Greater Lincolnshire LEP Energy Council

Teams Meeting – LEP Energy Council Meeting

Date: 9th June 2021 at 2.00pm

Join Teams Meeting

Paper 0 - Agenda

Time	Item and brief description	Lead	Status
14.00	Welcome and Formal Introductions	Duncan Botting	Verbal
14.10	Discussion around recent announcements from Western Power and Northern Powergrid Green Revival Fund announcements. Please see link details below.	Duncan Botting/All	Presentation/Discussion
14.50	Discussions around the Energy Open Data Paper attached- Please see discussion details below	All	Paper/Discussion
15.10	Energy Council Future Focus discussions, following on from the agreed areas to concentrate on at the last meeting	Duncan Botting/All	Verbal/Discussion
16.00	Standing item proposal around LAEP/Regional activities. This will include the funding now going into Humber/Town Plan Deals/ Agri-Food, and others	Duncan Botting/All	Verbal/Discussion
16.25	AOB	All	Verbal/Discussion
16.30	Meeting Close		

Attendees: Duncan Botting, Justin Brown, John Henry Looney, Simon Green, Sally Brewis, Juergen Schaper, Emma Bridge, Martin Haworth, Lea James, Jacqui Bunce, Alex Riley, Robert Rowan, Mark Hutchinson

Apologies:

Tentative:

Officers: Ruth Carver, Andrew Brooks

Future focus of Energy Council - *Pre meeting action*

The recent announcements on the Green Revival Funding for the Greater Lincolnshire area can be found here:
- **Western Power Distribution** - https://www.westernpower.co.uk/green-recovery/ You will need to scroll down to the interactive map
- **Northern Powergrid** - https://www.northernpowergrid.com/green-recovery

Energy Open Data – *Pre meeting action*

There is a separate paper for discussion on this subject.

Local Area Energy Planning – *Pre meeting action*

The areas of focus identified at the last meeting to take forward for further planning work include

- **Local Area Energy Plan's** – There was a unanimous view that the process of gaining a credible evidence base, from which you can take deep dives in to specific place based issues and development, was both vital and needed to be carried out immediately.   The view around the Infrastructure Group proposals is that it was a subset of what is needed, but would be difficult to deliver without the wider approach
- **Digital Connectivity** – The importance of getting this right, in terms of energy is paramount. Without the infrastructure and innovation to power data delivery and application, generation, storage and distribution, plus mobility will be impossible to deliver, against a backdrop of net zero and decarbonisation
- **Clean Growth –** Discussions centered around a strategy which would supercharge the right market place to deliver GVA, productivity and growth for Greater Lincolnshire

Public Inquiry into The Informational Needs on Energy in Greater Lincolnshire

Executive Summary

Based on the initial public inquiry on the data needs of stakeholders, the following headline findings have emerged as key for organisations using data to improve services in the Energy Sector in Greater Lincolnshire:

- There is a wealth of data available on the subject of Energy but they are made inaccessible by both the mode of their publication and the format in which they are produced in. Stakeholders seeking to use data to deliver better energy services in Greater Lincolnshire are faced with overwhelming barriers to doing so.
- The overwhelming perception of data for energy services is that it is inaccessible and unusable to a lay person. This directly harms businesses and stifles innovation.
- End users are not provided with adequate information from the data available to them to make decisions with regards to the energy needs of their businesses.
- End users are not sufficiently involved in data-driven energy initiatives to make a meaningful impact on the design or take-up of the initiative.
- Like with Health and Social Care, the digital divide is a real and significant barrier to innovation in the energy sector. Any intervention must seek to close the digital divide in a meaningful way.
- Understanding the overlap between energy, heat, and water is a crucial aspect of getting the data necessary to make decisions to any stakeholder.
- The ways in which data is produced and collated for projects is economically unfeasible, which in turn stifles innovation.
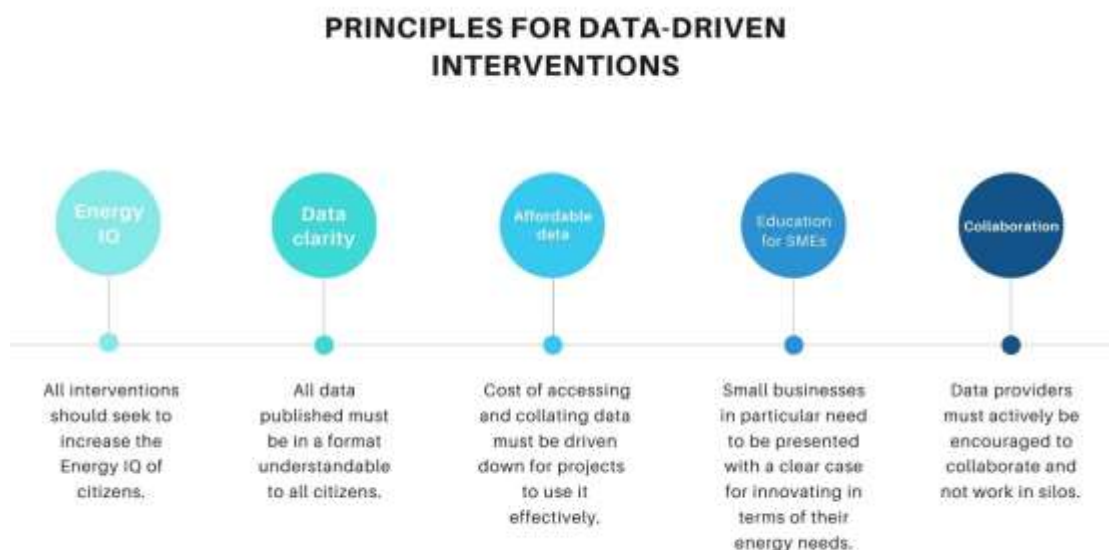

PRINCIPLES FOR DATA-DRIVEN INTERVENTIONS

Energy IQ	Data clarity	Affordable data	Education for SMEs	Collaboration
All interventions should seek to increase the Energy IQ of citizens.	All data published must be in a format understandable to all citizens.	Cost of accessing and collating data must be driven down for projects to use it effectively.	Small businesses in particular need to be presented with a clear case for innovating in terms of their energy needs.	Data providers must actively be encouraged to collaborate and not work in silos.

Figure 1: How might data-driven interventions be made more accessible

Background

This report follows up on research done in January-March 2020 by the Lincolnshire Open Research and Innovation Centre. It has been commissioned by the Lincolnshire County Council and the Greater Lincolnshire Local Enterprise Partnership. It is a thematic representation of three public focus groups held between December 2020 and January 2021 with stakeholders in the Lincolnshire energy sector.

The aims of this inquiry are as follows:

- To understand how data is used or can be used currently by residents and businesses in Greater Lincolnshire in the Energy Sector.
- Get a sense of what the challenges are inherent to operationalizing data from the perspective of end users.
- To produce a set of recommendations that the Lincolnshire County Council and the Greater Lincolnshire Local Enterprise Partnership can act upon in making data-driven decision-making more accessible, and drive further innovation.

This report was drawn up following a similar piece of work conducted in early 2020. That first report on the Informational Needs around Energy in Lincolnshire consisted of an open data mapping exercise (see Appendix 1) and a write-up of an interactive workshop conducted before the first national lockdown in March 2020. This report identified, among other things, several gaps in the data around energy and individuals' knowledge and ability in using that data to make decisions:

- More understanding of the connections between the state of the economy and adoption of forward-looking energy initiatives.
- More understanding of the ways in which labour supply impacts the energy sector.
- More understanding of the overlap between energy and other industries.
- More understanding on the potential flashpoints that might prevent the early adoption of forward-looking energy and transport initiatives.

Additionally, the first study was able to garner information from practitioners, from both private and government organisations, about the challenges as they see it on the front line. These challenges included, but were not limited to issues of funding, issues of infrastructure, issues with labour supply, social issues and climate change.

Energy challenges

As of March 2020

0 1	FUNDING	As well as "money in the bank", this reflects the public perception of energy innovations, the ROI and SROI, and the general willingness to support energy initiatives.
0 2	INFRASTRUCTURE	Including, but not limited to: transport, waste management, housing, and the systems that facilitate making it more energy-efficient.
0 3	LABOR SUPPLY	Encompassing not just the number of workers in the sector, but also upskilling and support that is necessary to meet the challenges of automation and innovation.
0 4	SOCIAL ISSUES	Including but not limited to: regional disadvantages, social disadvantages, population specificities, health and wellbeing.
0 5	CLIMATE CHANGE	Specifically as it relates to food, green energy production and how that impacts agriculture, flood resilience, water shortage, peak waves and water management and storage.

