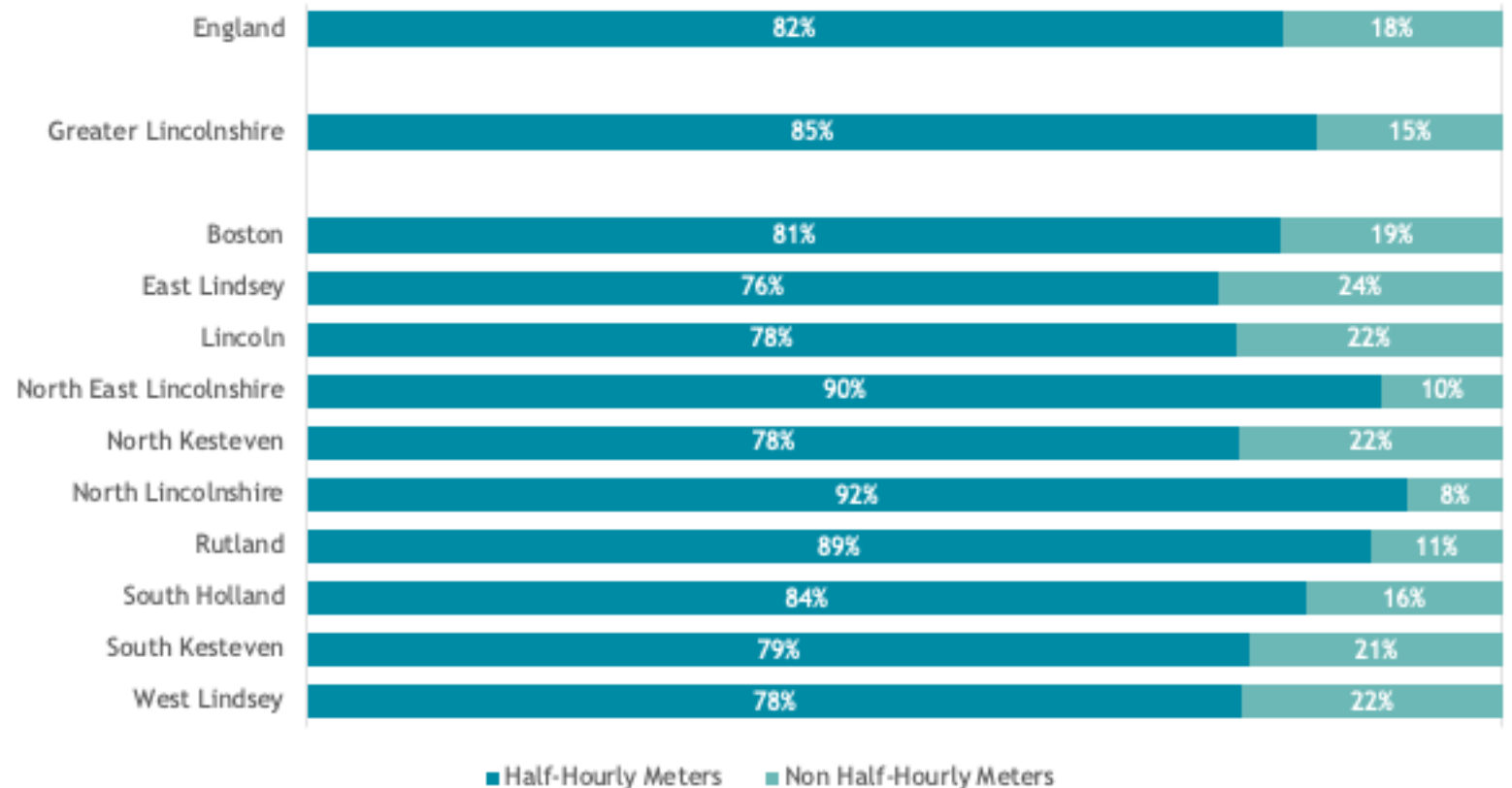
Electricity consumption data is divided between domestic and non-domestic categories according to the meter's profile class. Domestic consumption is based on Non-Half Hourly (NHH) meters with profiles 1 and 2 (these are the standard domestic and economy 7 tariffs respectively). Non-domestic consumption is based on NHH meters with profiles 3 to 8 and all Half Hourly meters. In addition, profile 1 and 2 meters are re-allocated to the non-domestic sector if their annual consumption is greater than 100,000 kWh; or if their annual consumption is greater than 50,000 kWh and the address information for meter suggests that it is non-domestic.

As the chart on the right demonstrates, the majority of non-domestic electricity consumption is via half hourly meters both locally and nationally.

Total non-domestic consumption of electricity via half hourly meters in Greater Lincolnshire in 2022 was 2,974 GWh, down from 3,135 GWh in 2010.

Total non-domestic consumption of electricity via non-half hourly meters in Greater Lincolnshire in 2022 was 545 GWh, down from 923 GWh in 2010.

Non-domestic electricity consumption by half hourly and non-half hourly meters, 2022



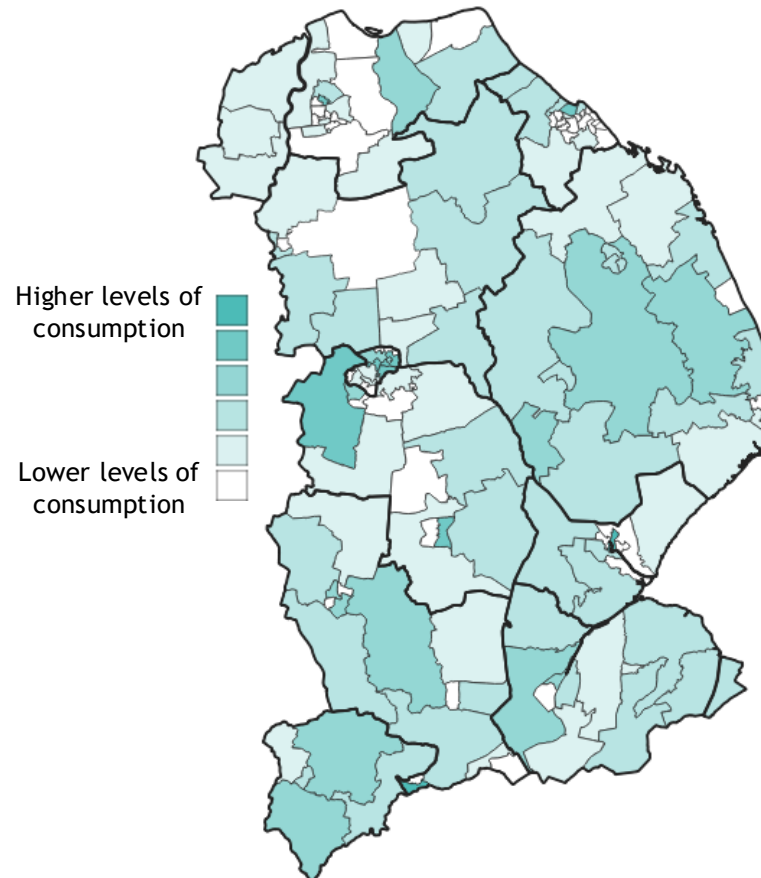
Source: Department for Energy Security and Net Zero



