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Evidence Base

Updated Evidence Base for Worcestershire Energy Strategy

Prepared for
Worcestershire LEP

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1. Introduction

This report is an interim document, setting out the evidence base for Worcestershire that will feed into the creation of an energy strategy for the county. It sets out the documents that have been considered, and the areas they cover, as well as identifying the gaps in the evidence base and what needs to be added to this to make it more comprehensive. This is a review of the previous work, to make up part of the energy strategy evidence base. Encraft can therefore ensure that work developing the energy strategy successfully complements and builds on previous studies.

We have broken the evidence base down into a number of key areas as set out below:

- Strategic documents and policy
- Energy Supply and demand
- Carbon emissions
- Energy infrastructure
- Energy efficiency
- The low carbon economy

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2. Strategic documents and policy

2.1 Strategic Documents

2.1.1 National Strategy

Industrial Strategy

The government's Industrial Strategy Green Paper of January 2017 set out ten pillars to drive UK growth (1), including particular focus on science, research and innovation. The Green Paper also set out a number of ways in which investment in energy infrastructure and support for the low carbon economy would play an important role in delivering the country's growth ambitions.

This was followed up by the Industrial Strategy White Paper in November 2017 which set out five foundations of productivity to transform the economy; ideas, people, infrastructure, business environment and places (2). This also set 'Grand Challenges' to put the UK at the forefront of the industries of the future in areas of:

- Clean Growth
- AI and Data Economy
- Future of Mobility
- Ageing Society

Government committed to £725m of funding for challenges within the second wave of the Industrial Strategy Challenge Fund, to capitalise on Britain's strengths in research and innovation, and help deliver the Grand Challenges, investing in areas such as:

- Clean Growth
  - Transforming construction
  - Prospering from the energy revolution
  - Transforming food production
- AI and data
  - Audience of the future
  - Next generation services
- Ageing Society
  - Data to early diagnosis and precision medicine
  - Healthy ageing
- Future of Mobility
  - Driverless cars

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2.1.2 Clean Growth Strategy

The Clean Growth Strategy sets out how the UK will grow the national income while cutting greenhouse gas emissions, in line with the target to reduce carbon emissions by 80% by 2050 and the five year carbon budgets leading up to that. The Clean Growth Strategy covers the period up to and including the fourth and fifth carbon budgets, leading up to 2032.

There are a number of commitments in the energy sector made as part of this strategy, (3) in several key areas, including:

- Improving business and industry efficiency
- Improving homes
- Accelerating the shift to low carbon transport
- Delivering clean, smart, flexible power

A few of the key commitments are highlighted below.

Improving homes

- An extension of the Energy Company Obligation, ECO, out to 2028 including a review of the best way to do this beyond 2022
- Consulting on the regulations requiring minimum energy efficiency standards in the Private Rented Sector (PRS) from April 2018 and developing a long term trajectory to improve energy performance of as many as possible to EPC Band C by 2030
- Phasing out the installation of high carbon fossil fuel heating in new and existing homes currently off the gas grid during the 2020s, starting with new homes

Most areas of the UK, including Worcestershire, have significant energy demands from domestic properties. While the extension of the time frame of the ECO programme gives some level of consistency in the funding for schemes, the planned programme from September onwards will not necessarily support off gas households. The consultation proposed the removal of funding for oil heating and no longer being able to combine ECO and RHI limiting the business case for funding measures such as air source heat pumps. This will leave night storage heaters or LPG as upgrade options.

Across the national housing stock the sector with the highest proportion of F and G Energy Performance Certificate, EPC, ratings is the private rental sector (PRS). Conversely, councils and housing associations have been very proactive in upgrading their worst performing stock, typically with internal targets to achieve a SAP C rating across their portfolio within the near future. Owner occupied properties are typically less likely to have undergone retrofit, but there has been more progress made here than in the private rental sector, where landlords have little to no incentive to improve the energy efficiency of their stock in a market where housing demand often exceeds supply. The minimum energy efficiency standards for the PRS have been signposted for some time and will make it illegal to rent out F and G rated properties, although whether this can be effectively enforced remains to be seen. It is unclear on enforcement of these regulations, and a number of landlords could claim exemptions if the cost of improvements is set too low.