Figure 2: Energy challenges as identified by the previous research on this topic

These challenges have continued throughout 2020 and into 2021 – indeed, one might argue that they have been exacerbated by the COVID-19 public health emergency. There were multiple themes that emerged from the latest public inquiry, but one of the main findings has been that challenges do not exist in isolation from one another; that initiatives aimed at one will likely have an impact on the others; that resources are spread thinly and that they should be deployed in a way that guarantees maximum impact across all areas; and that end users need to be involved in all stages of planning and deploying an intervention, not just at the evaluation stage.

One of the most common recurring themes of this research stage has been that energy data is not being used widely by citizens, be it in their private life or in business; or, if it is being used, that happens in ways that are invisible to decision-makers. The perception among those who make policy is that the average citizen does not engage with data on energy beyond their utility bill; that the average business does not think of energy as anything other than another overhead.

It is also worth noting here that despite the fact that the informational needs of individual citizens and businesses vary somewhat, the majority of businesses in Greater Lincolnshire are small and medium enterprises (SMEs), most of whom are categorized as micro enterprises (employing 10 people or less). This means that the majority of businesses that are likely to see the messaging around energy and data will likely not be able to outsource specialist skills and will filter the information through their collective knowledge and understanding of energy data. In other words, a organisation's engagement with data will depend on the collective skills and understanding of its members.

It is imperative for data to be accessible and commonplace for all to use, regardless of whether they are private citizens, public servants, or business owners. However, there are significant challenges before that is to happen – challenges related to how individuals and organisations use data, challenges to adopting a place-based perspective, challenges to deployment, and challenges to culture.

These will be discussed in more detail in the next section.

Barriers to better data culture

The first and biggest theme that emerged from this research inquiry was that the barriers to having a successful data culture on energy were high. These barriers could be seen in all aspects of the research – not just in terms of who signed up for and attended the public discussions, but also in reaching out to stakeholders and communicating to them the importance of participation.

While challenges to data usage and culture showed up in a multitude of ways during the research, they can be broadly classified in three groups:

- Barriers to access
- Barriers to engagement
- Barriers to development

That is not to say that there is insufficient data on energy – as seen by the first data mapping exercise (see Appendix 1) and the data sources named by participants in the March 2020 workshops (see Appendix 2) there is a wealth of information available on the subject. However, this information is often limited or inaccessible by how it is published, how it is presented, and how it is promoted to stakeholders.

Barriers to access to data

When we talk about barriers to access, we don't just mean the monetary cost of a dataset. Indeed, as it emerged from the group discussions, there was a lot of open data available on energy, and a lot of appetite for more data to be made open in the future. However, as it emerged from the discussion, barriers to access take many forms, including, but not limited to:

- Lack of signposting: for a company or an individual just starting to use energy data, there is no guidance as to where they should start from.
- Lack of verification: for a company or an individual just starting to use energy data, there is no clear way to tell whether a dataset is verified or not.
- Poor or inaccessible formatting: verified datasets are not always in an easily understandable format. For citizens and companies looking to use energy data for the first time, it can be hard to understand what the data says without additional context.
- Explanations being too technical: further to the above point, some datasets are accompanied by explanations that only make sense for those with background knowledge or education on energy data.
- High costs of quality datasets: open data on energy tends to be made available in a very raw format. More user-friendly data on energy exists behind a paywall, and for citizens and companies starting out, there is an added difficulty in determining what data is "worth the money" or not.
- Lack of specific data: finding relevant information, especially to new starters, is perceived as an impossible task.

The reasons for those barriers to exist are varied and complex. Energy companies, for example, are perceived by participants as not having a lot of choice as to what interests and agendas they must

follow. Energy agendas were perceived as being driven by regulated monopolies. The interests of energy companies are perceived as something they do not have control over, across all sectors.

Furthermore, we cannot overlook the importance of privacy and anonymisation. While energy data can be useful and valuable across multiple sectors, publishers do have a duty of care to individuals and a level of anonymisation must occur before the data is made open. Simplifying open data is crucial, but not to the point where a private citizen might have their personal information triangulated from a dataset. These are valid concerns that need to be addressed – but they do not have to be a conversation-ending point.

One thing which is overlooked when talking about opening energy data and privacy is how granular a dataset needs to be before it is useful to a majority of readers. Indeed, an argument brought up by the participants was that simple data releases, dashboards and bulletins would likely garner more interest and widespread usage than complex spreadsheets. The idea that one needs to have a PhD to understand data was considered to be one of the biggest barriers to entry, and one that also prevents curious citizens and businesses from engaging with discussions on energy.

Barriers to engagement

As seen from the previous section, the perception that one needs an advanced degree and contextual knowledge to use energy data is one of the biggest barriers to engagement that participants singled out in discussions. Indeed, the barriers to engagement may be more egregious than barriers to access/entry because they are far more widespread and more difficult to address.

Examples of barriers to engagement include, but are not limited to:

- Obsolete or otherwise irrelevant data being published: with a sector as dynamic as energy, keeping datasets updated and timely is crucial. Regularity and consistency were crucial for building trust in a data publisher.
- Lack of oversight of databases and how they are being used.
- Lack of education/resources for citizens at every level.
- Inefficient deployment of resources to support citizens and businesses to use energy data.
- Inappropriate education on energy data.
- Data not being fit for purpose.
- Lack of meaningful stakeholder engagement with citizens and businesses.
- Stereotyping and the perceived inaccessibility of data for the sector.

While the above barriers to engagement are described separately, they were discussed as interconnected. Particularly with regard to the stereotyping and perceptions surrounding energy data, participants identified a major gap between what information is available and what the public needs.

In discussions, this gap was explained in different ways. Education was brought up as a potential solution, however, participants agreed that it did not cover all bases.

In the parallel research LORIC conducted on the Health and Social Care sector, the digital divide merged as a real and significant barrier to innovation; participants in the discussions on Energy also reflected on it. Understanding and closing the digital divide appears to be a crucial aim for current and future interventions.

In the Health and Social Care report the digital divide was conceptualised as "a combination of logistical, monetary, educational, and emotional barriers around technology that prevent citizens from meaningfully participating in public life." This definition is equally applicable to the energy sector, if not more so, as the sector becomes modernized.

In addition to impacting individuals, the digital divide also effects companies. From the Health and Social Care Report, aspects of the digital divide include, but are not limited to:

- "Logistical barriers – obsolete or missing infrastructure, obsolete or missing hardware, insufficient energy supply to run a sustainable set of digital infrastructures.
- "Monetary barriers – direct and indirect costs of digital technologies, exacerbated by a lack of price transparency and citizens being in a poor negotiating position with providers.
- "Educational barriers – lack of comprehensive adult learning that supports digital skills.
- "Emotional barriers – for some communities living in digital poverty, there is a perception of devices like tablets and smartphones are a luxury rather than a necessity. "

Many of these barriers and challenges were identified as early as March 2020 during the first Data Discovery Workshop for Energy in Greater Lincolnshire. Participants in that workshop pointed to the lack of funding for innovative energy projects, the logistical barriers surrounding infrastructure, and the lack of qualified workers for the industry. Open data from the annual population survey[1] appears to support this – in 2019, the Water and Energy Sector in Lincolnshire had one of the smallest populations of workers: 8700 people employed, less than 2% of the entire sector in Great Britain.

Energy and Water	lep:Greater Lincolnshire	country:Great Britain
Managers, Directors and Senior Officials	1,100	64,600
Professional Occupations	1,500	106,000
Associate Prof & Tech Occupations	2,000	81,700
Administrative and Secretarial Occupations	~	50,000
Skilled Trades Occupations	1,100	61,900
Caring, Leisure and Other Service Occupations	!	3,500
Sales and Customer Service Occupations	!	34,300
Process, Plant and Machine Operatives	1,700	78,800
Elementary occupations	1,300	57,300
Total	8,700	538,100

There is no data on how training and support is distributed from sector to sector, but data for all of Greater Lincolnshire's labour force suggests that the bulk of job-related training and support in 2019 was given to those who were already holding a qualification of NVQ4 or above (annual population survey). While comparable data for 2020 is not yet available at the time of writing (the latest release being in Q3 2020) it is unlikely that these percentages have changed significantly.

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[1] https://www.nomisweb.co.uk/datasets/apsnew

What this means for the sector is that labour supply, access to specialised skills, and data-related skills in particular, is significantly limited. This further contributes to the sense that one needs unique skills to the sector in order to work with and understand data.