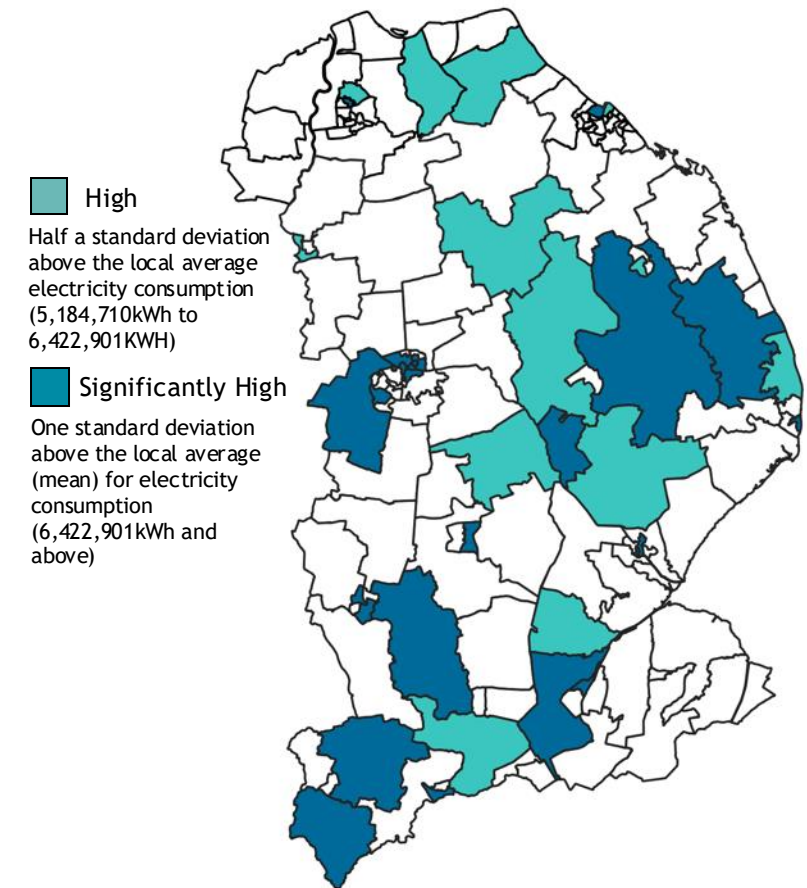
NON-DOMESTIC CONSUMPTION OF ELECTRICITY

The image on the right shows levels of non-domestic electricity consumption via non-half hourly meters only across Greater Lincolnshire using data at Middle Super Output Area (MSOA). Crucially in terms of our analysis for non-domestic consumption at Middle Super Output Area (MSOA) level, half hourly meter points (which are higher-consuming non-domestic customers) totals are not included at MSOA level but are included at the local authority level. This means that the following sub-district analysis (slides 12 to 21) of non-domestic electricity consumption is essentially focused upon small to medium sized businesses with the assumption being that the higher-consuming non-domestic customers will be the largest businesses. So, using this non-half hourly meter data the following slides (one per unitary / lower tier local authority area) identify areas of 'high' and 'significantly high' electricity consumption, as well as business clusters based on the Greater Lincolnshire LEPs identified 'game changing' sectors, along with substation demand data from the two Distribution Network Operators (DNOs) that cover the Greater Lincolnshire area, namely Northern Power Grid and National Grid.

Electricity consumption (GWh) by non-domestic properties via non-half hourly meters across Greater Lincolnshire, 2022



Areas of 'high' and 'significantly high' electricity consumption (GWh) by non-domestic properties via non-half hourly meters across Greater Lincolnshire, 2022

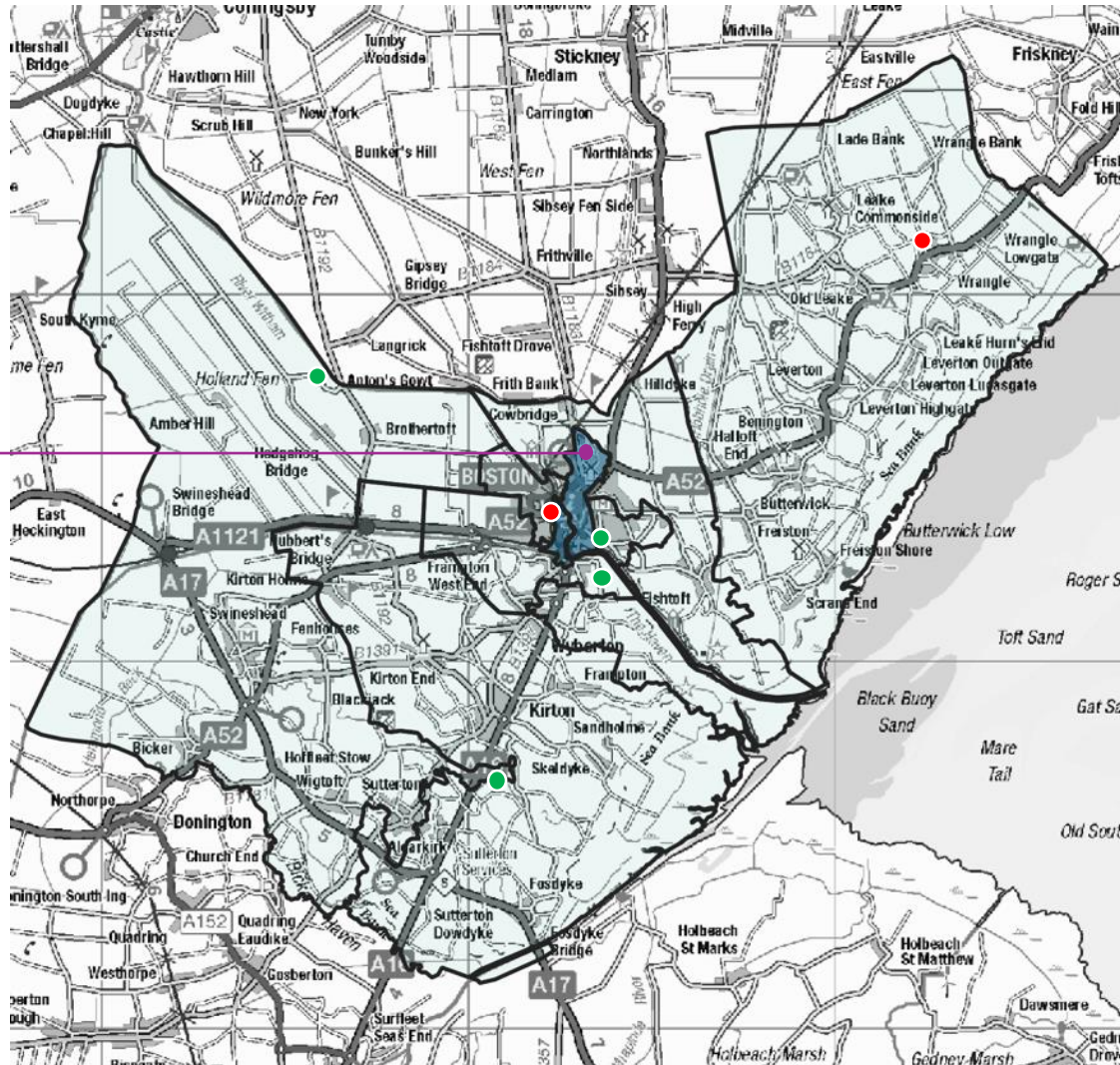


Source: Department for Energy Security and Net Zero

BOSTON



MSOA - E02005419
 Business Clusters: Health & Care - 50;
 Ports & Logistics - 65; Visitor Economy - 155



- Significantly High
One standard deviation above the average (mean) for electricity consumption (6,422,901kWh and above)
- High
Half a standard deviation above the average electricity consumption (5,184,710kWh to 6,422,901KWH)
- Substation Demand Classification - At capacity
- Substation Demand Classification - Close to capacity
- Substation Demand Classification - Spare capacity
- Substation Demand Classification - None provided