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Plans to phase out installation of high carbon fossil fuel heating in homes off the gas grid could be important for Worcestershire, given the rural nature of some of the area. Focus is initially on new homes, which are easier to tackle, but there will also be policies put in place to encourage retrofit of low carbon heating systems to existing properties using oil, LPG or solid fuels.

A contributing part of this will be the continuation of the Renewable Heat Incentive (RHI) to encourage take-up of technologies such as heat pumps, biomass boilers and biomethane. Beyond this government are considering a range of policy options and will involve consumers and industry in developing new policy.

Low carbon transport

- To meet the 2050 targets, almost every car and van will need to be zero emission by 2050. The Government has announced an end to the sale of all new conventional petrol and diesel cars and vans by 2040
- The Government will set out further detail on a long-term strategy for the UK's transition to zero road vehicle emissions by March 2018.

The end of petrol and diesel vehicle sales by 2040 will not mean an end to petrol and diesel vehicles on the roads immediately, however this policy means a decline in numbers of these vehicles is expected leading up to this date and an increase in alternatively fuelled vehicles, such as hydrogen and electric vehicles, is likely to be seen.

The major impacts of this are twofold, firstly the growth of electric vehicle numbers will need to be accompanied by a growth in charging points and associated infrastructure to ensure travel remains unimpeded. As electric vehicles are produced that can travel longer distances without recharging, the importance of rapid chargers increases. These are chargers such as the Tesla Supercharger that require over 50kW of power and can charge a battery to 80% in 30 minutes. The distribution of these chargers will potentially be limited by the pre-existing grid constraints in Worcestershire which could prevent the drawing of such significant amounts of power in certain areas, potentially requiring innovative solutions such as chargers co-located with generation and storage to make this viable.

Almost all major car manufacturers have either already produced an electric vehicle or are working on their first model, which shows the direction of travel of the industry. While much of this was already underway, the government announcement has provided added impetus to manufacturers to manoeuvre themselves ahead of the competition. This represents both a problem and a potential opportunity, as new technology requires new supply chains to be put in place to deliver this. New and existing suppliers in the Worcestershire area could be well placed to fill newly emerging supply chain gaps and use their existing relationships with manufacturers to diversify.

Business and Industry

- Enable businesses and industry to improve energy efficiency by at least 20% by 2030.
- To achieve this Government will put in place a simpler, more ambitious and long-term regulatory framework to:
  - Make it easier for business to identify energy savings

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  - Ensure improvements in the leasing sector and in new commercial and industrial buildings
  - Help to understand how the Government can encourage greater investment in energy efficiency measures and technologies
- Phase out the installation of high carbon forms of fossil fuel heating in new and existing businesses off the gas grid during the 2020s, starting with new build

These policy areas are focused on helping businesses cut energy consumption, and through this cut energy costs, making them more competitive. Businesses in Worcestershire could benefit from energy efficiency support to become more competitive.

One of the options being considered is establishing a minimum energy performance standard for commercial buildings to incentivise landlords to invest in energy efficiency measures which could reduce energy consumption for their tenants.

Other than energy efficiency they are particularly interested in phasing out high carbon forms of heating, such as oil. This will initially be targeted using the Renewable Heat Incentive (RHI) but a successor policy to this is likely to be put in place, potentially including stronger carbon pricing.

Smart, flexible power

- Around £900 million of public funds between 2015 and 2021 in research and innovation invested in the power sector including:
  - £265 million in smart systems to reduce the cost of electricity storage, advance innovative demand response technologies and develop new ways of balancing the grid, and;
  - £177 million to further reduce the cost of renewables
- Implementing the smart systems plan, which will help consumers to use energy more flexibly and could unlock savings of up to £40 billion to 2050
- Target a total carbon price in the power sector which will give businesses greater clarity on the total price they will pay for each tonne of emissions.

Grid constraints within Worcestershire, as discussed in the following sections, mean that there could be opportunities for smart grids and flexible power provision to alleviate some of these constraints. The Distribution Network Operator (DNO) that owns and operates the electricity infrastructure within Worcestershire is responsible for the network, and is currently transitioning from DNO to Distribution System Operator (DSO) which will involve more active local management of network load, generation and constraints (4).