Participants in the public inquiry also gave examples of how the digital divide manifested in terms of infrastructural developments. Automation is a major ambition, not just for the energy sector but across industry – however, building a factory that was ran entirely by AI proved to be a major problem because of the poor bandwidth in the area. Providers were slow to respond and solutions offered were not cost-efficient. The infrastructure needed to cope with that demand is not there.

Finally, on the subject of the digital divide, it is worth returning to some of the emotional barriers that might be stopping businesses and individual citizens from engaging with innovative energy solutions. Despite the proliferation of digital-only services, smart phones and other internet-connected devices are still largely considered luxury items. This in turn poses challenges to digital innovation and digital learning, because is adds to the idea of digital literacy as being something for specialists.

Barriers to development

While discussed separately from barriers to access and barriers to engagement, barriers to development are seen as a by-product of the first two categories. Participants in this research noted that a lot of the larger data publishers like energy companies and the government were not really incentivised to change their methods of publication by the end users. Furthermore, the benefits of better data on energy are rarely communicated to end users in a way that would incentivise them to overcome barriers of access or engagement.

And as seen from previous sections, end user involvement is crucial. This includes, but is not limited to:

- Publishers inviting end users (both businesses and private citizens) to be involved in how a service is designed.
- Publishers inviting end users to be involved in how a service is deployed.
- Publishers inviting end users to evaluate and rate how a service is delivering.
- Explaining to end users how this data can be immediately beneficial to them.
- Answering end users' questions and concerns about privacy and data security in a way that makes sense for them.

The end aim of such involvement would be to produce data products and services that are fit for purpose and resource-efficient. Moreover, during the discussions, it was stressed that data users needed to feel like they made meaningful contributions, and that they were being listened to, in order to feel like they have a stake in how the intervention does. Participants in the discussions agreed that having the end users' buy-in would significantly increase a product or services' chances of long-term success.

It is also worth noting that, according to participants, a lot of important data on heat, energy, water, gas and hydrogen only exists "below the meter." In other words, involving both private citizens and companies in this endeavour is important in order to understand better what is not being captured on existing datasets.

Overall, many participants in the discussions felt there were real benefits that end users could reap from a fully mature data culture around energy, but those benefits were being communicated poorly.

On the business side of things, an additional barrier to development was the economic feasibility of data publishing. As stated in previous sections, many open datasets are currently published in their raw format, in other words:

- Without the data being cleaned.
- Without the data being organised.
- Without accompanying context or explanation.
- Without any accessibility features enabled. (i.e. using formats that only some electronic devices can run).
- Without proper signposting (to enable discovery).
- Without any semblance of headline findings to support access from stakeholders who do not want to drill down to individual line level.

Largely speaking, participants in the public inquiry did not feel that data is not currently being published and optimised for the benefit of the everyday user, which in turn stifles innovation. A new entrant to the field of energy data, be it a user or a publisher, would struggle to know where to start, what is already available, and what is needed. Effectively, all data publishers and users would be starting from the same place, rather than building on what is already there.

Furthermore, there is a lack of choice and opportunity for all businesses to access data without any strings attached. Certain datasets are optimised for certain industries, but there is no uniformity and no support for those that might be new to using energy data for their business. Participants stressed the importance of offering choice and opportunity for everyone, as levelling the playing field would enable the county to punch above its weight in terms of the products on offer.

The ways in which data is produced and collated for projects is economically unfeasible, which in turn stifles innovation. Furthermore, processes for collecting data tend to vary a lot from organisation to organisation, leading to a lot of skewing in the supply of data for businesses, individuals and governance.

Finally, participants discussed the ways in which data on energy, heat, and water is currently being separated out. The overarching consensus among participants was that there was no reason why that data ought to be separated, and indeed, that the data would be most useful if it were examined together. Understanding the overlap between energy, heat, and water was seen as a crucial aspect of getting the data necessary to make decisions to any stakeholder.

Examples of how that could happen included, but were not limited to:

- Looking at surplus heat and water and what the data says about heat efficiency in any given neighbourhood.
- Looking at how the grid copes as heat is electrified.
- Mapping heat and sync with electricity demand and usage with the resources already available.
- Utilising developing connections between BOGAS, Hydrogas transportation.

Of course, the idea of co-ordination of energy needs careful thought, and participants agreed that local councils would have to work together in order to enable that to happen. However, there are ways in which this co-ordination could work, and indeed, participants recognized that climate adaption demands a more co-ordinated approach, as silo working was viewed as not simply inefficient but unsustainable.

Opportunities for Energy Moving Forward

Participants recognized that there were multiple opportunities for data in energy moving forward. For example, while 2020 is largely seen as an outlier year, participants noted that there are opportunities in integrating forward-thinking energy initiatives across all industries as part of companies' COVID-19 exit strategies.

What those initiatives might look like would vary from company to company, but it could include, among other things:

- Integrating more user-led approaches to facilitate data gathering.
- Encouraging a working-from home model or a flexible work model that enables efficient energy usage in appropriate industries.
- Changing transport models and improving transport links.
- Supporting individual companies with using data for energy efficiency.
- Business Growth Hubs and District Councils will be gathering data now. Pre-Covid 19 GDPR decimated data but the Covid response has engaged more businesses regarding growth.
- Working with the improving public sentiments towards data and data sharing to develop ideas and solutions.
- Energy options being taken more seriously, as well as net zero. There will be interest towards information that would help people make their decisions.
- Companies who are currently looking to devise their COVID-19 exit strategy are now making decisions that will impact energy usage and energy planning.
- Working on sustainable development goals.

There are also a lot of opportunities for data mining and data usage:

- There are huge data dumps emerging from reports, for example from Sustainable West Midlands and K Matrix.
- WPD are engaging and have upped their game regarding the willingness to share data, equally the Northern Powergrid are also engaging well. UK Power Networks won the award recently as the most proactive organisation.
- OFGEMs challenge is for local authorities to become masters of data and energy. ELEP, LAAP – data driven.
- Medidata Analysis is the next big step – being able to bring data sets together to enable studies and analyse overarching trends.
- Data from DNOs and OFGEM is an excellent candidate to be made open.
- Energy data task force, EV task force, Digital Twin at least 20 initiatives looking at data and digitalisation.

The key is place based perspectives, it is important to look at analysis from other areas and leverage it. This point was furthered by the case studies put forward by the participants:

- BCR – Sutterton Roundabout has been a successful project although it has been largely considered a one-off. It might be worth considering which lessons learned from that project might be taken forward
- Community and Community Energy Fund – in particular looking at the next two years and beyond the energy hub is trying to extend and to get rid of the urban markers. Funding more community energy projects, more community (ERC) energy companies in Lincolnshire, is largely seen as an opportunity for data and collaboration around data. Any previous successful projects have been asked to sign a disclosure for any learnings from their involvement to be shared with other energy groups.
- Open data source coding, ie Libre Office, can provide a similar product to Microsoft options around energy. This brings down costs and removes one of the barriers to opening data.