Sources: UK Business Counts, 2023, Office for National Statistics; Subnational electricity consumption statistics, Department for Energy Security and Net Zero; National Grid



EAST LINDSEY

MSOA - E02005427

Business Clusters: Health & Care - 30;
Visitor Economy - 80

MSOA - E02005432

Business Cluster: AgriFood - 185; Energy - 5

MSOA - E02005430

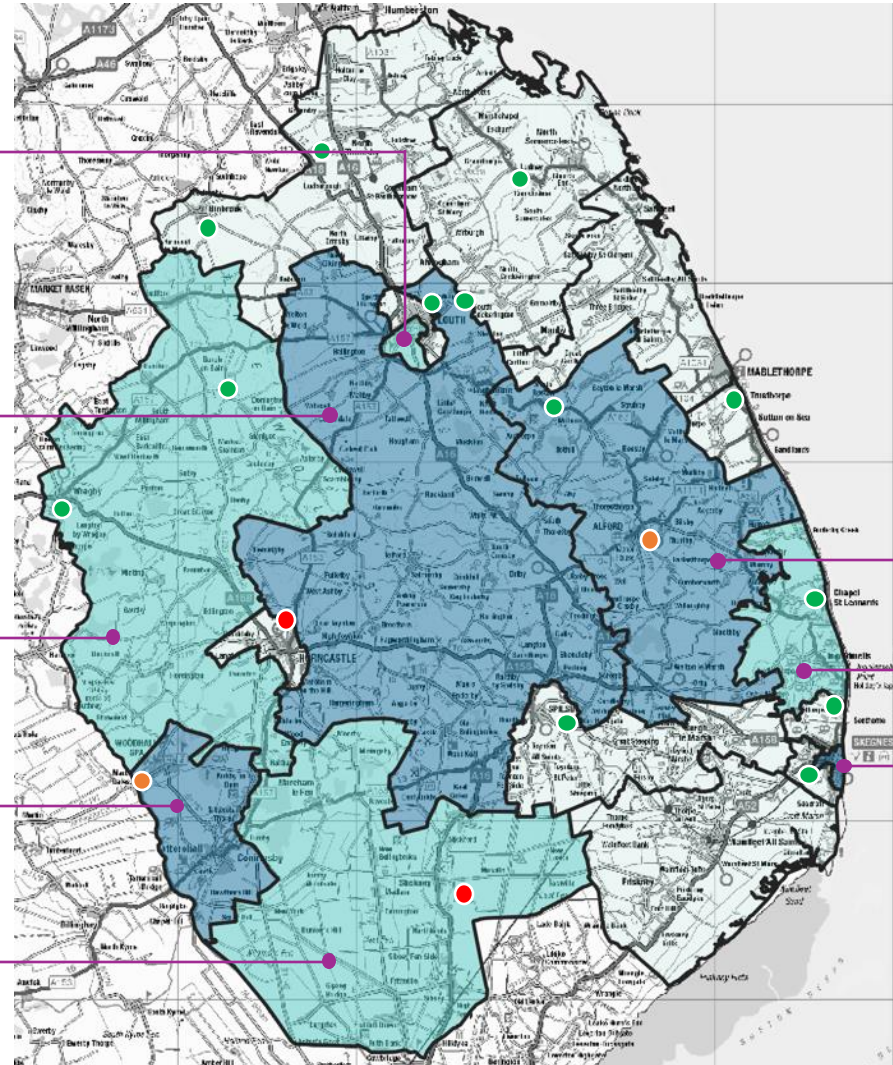
Business Cluster: AgriFood - 210

MSOA - E02005439

Business Clusters: Health & Care - 30; Visitor Economy - 80

MSOA - E02005441

Business Clusters: AgriFood - 115; Manufacturing - 15



Significantly High

One standard deviation above the average (mean) for electricity consumption (6,422,901kWh and above)

High

Half a standard deviation above the average electricity consumption (5,184,710kWh to 6,422,901KWH)

- Substation Demand Classification - At capacity
- Substation Demand Classification - Close to capacity
- Substation Demand Classification - Spare capacity
- Substation Demand Classification - None provided

MSOA - E02005431

Business Clusters: AgriFood - 105; Defence - 5;
Manufacturing - 10

MSOA - E02005433

Business Cluster: Visitor Economy - 130

MSOA - E02005437

Business Clusters: Health & Care - 35;
Manufacturing - 10; Visitor Economy - 140

Sources: UK Business Counts, 2023, Office for National Statistics; Subnational electricity consumption statistics, Department for Energy Security and Net Zero; National Grid; Northern Power Grid



LINCOLN

MSOA - E02005445

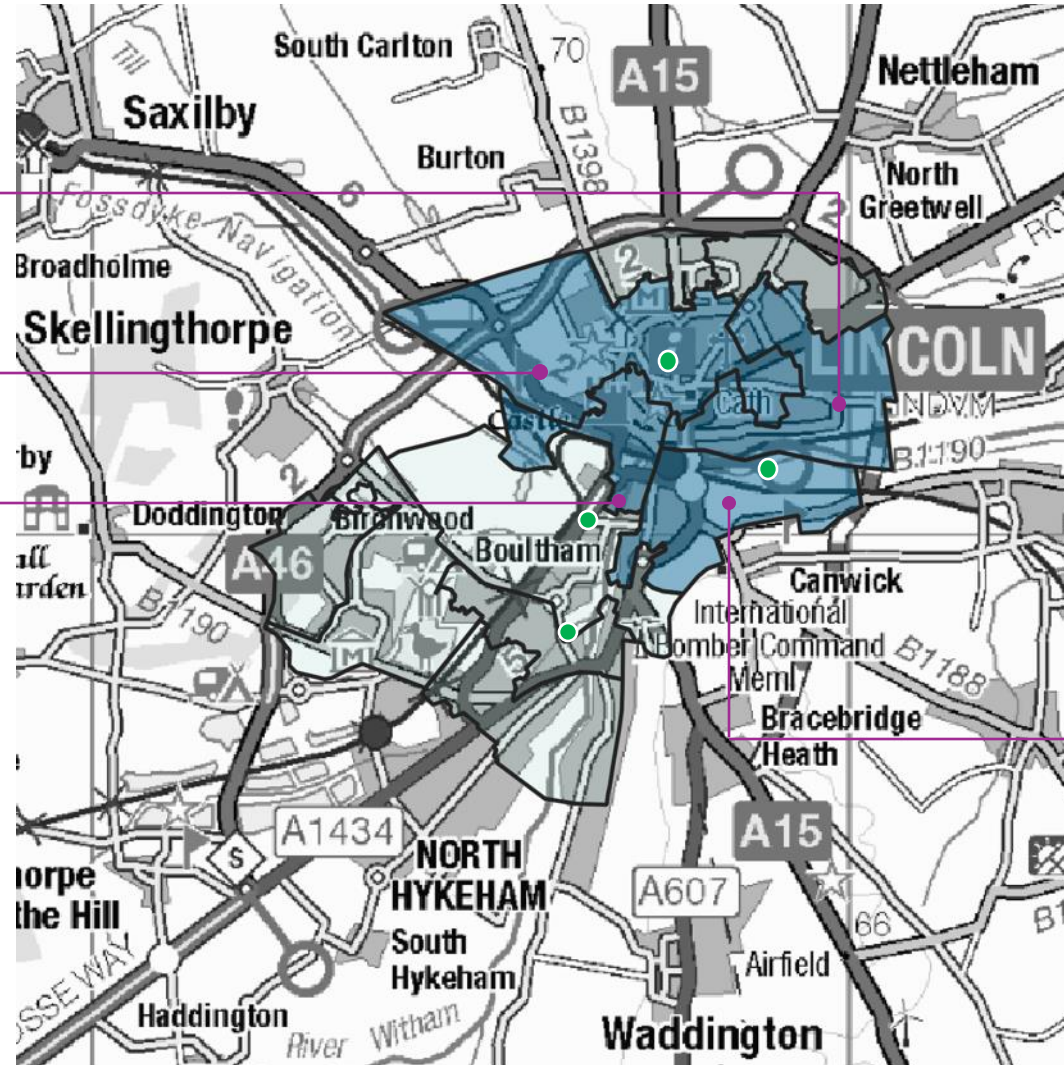
Business Clusters: Defence - 5; Health & Care - 40; Manufacturing - 15; Visitor Economy - 85