The government's investment in innovation includes £265 million in the area of smart systems aiming to reduce the cost of electricity storage, advance innovative demand response technologies and develop new ways of balancing the grid. These are technology areas that could prove beneficial to Worcestershire, and indeed it may be possible to identify sites within Worcestershire that could operate as pilot sites for feasibility studies investigating these opportunities.

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The Feed-In tariff is due to be phased out in 2019, so the update promised is welcome as it will provide clarity on the likely development of small scale renewable generation beyond this. Renewable energy auctions – through the Contracts for Difference (CfD) mechanism will continue, these are focused on large scale renewables.

Public Sector Leadership

- A commitment to introduce a voluntary public sector target of 30% reduction in carbon emissions by 2020-21
- Provide £255 million of funding for energy efficiency improvements in England and help public bodies access sources of funding

This is something that should be monitored closely, as while the initial proposed target is only voluntary there is likely to be a consultation on plans to introduce a mandatory target by 2025. This will require local authorities to review their Carbon Management Plans and take steps to reduce carbon emissions in line with the targets put in place. Funding for energy efficiency improvements will enable these targets to be met.

Local leadership

- Support for local energy strategy development
- Local Energy programme to support local areas to play a greater role in decarbonisation
- Support for LEPs and local authorities to access clean technology innovation funds

The clean growth strategy recognises that moving to a productive low carbon economy cannot be achieved by central government alone; it is a shared responsibility across the country. Local areas are best placed to drive emission reductions through their unique position of managing policy on land, buildings, water, waste and transport. They can embed low carbon measures in strategic plans across areas such as health and social care, transport, and housing.

The Government have recognised the importance of local action on decarbonisation and so are putting in place resource to support LEPs and local authorities to take action.

2.1.3 Government support for local energy

BEIS local energy hubs

BEIS have identified that barriers to progression towards a low carbon economy at a local level include 'limited capacity and capability amongst Local Enterprise Partnerships (LEPs) and local authorities' to deliver local energy investment.

The BEIS Local Energy programme is designed to address the gap in the capacity and capability of LEPs and other local organisations. Part of this involves funding LEP Energy Strategies to understand the opportunities and challenges across each LEP area.

The overall aim of the BEIS proposal is to provide a series of local energy hubs across England (5) that, via staff and funding, will:

- Develop and prioritise a pipeline of local energy projects identified through LEP and partner energy strategies and take these projects from concept to business cases that attract investment and are then taken forwards to implementation by other partners.

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- Help coordinate local action across several local LEP areas.
- Provide a local good practice link between local LEP activity, other local LEP areas, and national Government.
- Energy Efficiency, generation and smart distribution across the public estate and social housing
- Building integrated clean and smart generation for larger sites and underused land, including heat and power networks and storage (electric/hydrogen)

There will also be capacity to enable better sharing of best practice in other areas between the local LEPS and local authorities.

Heat network support

One element of government support for local energy that is well established is the funding from the Heat Network Development Unit (HNDU). This has been running since 2013 and was set up to address the capacity and capability challenges which local authorities identified as barriers to heat network deployment in the UK.

Government are keen to support the development of heat networks because they can enable a transition to lower carbon heating sources, and can be effectively implemented using a variety of different heat supply technologies. Once the infrastructure is in place, even if carbon emitting fuel sources such as gas boilers are used to supply the heat initially, it will be possible in future to replace the central plant used to supply the heat with lower carbon options without causing any disruption to the homes or businesses supplied, therefore enabling easier decarbonisation of heat supply.

HNDU provides support to local authorities in England and Wales through the early stages of heat network development:

- Heat mapping
- Energy master planning
- Techno-economic feasibility
- Detailed project development
- Early commercialisation

This funding enables local authorities to explore the potential opportunities for heat networks within their towns and cities, and move from there through feasibility to initial commercialisation to a point where a local heat network may become commercially viable. Local authorities within Worcestershire have been proactive in exploring these opportunities.