From discussions it is clear there are multiple benefits for stakeholders to engage with energy data for the better. The next big step is therefore changing the public's perception towards energy data. At present, many stakeholders believe strongly that data is something that can only be used by people with advanced degrees, and that it is therefore only beneficial to people with those degrees. What this inquiry has shown is that actually there are a lot more opportunities for stakeholders, and that there should be some time spent mapping stakeholders and finding ways of engaging them. The below graphic is just a sample of how that could look like.
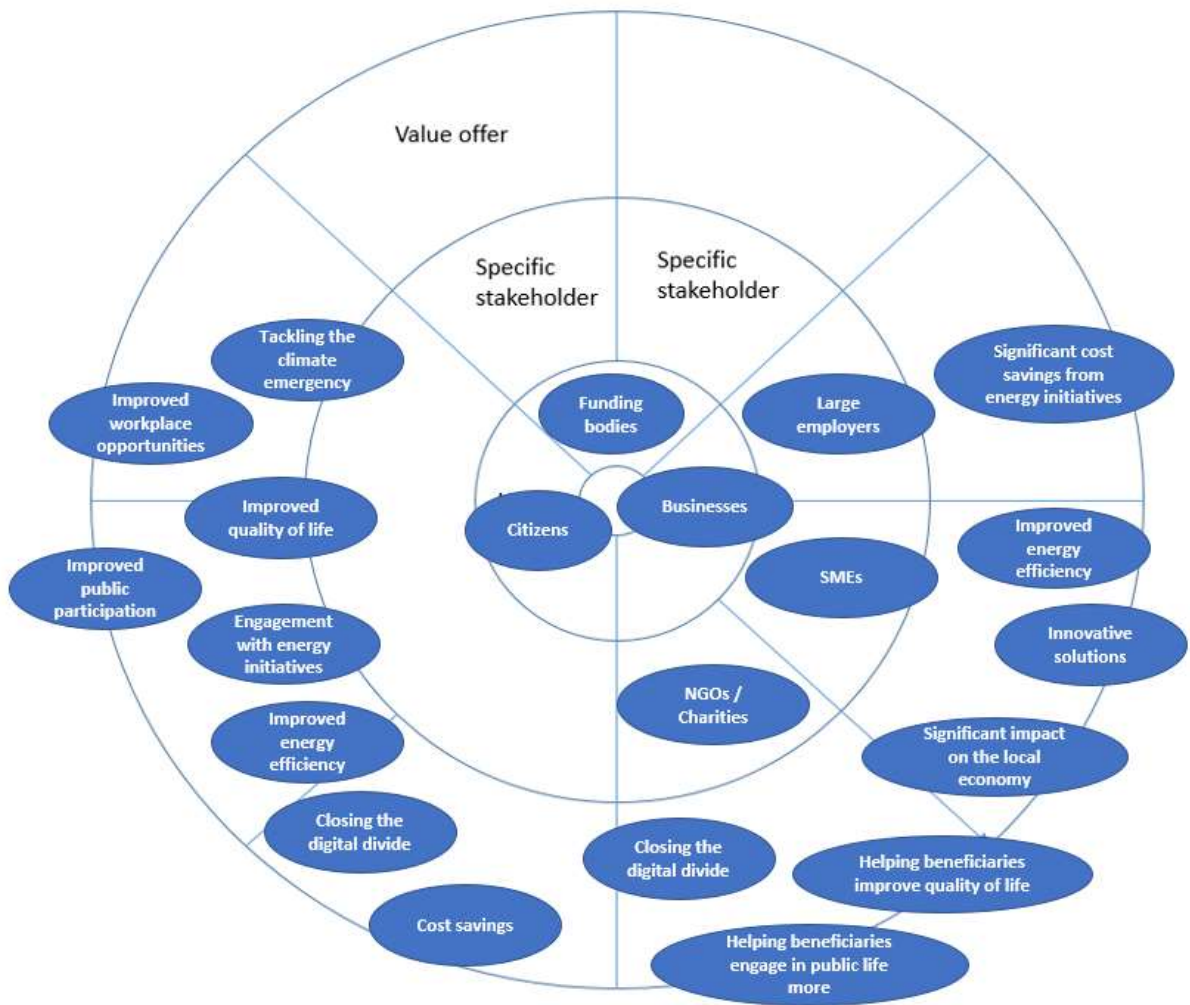
Figure 3: Sample stakeholder map for the benefits of energy data usage

What stakeholder engagement might look like varies from initiative to initiative. For example, one way of doing so would be to understand public conerns and translating them into energy initiatives by targeting clear concerns, simplifying messages, making the overall benefits to the community clearer, and engaging community champions to help citizens have their voices heard early on in a consultation, so that course correction can happen in a timely, cost-efficient manner:

UNDERSTANDING PUBLIC CONCERNS

And translating them into energy initiatives

CLIMATE EMERGENCY	ENERGY SIMPLIFIED	EMPHASIZING OVERLAP	COMMUNITY ENGAGEMENT
Stakeholders seek clear, straightforward recommendations, actionable points, and levels of information that they can act on based around their means and resources.	The public perception of energy data is that it is "above their paygrade" - changes need to be made to how data is published. This includes more transparency around decision-making.	The energy sector is interconnected with other industries. Making this overlap clear is likely to increased public engagement with energy initiatives as well.	Employing community energy champions to ensure that stakeholders are involved in new initiatives from the beginning and that their input is heard from the beginning.

Figure 4: Using stakeholder management to transform public concerns into engagement with energy initiatives

The above figure illustrates what is currently both public concern and a means of addressing it: as seen from this inquiry, many citizens simply do not engage with energy initiatives because the recommendations are not clear enough, they feel they don't understand the opportunities presented to them, they don't see the connection to other areas that impact their lives in more obvious ways (like for example, the connection between health and social care and energy).

Furthermore, community engagement is something that was emphasised as having great value in helping the most marginalized communities have their voices heard, but it is something that is underutilized at present. Some of the most cost-effective ways of stakeholder engagement can be found in the training and employment of community champions.
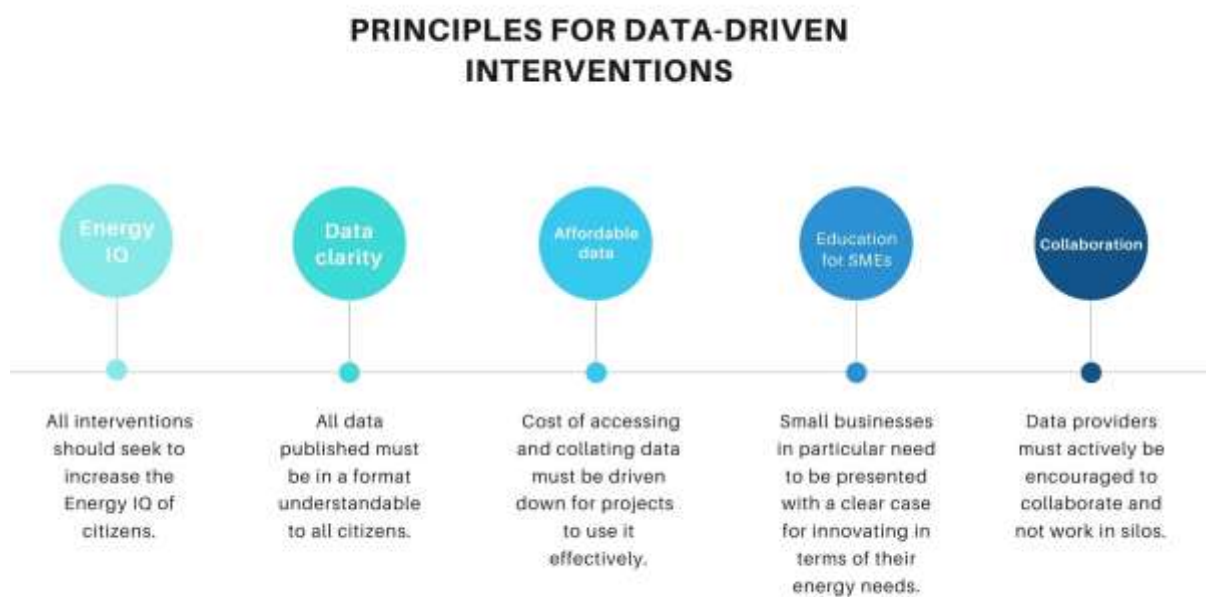
Recommendations

Based on the discussions and the above points, the following recommendations have been put forward:

- Actively work to engage stakeholders: despite the rapidly multiplying headlines around data, sustainability, and the climate emergency, it is clear that energy is still viewed by the wider public and the majority of the business community as a specialist field.
- Actively work to change perceptions: energy is too important to be perceived as something that one can only understand if one has a PhD. This is particularly true with regard to closing the digital divide in Greater Lincolnsire.
- Work with organisations for them to understand and change their data culture where needed: data needs to be collected prior to engaging in any project, and opened in such a way that it makes the most sense to all stakeholder groups.
- Actively work to challenge the perception of viewing sustainable energy (and the technologies surrounding it) as a luxury rather than essential.

- Addressing the digital divide by providing sufficient education, knowledge, information it makes sense that people are aware when building/buying houses that they have good energy IQ.
- Trusted information, trusted data from trusted advisors – decisions makers are advised to start the pathway and mechanism for individuals and businesses to move forward in the recovery stage of Covid 19.

Furthermore, this research and the accompanying inquiry into the health and social care data needs in Greater Lincolnshire have revealed a number of principles for data-driven interventions that could be very beneficial if applied by new energy projects:

PRINCIPLES FOR DATA-DRIVEN INTERVENTIONS

Energy IQ	Data clarity	Affordable data	Education for SMEs	Collaboration
All interventions should seek to increase the Energy IQ of citizens.	All data published must be in a format understandable to all citizens.	Cost of accessing and collating data must be driven down for projects to use it effectively.	Small businesses in particular need to be presented with a clear case for innovating in terms of their energy needs.	Data providers must actively be encouraged to collaborate and not work in silos.