MSOA - E02005444

Business Clusters: Defence - 5; Health & Care - 65; Visitor Economy - 95

MSOA - E02005446

Business Clusters: Defence - 5; Energy - 5; Health & Care - 50; Visitor Economy - 135



Significantly High

One standard deviation above the average (mean) for electricity consumption (6,422,901kWh and above)



High

Half a standard deviation above the average electricity consumption (5,184,710kWh to 6,422,901KWH)



Substation Demand Classification - At capacity



Substation Demand Classification - Close to capacity



Substation Demand Classification - Spare capacity



Substation Demand Classification - None provided

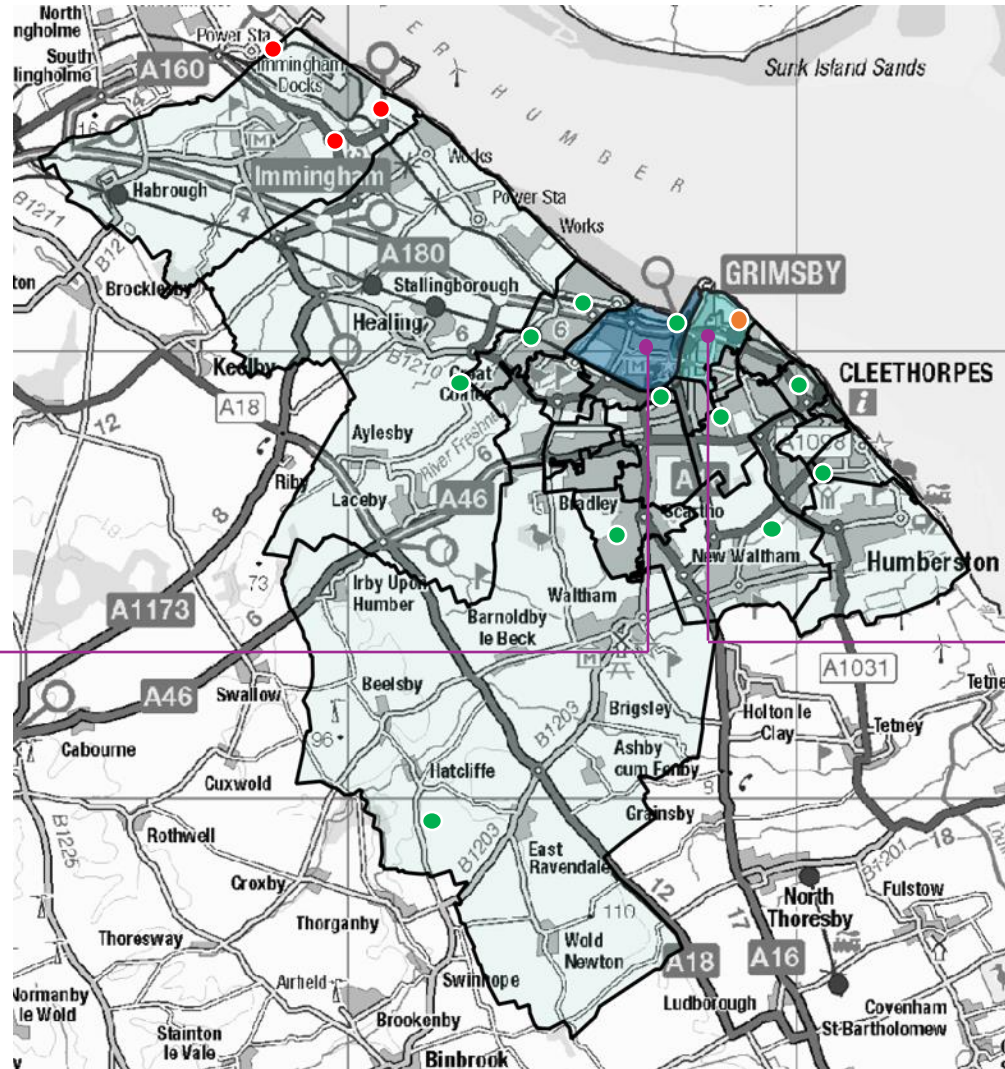
MSOA - E02005447

Business Clusters: Energy - 10; Health & Care - 30; Manufacturing - 15

Sources: UK Business Counts, 2023, Office for National Statistics; Subnational electricity consumption statistics, Department for Energy Security and Net Zero; National Grid



NORTH EAST LINCOLNSHIRE



- Significantly High**
One standard deviation above the average (mean) for electricity consumption (6,422,901kWh and above)
- High**
Half a standard deviation above the average electricity consumption (5,184,710kWh to 6,422,901KWH)
- Substation Demand Classification - At capacity
- Substation Demand Classification - Close to capacity
- Substation Demand Classification - Spare capacity
- Substation Demand Classification - None provided

MSOA - E02002728

Business Clusters: Defence - 5; Manufacturing - 15; Ports & Logistics - 70; Visitor Economy - 90

MSOA - E02002727

Business Clusters: Energy - 5; Health & Care - 45; Manufacturing - 20

Sources: UK Business Counts, 2023, Office for National Statistics; Subnational electricity consumption statistics, Department for Energy Security and Net Zero; Northern Power Grid