Many of these studies have identified networks where the commercial returns are marginal, and are unlikely to be taken forward by the private sector; this has led to capital funding being made available by government to support these in order to overcome initial economic barriers to investment. This funding is known as the Heat Networks Investment Project (HNIP), and is a £320m capital investment programme providing support for the capital costs of heat networks. So far £24m of support has been provided to a total of nine local authority projects.

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2.1.4 Local strategy

Strategic Economic Plan
The 2014 Strategic Economic Plan outlines Worcestershire's growth ambitions and sets out the three keys sectors of advanced manufacturing, agri-tech and cyber-security, defence and IT as opportunity areas (6). The SEP also sets out the goal of reducing carbon emissions while meeting growth ambitions. An ambition to increase local energy generation is set out, with local geothermal energy development proposed as a key means of achieving this.

The SEP identifies a commitment to '*source locally a higher proportion of energy needs, particularly from zero and low-carbon sources*.' It also commits to a Low Carbon Business Support Programme providing resource efficiency funding – Worcestershire's BEEP programme.

WLEP has identified four cross-cutting themes, all of which can have energy as a key part.

- Environment and sustainability
- Technology and Innovation
- Inclusion
- Research and Intelligence

2012 - 2020 Worcestershire Partnership Climate Change Strategy

This document sets out Worcestershire's commitments to combating climate change, with a number of key initiatives including:

- Building the low carbon economy
- Reducing the county's carbon emissions by 30% from 2005 levels by 2020
- Putting in place adaptation plans for climate change
- Empowering people to take action

2016 Updated Worcestershire ESIF Strategy

The LEP has developed a set of ambitions for use of ESIF funds which complement and reinforce the objectives within the Strategic Economic Plan. Key areas include use of funds under the priority of 'Research, Technological Development and Innovation (RTDI) and ICT' to support Research and Innovation, and goals under the 'Environment and Place' priority, which includes priorities of:

- Supporting the Shift Towards A Low Carbon Economy In All Sectors
- Preserving and Protecting the Environment and Promoting Resource Efficiency

2017 Worcestershire Local Transport Plan 4
The local transport plan focuses on new transport infrastructure schemes which will deliver significant benefits to Worcestershire's economy, environment and quality of life. There are a number of policy and guidance documents that sit alongside the Local Transport Plan that provide guidance in areas such as electric vehicle infrastructure provision. The council provides streetscape design guidance that:

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"strongly encourages all properties to be equipped with Ultra Low Emission Vehicles (ULEV) charging points including provision where communal parking is provided. This position is supported by the National Planning Policy Framework (NPPF)."

It also sets out that ULEV charging systems should be:

- Residential: 7kW charging points.
- Non-Residential: 22kW charging points.

Some further key transport policies are highlighted below.

Policy Number	Details
IPT7	Promote and support uptake of Ultra-Low Emission Vehicles in Worcestershire's taxi fleet, to support improvement in urban ambient air quality
IPT8	Working with coach operators to support upgrade of vehicles towards Ultra-Low Emission Vehicles (ULEVs).
TCC2	Worcestershire County Council will adopt a proactive approach towards ultra-low emission vehicles (ULEVs) and associated infrastructure, in line with Government policy. As all new cars will be required to be an ULEV by 2040, Worcestershire County Council will seek to: • Expand on its existing county-wide network of public charge points; • Encourage businesses to provide workplace charging facilities for employees and customers; • Ensure that developers are aware of ULEV guidance provided in the Streetscape Design Guide; • Support access to charge points for residents without off-street parking; • Facilitate (where possible) adoption of new and improved technologies and charging infrastructure developments (such as easy payment access); • Explore the provision of dedicated charge points for taxi and private hire operators; • Encourage bus operators to implement an ultra-low emission fleet and associated infrastructure; • Work with partner organisations to support educational programmes that encourage the take-up and use of ULEVs; and • Develop business cases and funding bids to access the funds needed to implement ULEV measures.