These principles are based around the barriers identified around engagement with energy data in this report. New data-driven interventions are advised to:

- Close the digital divide: the Energy IQ of citizens is closely connected to the digital divide, and how prominent it is in any given community. Identifying and closing the digital divide is therefore advised for all interventions, as it is the first step towards increasing awareness and understanding of what exactly energy data means and how does it apply to individuals and the businesses.
- Changing the data culture: a lot of organisations that publish data do so in formats that are not accessible to the wider business community and the public. As such, a concentrated effort towards changing data culture is advised.
- Open data should be made the norm: by using open source software and making use of existing open data repositories, new and existing projects can help change the data culture.
- Small business involvement: SMEs represent the majority of businesses in Lincolnshire. Their energy needs, and their capacity of becoming involved with energy initiatives, will be a determining factor in Greater Lincolnshire reaching its decarbonaization and sustainability goals.
- Collaboration, especially around data aggregation needs to be encouraged: actively stopping organisations from working in silos will speed up the adoption of data-driven solutions

around the country. However, this requires changes not just on an individual, but also on a cultural level.

Finally, it is imperative that stakeholder needs and concerns are taken into account. Effective stakeholder management is unfortunately still underutilized in the energy field. However, it is potentially one of the most cost-saving opportunities availale to providers seeking to increase public engagement and secure the buy-in of companies for new energy initiatives.

Appendix 1: Previous Data Discovery

Mapping out the existing open datasets for energy

Nation-wide open data on energy

Data.gov.uk

The Government's Open Data Portal identifies 235 separate datasets on "energy" that have been published under and Open Government License (401 under all licenses). Of those that were tagged by topic (approximately 169), the majority were about the Environment, followed by datasets on Towns and Cities, and Business and Economy. A small proportion of those datasets were more about government spending and transparency and described the spending of departments such as the Ministry of Justice or the Department for Education:

Topic	Number of Datasets
Business and Economy	29
Crime and Justice	1
Environment	49
Government	17
Government Spending	11
Health	3
Mapping	3
Society	15
Towns and Cities	34
Transport	3

The top publishing authorities according to the aggregator website are:

Publisher	Number of datasets
Department for Business Energy and Industrial Strategy	53
Greater London Authority	21
Department for Energy and Climate Change	19
Joint Nature Conservation Committee	15
MHCLG	14

Local authorities were represented on the aggregator website, although their contributions varied from information pertaining to public spending to information on fuel poverty and CO2 emissions. A lot depended on the choices of the local authority and how frequently they updated their information on the government aggregator website as well as on their own open data portals:

Publisher	Number of datasets
Leeds City Council	4
Plymouth City Council	3
Bristol City Council	2
City of York Council	2
Lincolnshire County Council	2

What this means is that, generally speaking, there are quite a number of relevant datasets published nationally; however certain local authorities are more responsive to calls for open data than others. At present, this is not a significant enough question to debate – in the future, when more and more collaboration and information-sharing will be needed to tackle questions of energy efficiency and climate change, this could be vital. Arguably, the councils that publish the most open data will be at the forefront of that discussion.

Datasets of note:

UK Energy in Brief – Department for Business, Energy and Industrial Strategy ([latest release](#), 2018 data)

Domestic Chargepoint Analysis 2017 – Department for Transport ([raw data](#)) "Experimental statistics on the usage of OLEV-funded domestic chargepoints in the UK in 2017. This includes details of charging events and amount of energy supplied."

Tracking fuel poverty – Department for Work and Pensions ([2010](#)) "Fuel poverty is the requirement to spend 10% or more of household income to maintain an adequate level or warmth. The energy efficiency of a house can be measured using the Standard Assessment Procedure (SAP). The procedure calculates a number between 1 and 100, low numbers generally indicate that a house that has low levels of insulation and an inefficient heating system where as numbers closer to 100 indicate a very energy efficient house. SAP is the Government's recommended system for energy rating of dwellings. SAP is being used as a proxy for fuel poverty in households of people claiming income-based benefits, given the link between income poverty and fuel poverty. Source: Department for Work and Pensions (DWP) Publisher: DCLG Floor Targets Interactive Geographies: County/Unitary Authority, Government Office Region (GOR), Geographic coverage: England, Time coverage: 2008/09"

Fuel Poverty – Lincolnshire County Council ([2017](#)) "Households in Fuel Poverty using the government Fuel Poverty Low Income High Costs (LIHC) method. The data shows numbers and percentages of households at County, District, and Lower Super Output Area (LSOA) geographies. The dataset is updated annually. Source: Experimental statistics published by the Department for Business, Energy and Industrial Strategy (DBEIS). See the source weblink for further guidance on the statistics and their uses and limitations. (For example, these Estimates of fuel poverty should only be used to look at general trends and identify areas of particularly high or low fuel poverty. They should not be used to identify trends over time)."

Energy Savings Opportunity Scheme – DEFRA ([2020](#)) "The Energy Savings Opportunity Scheme (ESOS) applies to large undertakings operating in the UK. The rules relating to the scheme are set out in the Energy Savings Opportunity Scheme Regulations 2014 (Regulations). The Regulations require large undertakings to notify the ESOS administrator that they have complied with the scheme requirements. Full details about the scheme including the full list of questions to which this data relates are provided in the ESOS guidance document which can be found on the ESOS page of GOV.UK. These are subsets of information submitted by the scheme applicants who submitted their

notifications of Phase 1 compliance by 31 May 2018 and Phase 2 notifications as at the 10 January 2020. We publish this data to meet our statutory responsibility under the Energy Savings Opportunity Scheme Regulations 2014 and also in accordance with government open data policies. The datasets do not include data which we have determined to be personal data, this is protected under the General Data Protection Regulations. The data contained in the spreadsheet has not been verified to confirm the compliance of these organisations with the ESOS Regulations 2014, it is purely a record of those organisations that have notified us that they are compliant for each relevant phase of the scheme. Where there are elements of the information provided that appear non-compliant these will be picked up and addressed in compliance auditing which we undertake during each four year phase. The data is published as provided. Attribution statement: © Environment Agency copyright and/or database right 2016. All rights reserved."

Climate Change Civil Penalties – Environment Agency ([2020](#)) "Civil Penalties issued under a climate change regime: European Union Emissions Trading Scheme (EU ETS), CRC Energy Efficiency Scheme (CRC), Energy Savings Opportunity Scheme (ESOS), Fluorinated Greenhouse Gas regime (F-Gas) and Climate Change Agreements (CCA) Attribution statement: © Environment Agency copyright and/or database right 2017. All rights reserved."

CO2 Emissions – Lincolnshire County Council ([2019](#)) ''This data shows total CO2 emission estimates in tonnes of CO2 per Person per Year. This government data aims to provide nationally consistent carbon dioxide emission estimates at local authority and regional level (methodology may be subject to refinement hence estimates may be recalculated for previous years). On their own, however, these estimates cannot give all the information necessary to plan and monitor the progress of all local emissions reduction initiatives, this may require additional local monitoring. Supporting methodology information and further data, for example, CO2 sub-totals shown by sector, are available from the source weblink. Source: Department for Business, Energy and Industrial Strategy (DBEIS), UK local authority and regional carbon dioxide emissions national statistics. This dataset is updated annually, usually June."

Hospital Estates and Facilities Statistics – Department for Health and Social Care ([2013](#)) "The data provides a central source of information on the estates and facilities services in the NHS. It covers such aspects as the size of the estate, quality of its buildings, energy efficiency and sustainability data, hospital cleaning and hospital food. Source agency: Health Designation: Official Statistics; not designated as National Statistics; Language: English Alternative title: Hospital Estates and Facilities Statistics".

Energy Crops Scheme Agreements – Natural England ([2019](#)) "Energy Crops Scheme Agreements – based on Probis extract. Attribution statement: Attribution statement: © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right [year]."

Energy Performance of Buildings – MHCLG ([release pending](#))

Domestic Energy Factfile – Cambridgeshire Insight ([release pending](#))

Historic Flood Warnings – Environment Agency ([2020](#)) This record is for Approval for Access product AfA435. Listing of Severe Flood Warnings, Flood Warnings and Flood Alerts issued since the flood

warning system went live on January 26th 2006 to the present. This dataset includes flood warnings issued by the Environment Agency. Flood warnings are issued for flooding from rivers and the sea and, for a limited number of locations, for groundwater flooding. There are three flood warning codes and a notification when warnings are removed. These are: - Severe Flood Warning: Severe flooding. Danger to life. - Flood Warning: Flooding is expected. Immediate action required. - Flood Alert: Flooding is possible. Be prepared. - Warning no longer in force: Flood warnings and flood alerts that have been removed in the last 24 hours. Live flood warnings in force are shown on GOV.UK and are available as a separate live feed on GOV.UK. Attribution statement: © Environment Agency copyright and/or database right 2015. All rights reserved.