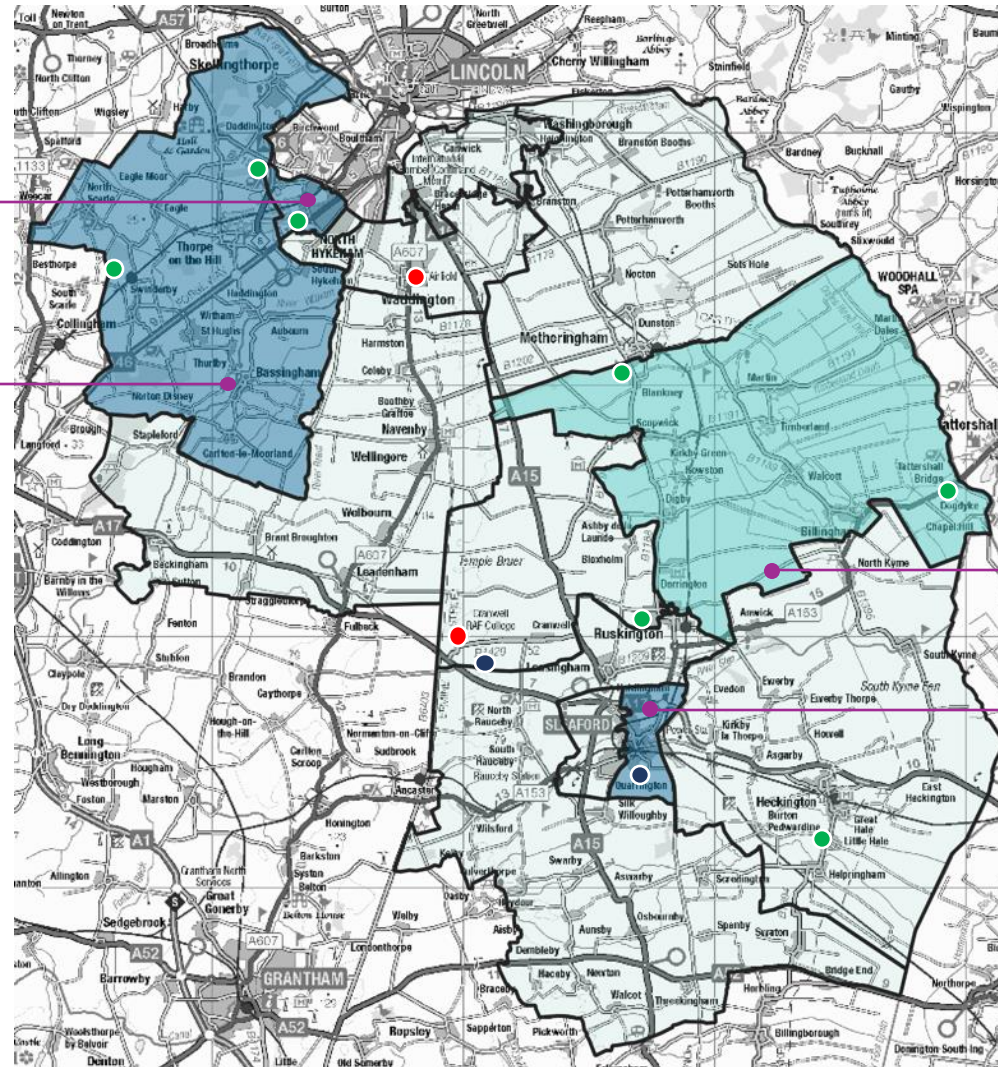
NORTH KESTEVEN

MSOA - E02005867

Business Clusters: Defence - 5; Manufacturing - 20;

MSOA - E02005455

Business Clusters: AgriFood - 95; Health & Care - 30; Manufacturing - 25; Visitor Economy - 75



Significantly High



High



Substation Demand Classification - At capacity



Substation Demand Classification - Close to capacity



Substation Demand Classification - Spare capacity



Substation Demand Classification - None provided

MSOA - E02005459

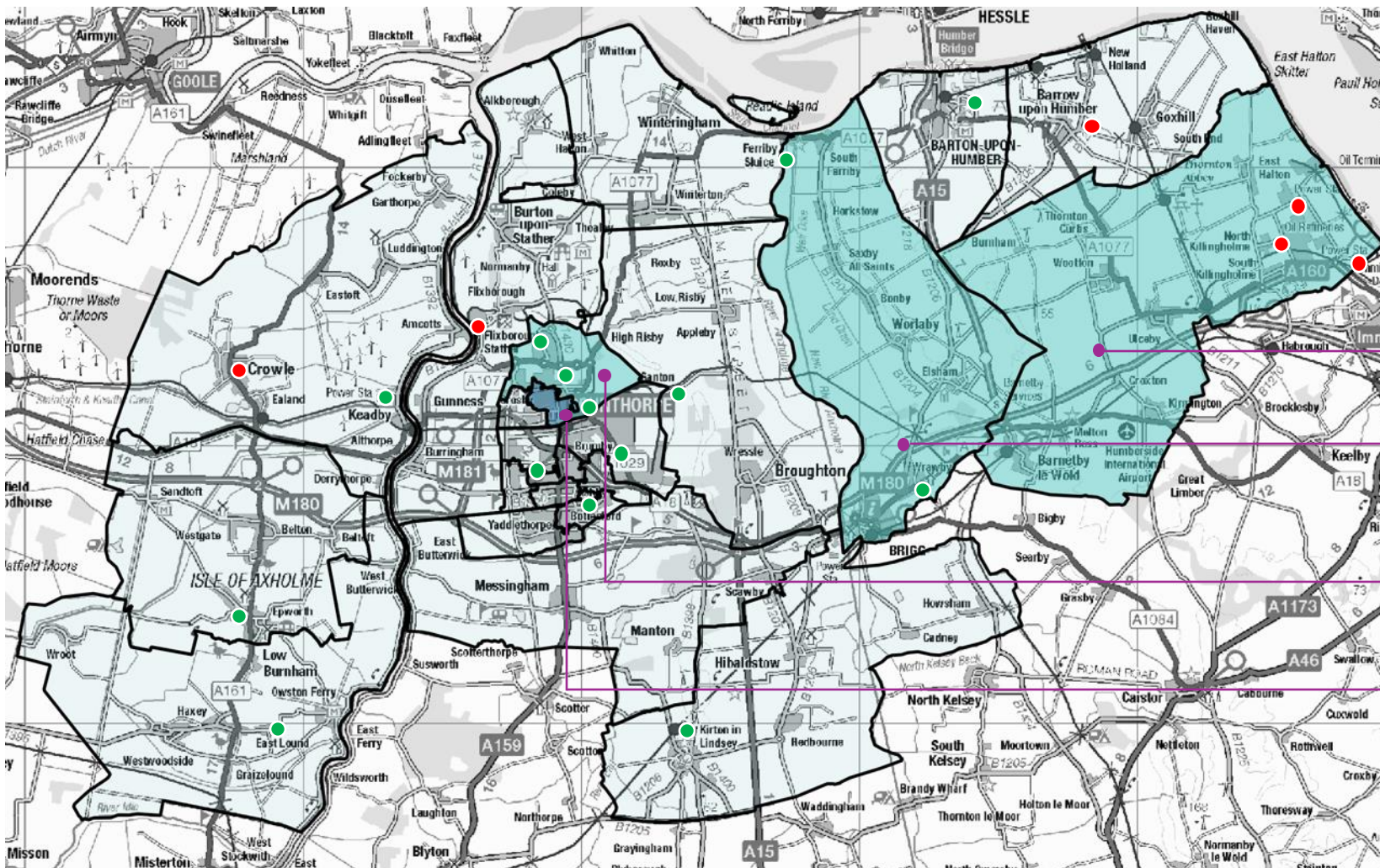
Business Cluster: AgriFood - 90

MSOA - E02005462

Business Clusters: Health & Care - 45; Manufacturing - 15; Visitor Economy - 85

Sources: UK Business Counts, 2023, Office for National Statistics; Subnational electricity consumption statistics, Department for Energy Security and Net Zero; National Grid

NORTH LINCOLNSHIRE



- Significantly High** One standard deviation above the average (mean) for electricity consumption (6,422,901kWh and above)
- High** Half a standard deviation above the average electricity consumption (5,184,710kWh to 6,422,901kWh)
- Substation Demand Classification - At capacity**
- Substation Demand Classification - Close to capacity**
- Substation Demand Classification - Spare capacity**
- Substation Demand Classification - None provided**

- MSOA - E02002752**
Business Clusters: Energy - 10; Manufacturing - 15; Ports & Logistics - 75
- MSOA - E02002759**
Business Clusters: Manufacturing - 15; Visitor Economy - 85
- MSOA - E02002755**
Business Clusters: Energy - 10; Health & Care - 65; Manufacturing - 20; Ports & Logistics - 70
- MSOA - E02002756**
Business Clusters: Defence - 5; Health & Care - 40; Ports & Logistics - 95; Visitor Economy - 110

Sources: UK Business Counts, 2023, Office for National Statistics; Subnational electricity consumption statistics, Department for Energy Security and Net Zero; Northern Power Grid