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TCC3	Worcestershire County Council will seek to minimise energy consumption and enhance the energy efficiency of its transport maintenance and construction operations and assets through a range of measures. This will include, where appropriate: • Dimming of streetlights during the hours between midnight and dawn; • Continuing to rationalise periodically the number of existing lamp columns; • Considering new street lighting and lit signs only where there is a statutory requirement or safety and security imperative to do so; • Investigation of new technology to establish if this will deliver energy efficiencies; and • Increased recycling of materials. Wherever possible clauses will be included in commissioned contracts to encourage contractors to work towards this policy.
TCC5	Worcestershire County Council will ensure that climate change mitigation is considered in all local transport policy, strategy and scheme development and delivery. This will be done in compliance with and using guidance from national policy.

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3. Energy use and generation

Statistics available through the data.gov.uk site have been used to update the evidence base for Worcestershire. This work establishes a baseline energy and carbon analysis that can be used in the next phase to look at the Energy Strategy opportunities for Worcestershire. Some of this data is available on a local authority level, some more granular, and others only on a regional basis, in which case assumptions have been made to apply this to Worcestershire.

3.1 Energy use

Figure 1 shows the split of overall energy use by sector and fuel type in Worcestershire. This breaks down the consumption by domestic/non-domestic use and final fuel consumed, i.e. electricity, gas, coal, bioenergy and road transport fuels.

It can be seen that road transport makes up 44% of energy consumed in Worcestershire and is the largest single energy use sector. The second largest energy use sector is domestic gas, accounting for 22% of the total energy use in the county. Non-domestic gas accounts for 9% of the total energy demand. Gas is the main fuel used, demonstrating the relatively wide access to the gas network within Worcestershire. Domestic coal and other fuel use totals to 2.7%, non-domestic coal and other fuel use totals to make up 7% of total energy use, indicating that there is still some energy demand that is met by high carbon fuels such as oil and coal rather than gas or electricity.

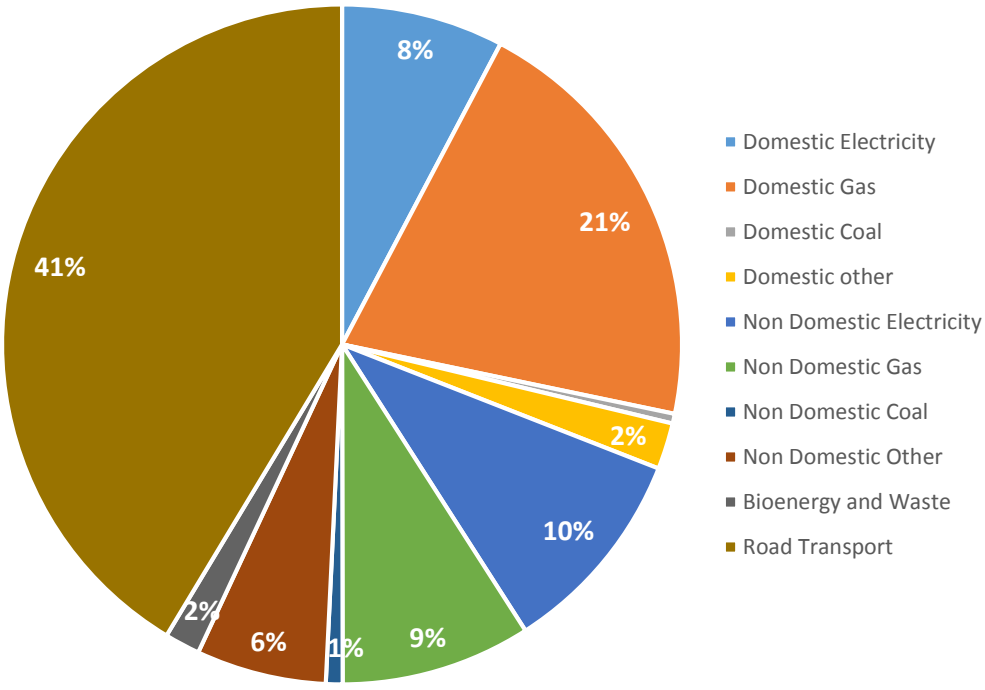

Figure 1: Energy use by fuel and sector in Worcestershire (7)