Flood Warning Areas – Environment Agency ([2019](#)) This record is for Approval for Access product AfA054 Flood Warning Areas are geographical areas where we expect flooding to occur and where we provide a Flood Warning Service. They generally contain properties that are expected to flood from rivers or the sea and in some areas, from groundwater. Specifically, Flood Warning Areas define locations within the Flood Warning Service Limit that represent a discrete community at risk of flooding. A discrete community is a recognised and named geographical community, which can be an urban area, a significant suburb of a large city or a village or a hamlet. The purpose of Flood Warnings are to alert people that flooding is expected and they should take action to protect themselves and their property. Flood Warnings are issued when flooding is expected to occur, Severe Flood Warnings are issued to similar areas when there is a danger to life or widespread disruption is expected. INFORMATION WARNING: Groundwater flood warning areas are properties based, usually containing a discrete urban area, suburb, city, village or hamlet and were created in various ways. In general, technical specialists used the national groundwater dataset, historical maps, bedrock geology and records of properties affected by groundwater flooding in the past to create the groundwater flood warning areas. Additional data sources, including groundwater susceptibility maps, borehole data, local modelling and LiDAR may also have been used depending on the location of the area. The triggers for Flood Warnings for groundwater flooding are based on actual observed groundwater levels. There are currently no flood risk maps for groundwater so our flood warning areas for groundwater tend to cover properties which we know have been flooded by groundwater in the past. Attribution statement: © Environment Agency copyright and/or database right 2019. All rights reserved.

Flood Map for Planning – Environment Agency ([2020](#)) The Flood Map for Planning (Rivers and Sea) includes several layers of information. This dataset covers Flood Zone 2 and should not be used without Flood Zone 3. It is our best estimate of the areas of land at risk of flooding, when the presence of flood defences are ignored and cover land between Zone 3 and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year. This dataset also includes those areas defined in Flood Zone 3. This dataset is designed to support flood risk assessments in line with Planning Practice Guidance; and raise awareness of the likelihood of flooding to encourage people living and working in areas prone to flooding to find out more and take appropriate action. The information provided is largely based on modelled data and is therefore indicative rather than specific. Locations may also be at risk from other sources of flooding, such as high groundwater levels, overland run off from heavy rain, or failure of infrastructure such as sewers and storm drains. The information indicates the flood risk to areas of land and is not sufficiently detailed to show whether an individual property is at risk of flooding, therefore properties may not

always face the same chance of flooding as the areas that surround them. This is because we do not hold details about properties and their floor levels. Information on flood depth, speed or volume of flow is not included. Attribution statement: © Environment Agency copyright and/or database right 2018. All rights reserved. Some features of this map are based on digital spatial data from the Centre for Ecology & Hydrology, © NERC (CEH). © Crown copyright and database rights 2018 Ordnance Survey 100024198

Office for National Statistics

The office for National Statistics (ONS) has 79 statistical bulletins, 9 articles, 213 time series, 30 datasets and 61 pieces of user requested data relating to energy. Most of them pertain to low-carbon and energy usage, as well as the current energy needs of the manufacturing and service sectors.

Datasets of note:

Energy Use: ([2019](#)) "Data showing the relationship between the UK Environmental Accounts and the Digest of UK Energy Statistics (DUKES), 1990 to 2017."

Manufacturing and production industry: ([2019](#)) "UK manufacturing and other production industries (such as mining and quarrying, energy supply, water supply and waste management), including total UK production output, and UK manufactures' sales by product and industrial division, with EU comparisons."

Index of production ([2019](#)) "Movements in the volume of production for the UK production industries: manufacturing, mining and quarrying, energy supply, and water and waste management. Figures are seasonally adjusted."

Low carbon and renewable energy economy, UK: ([2018](#)) "Estimates of the size of the UK's green economy from the Low Carbon and Renewable Energy Economy Survey, including turnover, employment, investment and trade."

Energy, goods and services used by UK businesses Statistical bulletins ([2016-2018](#)) "Detailed product by industry proportion estimates using the results from the Annual Purchases Survey 2018."

Index of Production time series ([2020](#)) "Movements in the volume of production for the UK production industries: manufacturing, mining and quarrying, energy supply, and water and waste management. Figures are seasonally adjusted."

Atmospheric emissions: greenhouse gases by industry and gas ([2019](#)) "Data on the emissions of carbon dioxide, methane, nitrous oxide, hydro-fluorocarbons, perfluorocarbons, sulphur hexafluoride, nitrogen trifluoride and total greenhouse gas emissions, UK, 1990 to 2017 and provisional 2018."

Atmospheric emissions: acid rain precursors by industry and gas ([2019](#)) "Data on the emissions of sulphur dioxide, nitrogen oxide, ammonia, and total acid rain precursors, by industry (SIC 2007 group - around 130 categories), UK, 1990 to 2017 and provisional 2018."

Atmospheric emissions: other pollutants by industry and gas ([2019](#)) "Data on the emissions of PM10, PM2.5, carbon monoxide, non-methane volatile organic compound, Benzene and 1,3-

Butadiene, by industry (SIC 2007 group - around 130 categories), UK, 1990 to 2017 and provisional 2018."

Oil and Gas: reserves and resources ([2019](#)) "Estimates of the UK's remaining recoverable oil and gas reserves and resources."

Low carbon and renewable energy economy estimates ([2020](#)) "Annual estimates of low carbon and renewable energy economy activity in the UK and constituent countries: turnover, employment, exports, imports, acquisitions, disposals and number of businesses."

UK Environmental Accounts Statistical bulletins ([2010-2019](#)) "Measuring the contribution of the environment to the economy, the impact of economic activity on the environment, and society's response to environmental issues. Satellite accounts to the main UK National Accounts."

Department for Business, Energy and Industrial Strategy
The Department for Business, Energy and Industrial Strategy is part of the UK government. It has 798 different kinds of research and statistics published on its website, with additional ones upcoming. 496 of those pertain to the environment, while a further 32 pertain to Housing, Local, and Community.

Datasets of note:

Renewable Heat Incentive deployment data ([2020)](#) "Statistics for the Renewable Heat Incentive (RHI) programme detailing the number of applications and accredited installations on the non-domestic and domestic schemes so far."

Weekly Road Fuel Prices ([2013-2020](#)) "BEIS publishes road fuel price statistics providing average UK retail 'pump' prices on a weekly basis." Energy Trends UK Renewables (2013-2020) Data on the UK's renewables sector, including capacity, electricity generation and liquid biofuels consumption.

BEIS Public Attitudes Tracker: Wave 32 ([2020](#)) Findings from the 32nd quarterly wave of the BEIS Public Attitudes Tracker (PAT)

Household Energy Efficiency Statistics, headline release ([2020](#)) Household Energy Efficiency Statistics, headline release (January 2020)

Final UK greenhouse gas emissions national statistics ([1990 to 2018](#))

Annual January prices of road fuels and petroleum products ([2013-2020](#))

International road fuel prices ([2013-2020](#)) BEIS publishes comparisons of road fuel prices against other EU countries, using data from the European Commission Oil Bulletin

Domestic energy price indices ([2013-2020](#))

Energy Trends: UK total energy ([2013-2020](#))

Energy Trends: UK solid fuels and derived gases ([2013-2020](#))

Energy Trends: UK oil and oil products ([2013-2020](#))

Energy Trends: UK gas ([2013-2020](#))

Energy Trends: UK electricity ([2013-2020](#))

Energy Trends: UK weather ([2014-2020](#))

Sub-regional Feed-in Tariffs statistics ([2013-2020](#)) Number of installations and total installed capacity by technology type at the end the latest quarter.

Solar photovoltaics deployment ([2014-2020](#)) Monthly deployment of all solar photovoltaic capacity in the United Kingdom.

Energy Trends and Prices statistical release ([30th January 2020](#)) The latest provisional monthly energy production, consumption and prices statistics produced by the Department for Business, Energy and Industrial Strategy.

Joint Nature Conservation Committee
[All work](#)

MHCLG

The Ministry for Housing, Communities and Local Government has 10 datasets published on environment and a further 451 on housing, local and community. Relevant datasets of note are pertaining the [house building and energy efficiency of new builds](#).