RUTLAND

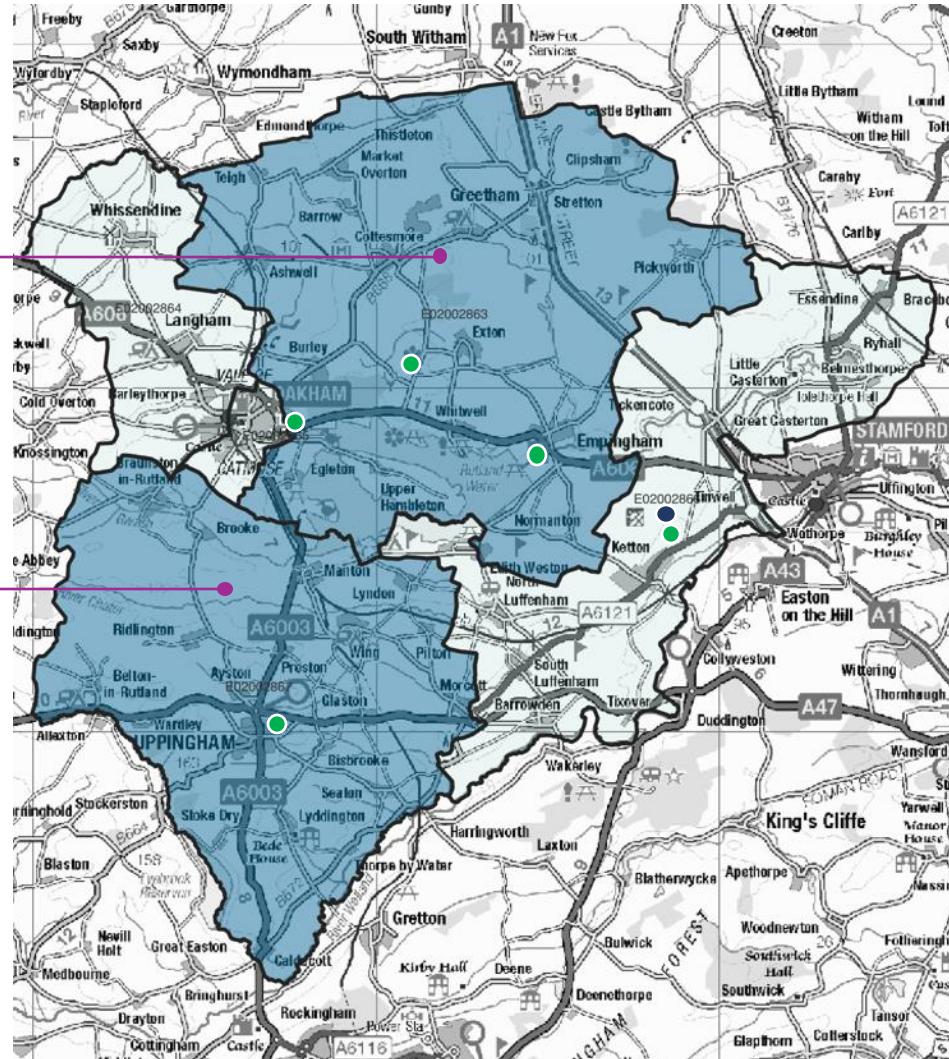


MSOA - E02002863

Business Clusters: AgriFood - 65; Visitor Economy - 65

MSOA - E02002867

Business Clusters: AgriFood - 65; Defence - 5; Manufacturing - 10



Significantly High

One standard deviation above the average (mean) for electricity consumption (6,422,901kWh and above)

High

Half a standard deviation above the average electricity consumption (5,184,710kWh to 6,422,901KWH)

- Substation Demand Classification - At capacity
- Substation Demand Classification - Close to capacity
- Substation Demand Classification - Spare capacity
- Substation Demand Classification - None provided

Sources: UK Business Counts, 2023, Office for National Statistics; Subnational electricity consumption statistics, Department for Energy Security and Net Zero; National Grid



SOUTH HOLLAND

- Significantly High** One standard deviation above the average (mean) for electricity consumption (6,422,901kWh and above)
- High** Half a standard deviation above the average electricity consumption (5,184,710kWh to 6,422,901KWH)
- Substation Demand Classification - At capacity
- Substation Demand Classification - Close to capacity
- Substation Demand Classification - Spare capacity
- Substation Demand Classification - None provided

MSOA - E02005465

Business Cluster: AgriFood - 85

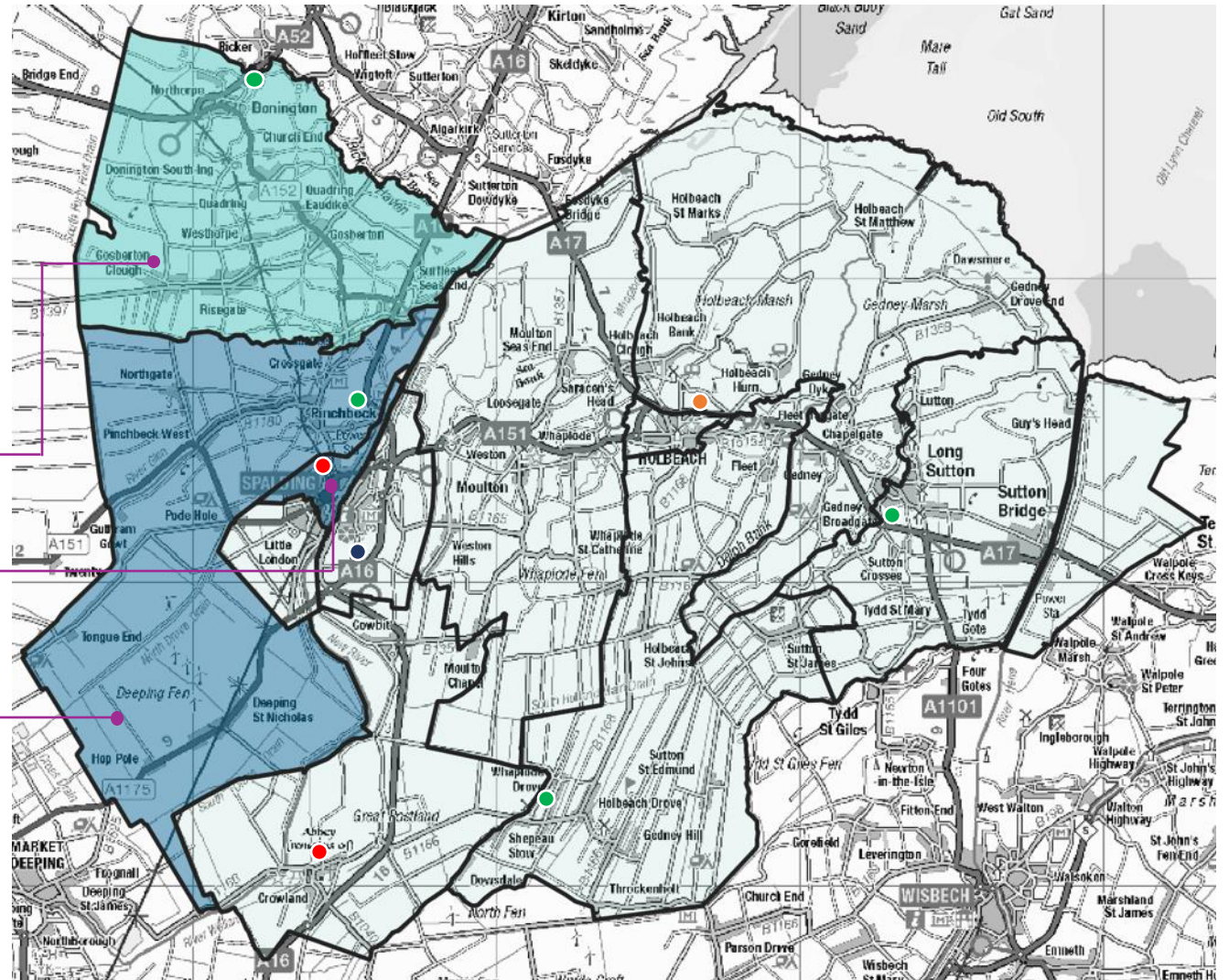
MSOA - E02005470

Business Clusters: Defence - 5; Health & Care - 35;
Ports & Logistics - 245; Visitor Economy - 95