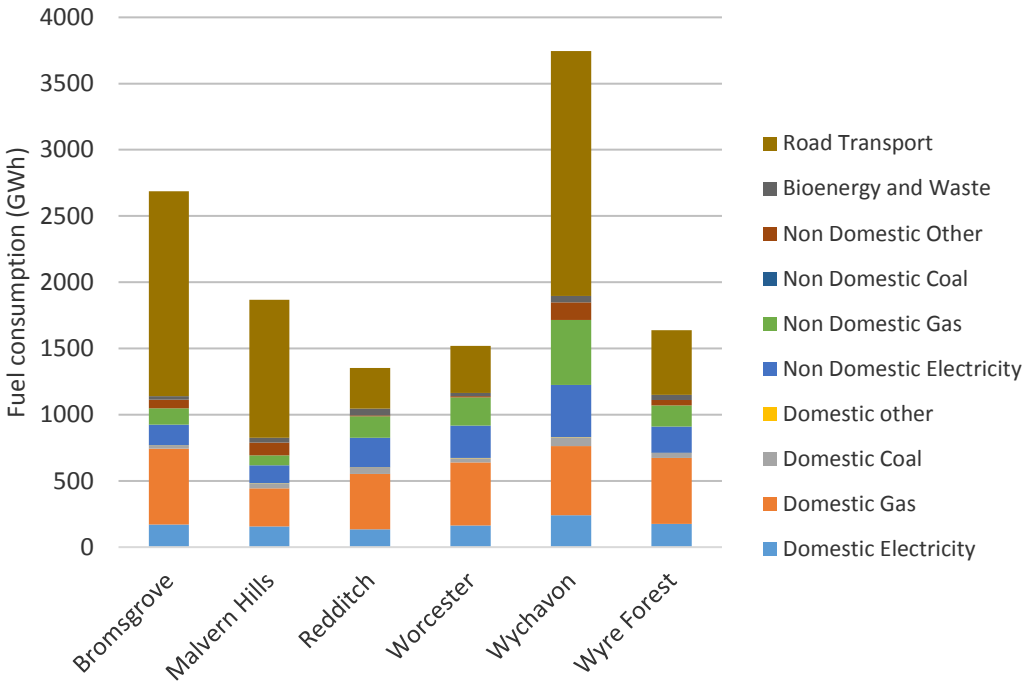

Figure 2: Energy consumption by fuel and by sector per local authority (7)

Figure 2 shows the split of overall energy use by sector and fuel type in Worcestershire. The consumption is broken down by domestic/non-domestic use and final fuel consumed i.e. electricity, gas, coal, bioenergy and road transport fuels. Road transport is the single largest energy use in many of the local authority areas. Domestic gas consumption is significant, representing the large fuel demands for heating homes, while non-domestic energy use vary with the levels of industry in the district. One of the highest non-domestic energy demands is seen in Wychavon. Figure 3 shows the same data but with motorway road transport energy consumption excluded, it can be seen that this has a significant knock on effect on energy consumption in Bromsgrove and Wychavon.