NOMIS

From the website:

> "Nomis is a service provided by the Office for National Statistics, ONS, to give you free access to the most detailed and up-to-date UK labour market statistics from official sources."

> It contains data from the following sources:

- [Annual Civil Service Employment Survey](#)
- [Annual Population Survey/Labour Force Survey](#)
- [Annual Survey of Hours and Earnings](#)
- [Business Register and Employment Survey](#)
- [Census](#)
- [Claimant Count](#)
- [DWP Benefits](#)
- [Jobs Density](#)
- [Jobseekers Allowance](#)
- [Life Events](#)
- [Population Estimates/Projections](#)
- [Regional Accounts](#)
- [UK Business Counts](#)
- [Workforce Jobs](#)

Nomis data does not pertain directly to energy; however, some of that data can be used to add depth to research on a more local level, and help build an understanding about the population and their needs. For example, the [Local Enterprise Partnership Profile for Greater Lincolnshire](#) provides a

quick overview not just of the resident population, but also economic activity, average earnings, qualifications, job density, and businesses. With data from other agencies, data on companies and labour can give additional information about the status of Greater Lincolnshire per county and per ward, what the estimated energy needs and impacts are, and what that means for the UK's overall targets with regards to climate change.

The European Commission's Department for Business, Energy and Industrial Strategy has insights about the internal market, industry, entrepreneurship and SMEs. For the United Kingdom, it holds information on the following regions:

- EAST MIDLANDS
- EAST OF ENGLAND
- LONDON
- NORTH EAST
- NORTH WEST
- SOUTH EAST
- SOUTH WEST
- WEST MIDLANDS
- YORKSHIRE AND THE HUMBER

Datasets of note:

Key Enabling Technologies (KETs) Database for SMEs "The KETs Observatory aims to provide EU and national policy makers, and business stakeholders with quantitative and qualitative information on the industrial deployment of Key Enabling Technologies both within the EU and in comparison to other world regions (East Asia and North America)."

Regional Innovation Monitor Plus "In the context of the growth and investment package set out in the Investment Plan of the European Commission, the Regional Innovation Monitor Plus (RIM Plus) provides a unique platform for sharing knowledge and know-how on major innovation and industrial policy trends in the EU regions."

The Regional Innovation Report for the East Midlands (2014) "The East Midlands is traditionally recognised for its strengths in manufacturing, with transport equipment and food & drink significantly more productive in the region than nationally. With a decline in traditional industry and relative growth in the service sectors, the East Midlands shares many similar challenges to other English regions, and presents a mixed picture across a number of economic indicators. The region performs relatively well against long-term unemployment, but displaying lower GDP per capita and lower labour productivity than some comparators. Employment in agriculture remains high compared to the national average, though specialisation and employment in 2 or 3 star clusters remain muted or low. The labour market picture remains mixed, with higher education and life-long learning indicators, and labour market efficiency lagging slightly behind the UK but ahead of the EU27 average."

Lincolnshire-specific open datasets on energy

Lincolnshire Research Observatory

The Lincolnshire Research Observatory is a data hosting platform that contains information on topics such as Access to Services, the Environment, and Health. The Lincolnshire Research Observatory contains both raw data and written reports that can be accessed and used by anybody. However, the various topics on the website have not been recently updated and it appears that data contribution has gone down in the past two years. It is possible that the website will receive and influx of new data with the publication of the 2021 Census, but in the meantime, it is more a historic resource for energy needs in Lincolnshire than a current one.

- **Access to Services** (last updated 2017)
- **Housing** (last updated 2018)
- **Environment** (last updated 2018)
- **Health** (last updated 2018)
- **Lincolnshire Economic Briefing** (last updated 2019)

Lincolnshire Open Data (run by the Lincolnshire County Council)

Lincolnshire Open Data is a CKAN website that is run by the Lincolnshire County Council. It has comparatively recent data that pertains to energy and the environment, including CO2 Emissions per capita and Household Waste and Recycling. The site is slowly being populated and appears both current and topical. However, in terms of variety and quantity, it will take some time before it is fully operational.

- **Average Rainfall Temperature** (2020)
- **Household Waste and Recycling** (2019)
- **CO2 Emissions** (2019)
- **Land and Building Assets** (2019)
- **Fuel Poverty** (2019)

Relevance to the GLLEP and Lincolnshire County Council's strategies:

What the available open data sets highlight, on first examination, is the overlap between the energy industry and other sectors. It is not possible, for example, to discuss electric vehicle rollout without talking about electric charge point usage at private residences and whether new builds meet all the requirements for such usage over the long term. It is also not possible to talk about energy needs in Lincolnshire without touching on fuel poverty and how that connects to people's health and social care, particularly as the population ages.

While the datasets mapped out in this report are diverse, both in terms of what they represent and how often they are updated, they can offer several avenues for research as pertaining to the strategies of the GLLEP and Lincolnshire County Council.

1. **Secure, low cost, low carbon energy across Greater Lincolnshire through:**
   a. **Energy Resilience:** MHCLG data pertaining to the energy efficiency of buildings can be a valuable resource, not only in understanding the energy efficiency of existing

dwellings builds, but also in making some assumptions about the energy efficiency of new buildings. Datasets about the energy efficiency of old buildings and public buildings can also give indications about what realistic energy resilience targets might be, and the data could help developers extrapolate how much it would cost to make an old build energy efficient again.

b. **Affordable energy and waste**: The datasets collected on data.gov.uk and Lincolnshire Open Data on fuel poverty are crucial in understanding not only the challenges to sustainable energy, but also the things large swathes of the population might consider to be insurmountable barriers to adopting a more sustainable low carbon energy model. Fuel poverty is likely to become a flashpoint issue as the population ages. Furthermore, fuel poverty represents a significant overlap between the interests of the energy and those of the health and care sectors in Greater Lincolnshire.

c. **Sustainable energy:** BEIS data on UK energy supplies (particularly wind and water) could be used in conjunction with any local geographic and meteorological data to extrapolate what sustainable energy projections might look like for Lincolnshire. This data can then be used to attract investment in appropriate developments of infrastructure and builds to help generate sustainable energy.

2. **Commercial and residential development in capacity constrained areas through:**
    a. **Achievement of aims for housing, infrastructure and growth in business**: Datasets such as the Domestic Charge point analysis can help with the predictions and planning for customer behaviours as electric vehicles are being rolled out. While the data is still experimental, it could potentially become an invaluable resource in terms of estimating the strain placed on the energy grid as more and more electric vehicles become introduced. Furthermore, it can help new housing developments in terms of building the infrastructure needed to sustain those vehicles.

    b. **Planning best-practice that encourages and incentivises sustainability of development:** Data from BEIS and BEIS (EU) regarding the Regional Innovation Motivators and Key Enabling Technologies can serve to predict behaviours of businesses and entrepreneurs around signing up for new initiatives and coming up with their own sustainable best practices. The MHCLG has also published a number of datasets pertaining to the energy efficiency of buildings that are relevant to the topic.

    c. **A system where DNOs are able to invest upfront in infrastructure to support accelerated development:** A number of the datasets pertaining to the energy opportunities discussed in point 1 might be helpful for Distribution Network Operations (DNOs) in investing upfront in infrastructure to support accelerated development. This data can further be supplemented with local economy data which could potentially reassure funders that their investment would yield returns over a sustained period of time.

3. **A sustainable transport system through:**
    a. **Electric Vehicle readiness with enough charging points to make driving electric vehicles a viable option:** Datasets such as the energy savings opportunity scheme or the domestic charge point analysis can be used to predict and plan for customer behaviours as new energy savings schemes are being rolled out.
    b. **A close partnership with Midlands Connect and neighbouring LEP areas to upgrade transport infrastructure:** As of right now, not many local authorities are making pertinent data open, or at least they are not publicising it in a way that makes it easier to find. Encouraging more data sharing and open data publication between Midlands Connect and neighbouring LEP areas might be a goal worth pursuing as this would likely become crucial in informing any joined-up efforts on energy.
    c. **Early adoption of new transport technologies:** Data regarding the energy efficiency of public buildings might be useful in the discussion on the early adoption of new transport technologies. Likewise, county-wide data on the state of infrastructure, and the availability of energy sources that can be used for sustainable transport would be crucial in selecting and rolling out new transport technologies. Equally, historic flooding notices and flood maps are invaluable for this sector as flooding brought on by climate change can have significant knock-on effects on the energy needs of the county and the development of energy infrastructure.