MSOA - E02005469

Business Clusters: AgriFood - 100; Manufacturing - 15;
Ports & Logistics - 55

Sources: UK Business Counts, 2023, Office for National Statistics;
Subnational electricity consumption statistics, Department for Energy Security and Net Zero; National Grid





SOUTH KESTEVEN

MSOA - E02005479

Business Clusters: Health & Care - 30;
Ports & Logistics - 55; Visitor Economy - 105

MSOA - E02005481

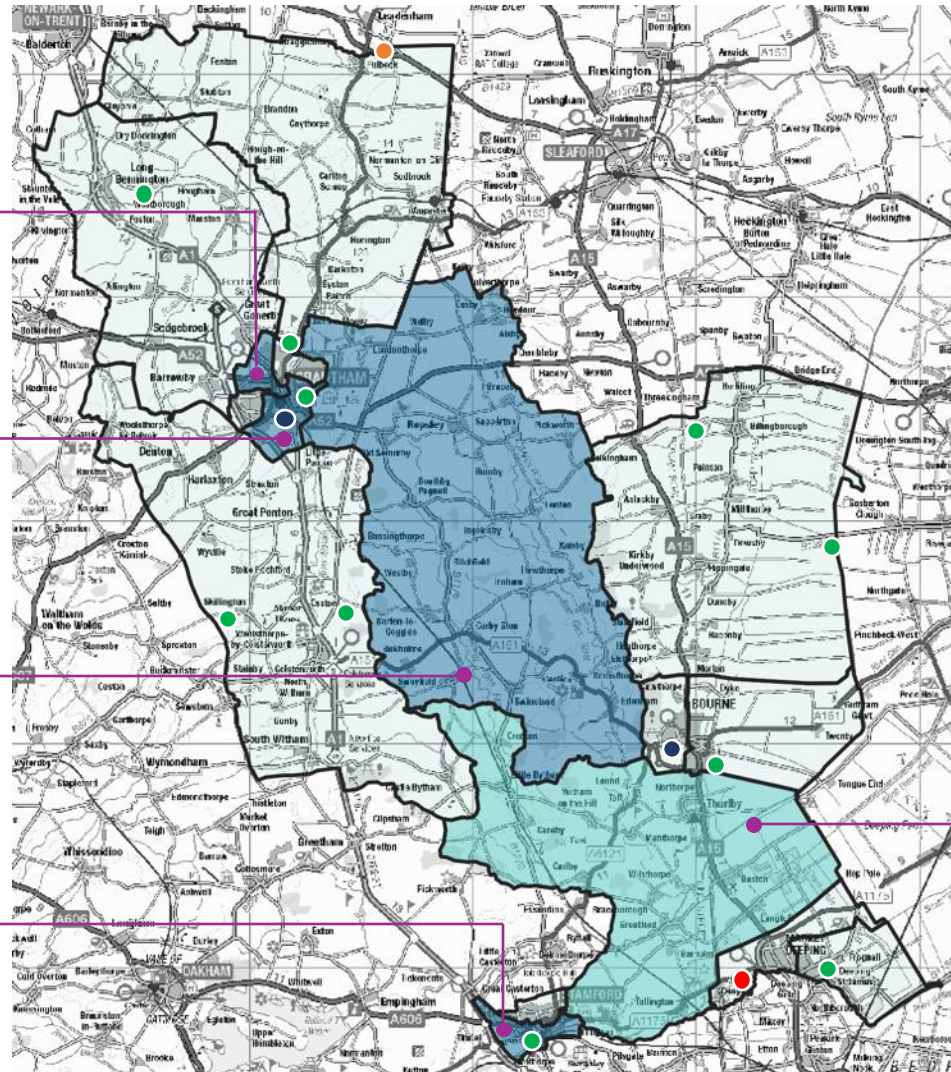
Business Clusters: Defence - 10; Energy - 10;
Health & Care - 50

MSOA - E02005482

Business Clusters: AgriFood - 70; Manufacturing - 15

MSOA - E02005491

Business Clusters: Defence - 5; Energy - 5; Health & Care - 60; Manufacturing - 15; Visitor Economy - 140



Significantly High

One standard deviation above the average (mean) for electricity consumption (6,422,901kWh and above)

High

Half a standard deviation above the average electricity consumption (5,184,710kWh to 6,422,901KWH)

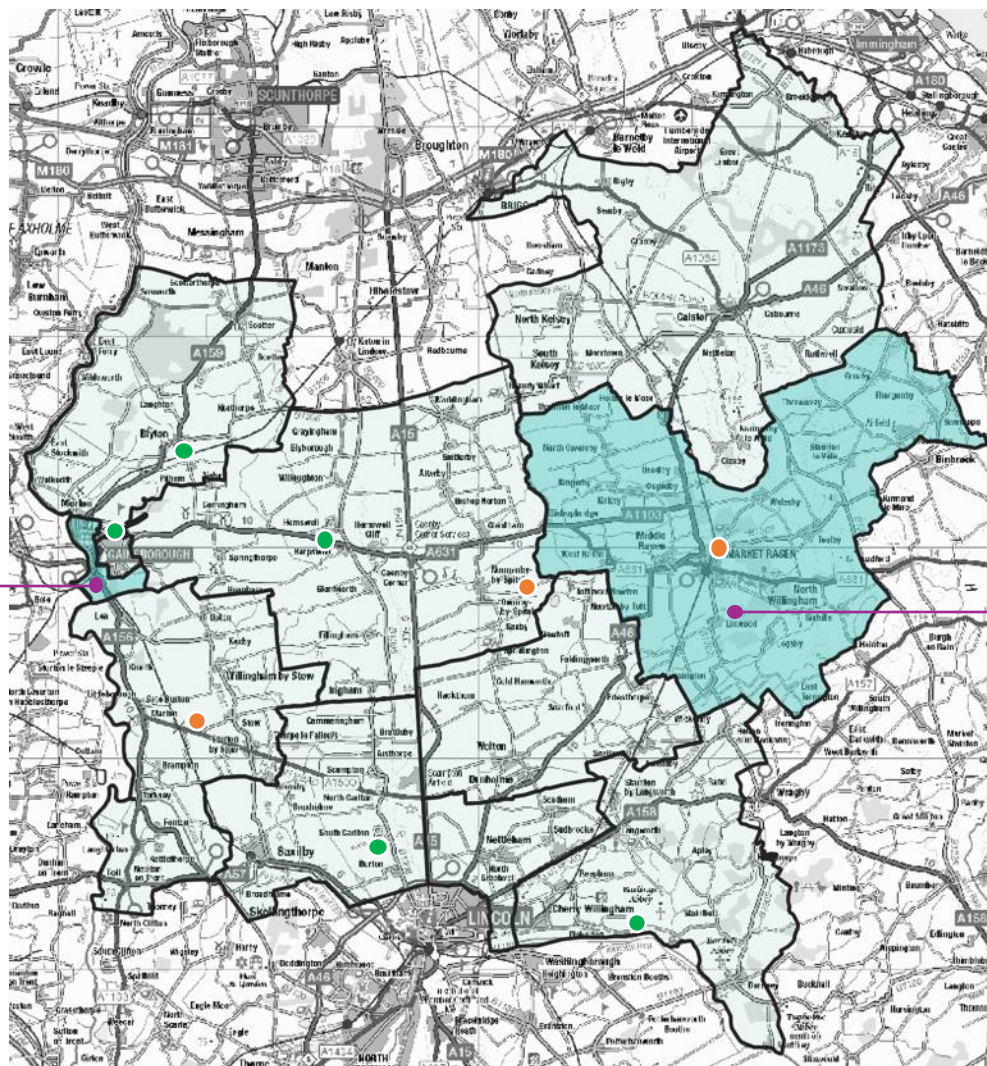
- Substation Demand Classification - At capacity
- Substation Demand Classification - Close to capacity
- Substation Demand Classification - Spare capacity
- Substation Demand Classification - None provided