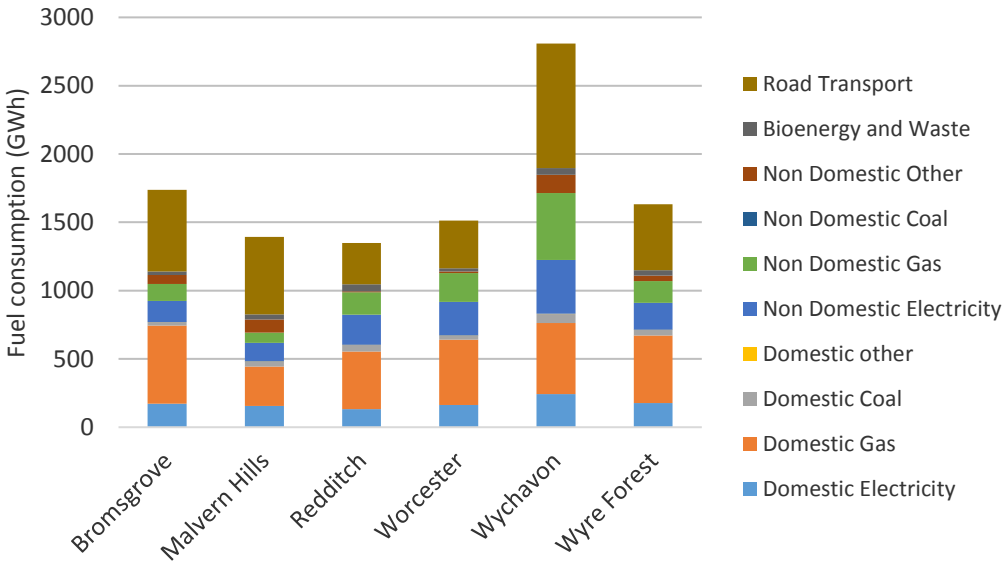

Figure 3: Energy consumption by fuel and sector per local authority excluding motorway road transport

Figure 4 presents the energy use by sector in Worcestershire excluding motorway contribution to road transport. Energy use by sector is typically split approximately into thirds. In Worcestershire transport makes up 31% of the total energy use. Domestic energy use accounts for 39% of the total energy use and is higher than the non-domestic energy use (30%). A decreased proportion of non-domestic energy consumption compared to domestic and transport energy consumption could represent a differing ratio of industry to population to the national norm. It could also point to a lower density of businesses that are large energy users.

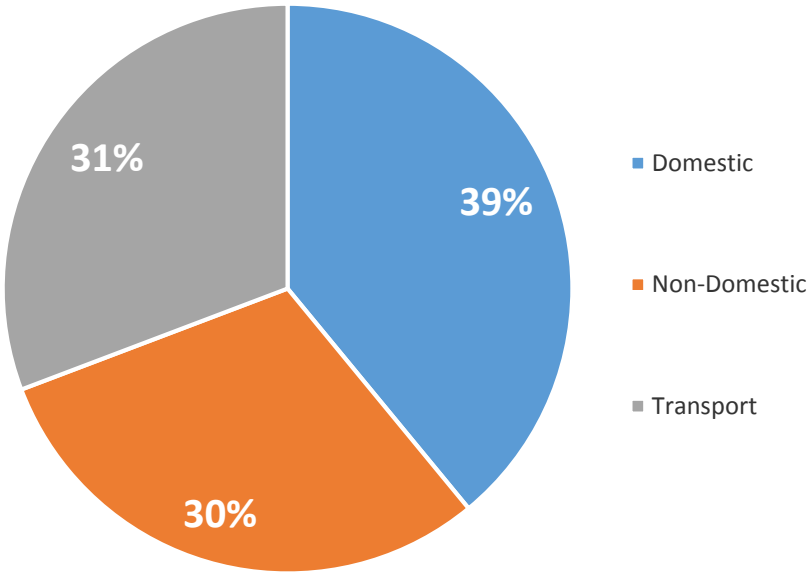

Figure 4: Energy use by sector (7)

3.1.1 Heat demand

Figure 5 shows that the majority of heat demand in each local authority area is for domestic premises, with the bulk of the rest made up of non-domestic demand and a small amount for serving for transport related premises. The domestic demand is easily understood, and is made up of heat to people's homes, supplied by a range of different fuel sources.

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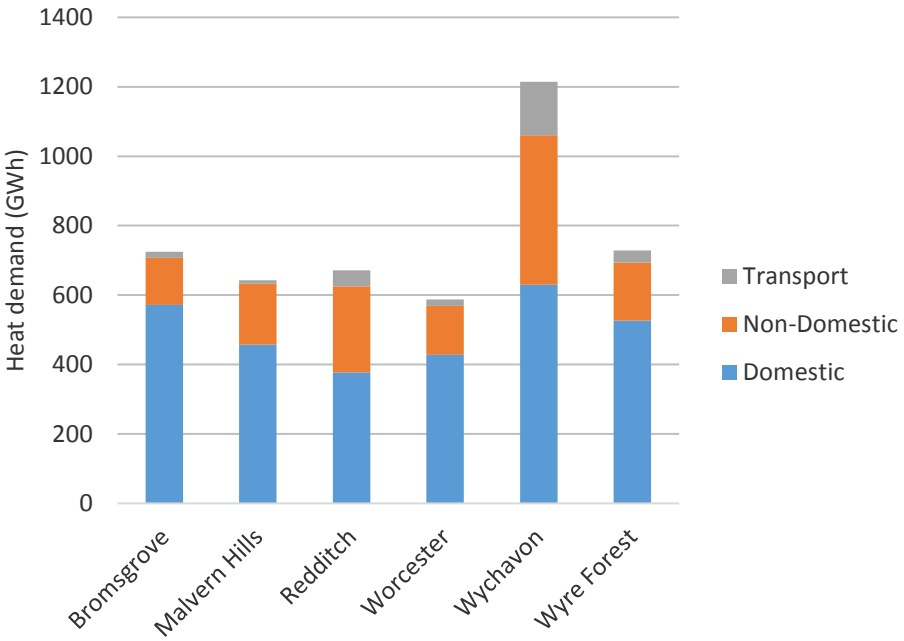