4. **A strengthened local energy industry within Greater Lincolnshire through:**
    a. **A strong energy industry – generating jobs, upskilling people, and supporting local supply chains:** Data from NOMIS is crucial in understanding the energy sector in Lincolnshire with regards to the jobs and skills available. The website has significant data that could help extrapolate not just the current state of affairs – how many people are employed, on what level, and what skills they have – but also how things might change in coming years. The energy sector in Lincolnshire in particular has a large population of workers over the age of 50 who would be expected to retire in the coming years – and the number of young people entering the workforce does not appear to match that number.
    b. **A strong water and waste management sector:** As with the energy industry, the data from NOMIS can help illustrate the current state of skills and workforce availability, as well as predict future challenges. Furthermore, understanding the types of jobs that are likely to come as the sectors become more efficient is crucial, which is why reports like the [UK Probability of Automation](#) are important.
    c. **An energy sector that supports local as well as national needs:** Datasets that pertain to the energy performance of buildings – both private and public, can help with more accurate predictions for the energy that can be produced within Greater Lincolnshire and how it can be used. Furthermore, all environmental data from the ONS could be used in order to understand local and national needs, and better adjust new initiatives in the energy sector to those needs.

Gaps in the Open Data on the Sector

The data available on the energy sector is diverse and varied. It also comes from a number of different sources, which is good from a research standpoint as it provides an opportunity to cross-reference and enrich existing datasets. However, the usefulness of the data for the sector is reliant on the datasets being updated frequently. On the local level in particular, updates on Fuel Poverty, the JSNA for Health and Social Care, and the Lincolnshire County Energy Brief are crucial in helping stakeholders engage with the work.

In terms of data that is missing or incomplete, the following have been identified as potentially having a crucial impact on the future needs of the energy sector:

- Flooding, flood risks, flood mitigation: While the environment agency has been releasing multiple datasets pertaining to floods and historic flood warnings, local data related to flood risks and flood mitigation needs to be released frequently and publicly. This would help the planning and development, not just of new builds, but also the selection and rolling out of new sustainable transport networks. Furthermore, data related to flood risks and flood mitigation has the potential of being life-saving, particularly when used by the health and social care sector to plan for times of crisis.
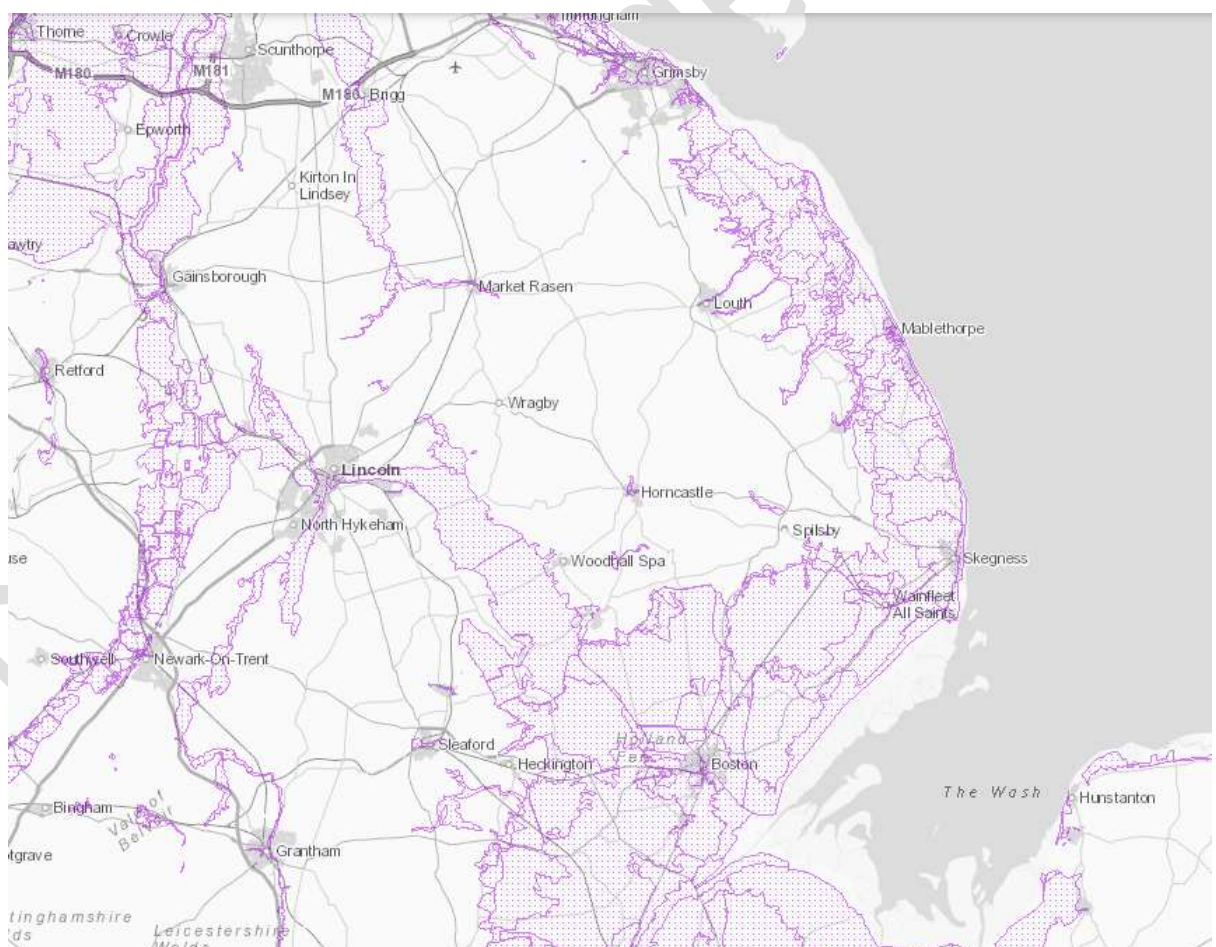

Figure 5: DEFRA Historic Flood Warnings Map

Figure 6: DEFRA Flood Map for Planning Rivers and Sea Flood Zone 2

- Automation and the workforce: The last probability of automation report pertained to the risks of automation for various industries in 2011 and 2017. Data pertaining to actual automation of industries in Lincolnshire, and the risk of the energy and water management industries becoming more automated in 2020, will be crucial. Some information that may not have been included in the original report by the ONS, could pertain to the existing skills of the workforce, the makeup of that workforce (in age, in qualifications, in fitness for work) and the supply of overseas labour following Brexit. All these factors could potentially have an impact on the probability of automation – and with it, the competitiveness of the Lincolnshire energy sector – but it is unclear how many of them were included in the last report.

- Skills on-flow and off-flow: Closely connected to the question of automation is the supply of skills and the number of new entrants in each industry compared to the number of recent and future retirees. Lincolnshire as a county has an aging demographic, and the workforce of the energy and water industries is made up of a high percentage of over 50's, and a very small percentage of under 25's. This may reflect the changing nature of the work, but it could also mean that a loss of insider knowledge and skills will be imminent unless the people retiring from the field are given the option to transfer that knowledge within the company.

- Land usage as well as land assets.

- Data from neighbouring LEPs and publicity on data from neighbouring LEPs: While some local authorities have been working hard on publishing open data, many more have not done so or publicised their open data repositories in a way that drives traffic and knowledge sharing. As such, there is likely a wealth of data available which has not yet been shared and used to the best of its potential.

Appendix 2: Data signposting March 2020

Once participants were comfortable with having identified some key challenges for energy in Lincolnshire, they were also asked to think of datasets that they used for each of these themes, as well as the datasets they hoped they could have access to in the future. They were also shown the preliminary results from this report and asked to consider what else is available to them.

Among the datasets identified were the following:

Who pays?
- GMCA CBA Tool
- Climate Just
- Met office cc data
- Heat networks research
- HNIP

Infrastructure:
- Domestic Chargepoint analysis
- Wastedataflow - Records LA waste outputs and materials flow
- MapThat for geographical info, measurements, can overlay financial info such as business scales
- Scatter
- UKRN Data Sharing for infrastructure
- MappingGM
- EU ETS
- European Emissions Trading Scheme
- WPD flexible dataset

Housing:
- MHCLG new houses build data
- Household Waste and Recycling
- Energy Use

Social:
- Fuel poverty in Lincolnshire

Labour:
- The catch training centre provides data on apprentices in the region
- Nomis
- BRES Business register and employment survey
- Travel to work data

Climate change:
- Met office
- Weather station data
- UK CPIs
- Modelling data
- Declare a climate emergency website
- CO2 emissions

Transport
- Guide to managing grey fleet mileage

Waste management
- Circular material use rate
- NESTA Smart resources (not open)