MSOA - E02005487

Business Clusters: AgriFood - 70; Energy - 5;
Manufacturing - 10

Sources: UK Business Counts, 2023, Office for National Statistics; Subnational electricity consumption statistics, Department for Energy Security and Net Zero; National Grid

WEST LINDSEY



- Significantly High
One standard deviation above the average (mean) for electricity consumption (6,422,901kWh and above)
- High
Half a standard deviation above the average electricity consumption (5,184,710kWh to 6,422,901KWH)
- Substation Demand Classification - At capacity
- Substation Demand Classification - Close to capacity
- Substation Demand Classification - Spare capacity
- Substation Demand Classification - None provided

MSOA - E02005495
 Business Clusters: Energy - 5; Health & Care - 45

MSOA - E02005494
 Business Cluster: AgriFood - 120

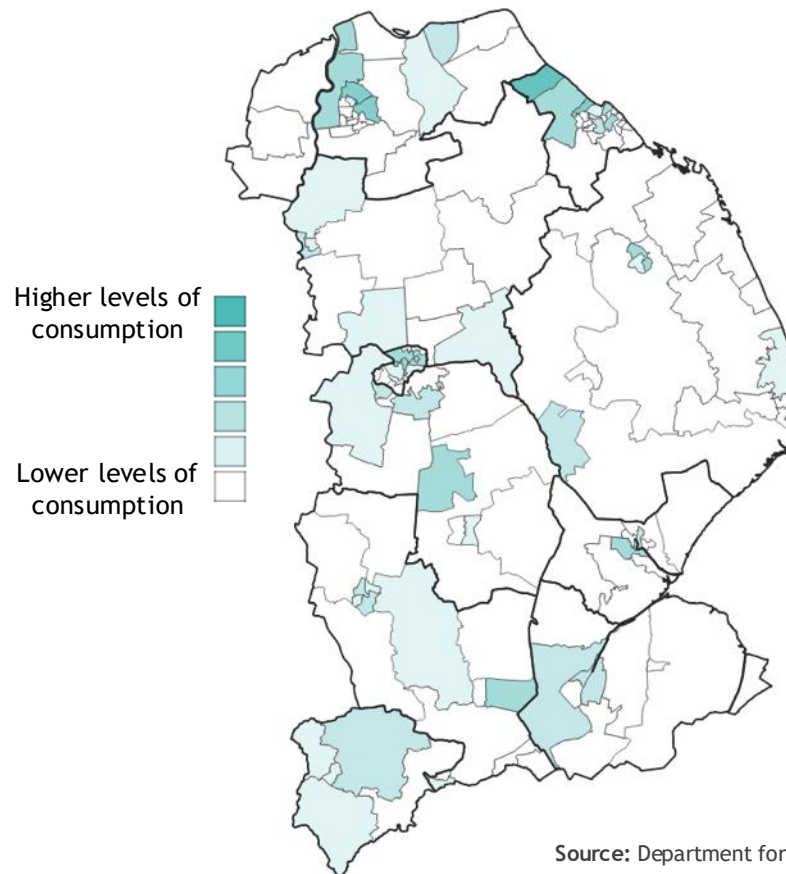
Sources: UK Business Counts, 2023, Office for National Statistics; Subnational electricity consumption statistics, Department for Energy Security and Net Zero; National Grid; Northern Power Grid



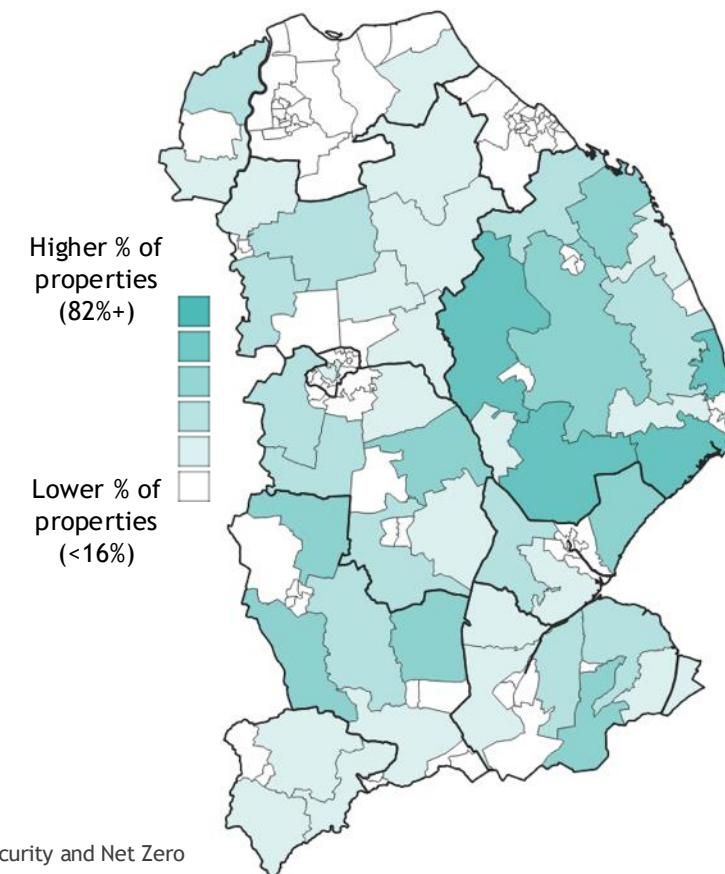
NON-DOMESTIC PROPERTIES NOT ON THE GAS GRID

Whilst detailed small area data on domestic properties that are not on the gas grid is readily available via open licence via the Department for Energy Security and Net Zero, this is not the case for non-domestic properties. Instead, and in order to identify areas where non-domestic properties across Greater Lincolnshire are not on the gas grid, we are reliant on non-domestic gas consumption data alongside data on domestic properties not on the gas grid (with the assumption being that areas with higher numbers of properties not on the gas grid will be the same for both domestic and non-domestic). So, referring to the two images on the right which demonstrate this data, unsurprisingly it is the larger rural areas of Greater Lincolnshire where non-domestic gas consumption is lowest and where the number of properties not connected to the gas network is highest - East Lindsey particularly stands out in this respect. In fact, all four of the areas where the proportion of properties not on the gas grid is 82 per cent or above are in East Lindsey. These areas also contain 1,420 businesses.

Gas consumption by non-domestic properties across Greater Lincolnshire, 2022



Domestic properties not on the gas grid across Greater Lincolnshire, 2022



Source: Department for Energy Security and Net Zero