Figure 5: Heat demand by sector and local authority area

The non-domestic heat demand is broken down further in Figure 6. The proportion of heat demand for industrial buildings is significant in many of the local authority areas, with other significant contributions to total heat demand from Transport, Retail and Commercial Offices. This analysis helps to understand the potential opportunities that may exist for heat networks or provision of alternative heating options in non-domestic premises.

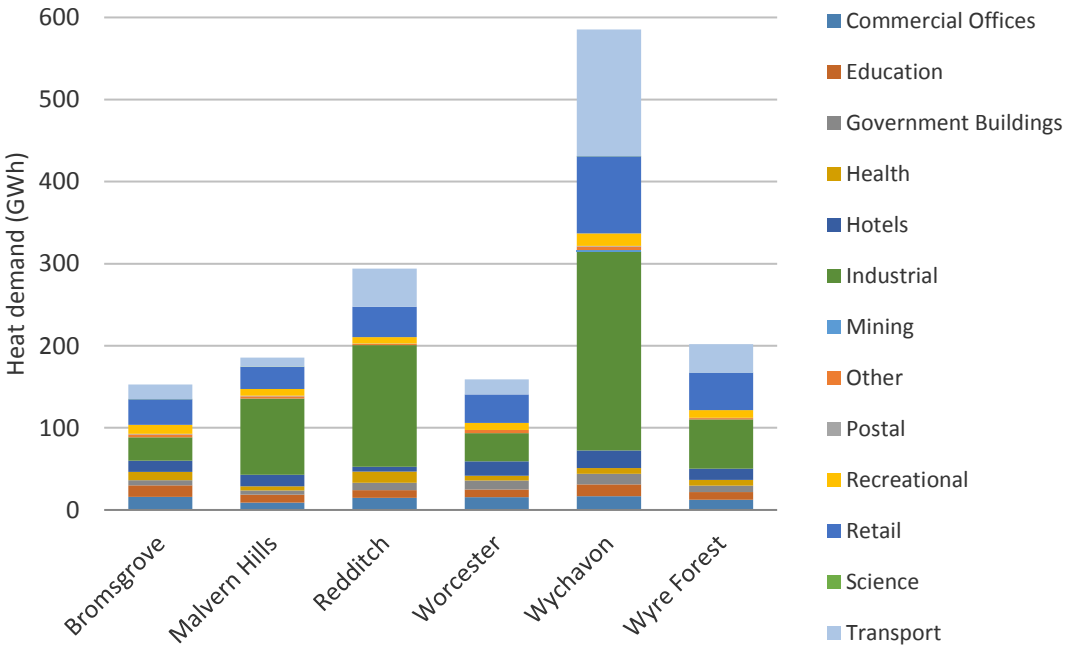

Figure 6: Non-domestic heat demand by industry and local authority area

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3.2 Energy generation

3.2.1 Renewable energy generation

Figure 7 shows the operational large-scale (>1 MW) renewable deployment in Worcestershire, as identified in the Renewable Energy Planning Database (REPD). This database covers all large-scale renewable development and is complied with reference to a number of data sources including feed-in tariff deployment and local authority planning data so should be comprehensive for large-scale projects. The grey lines show the local authority boundaries within Worcestershire.

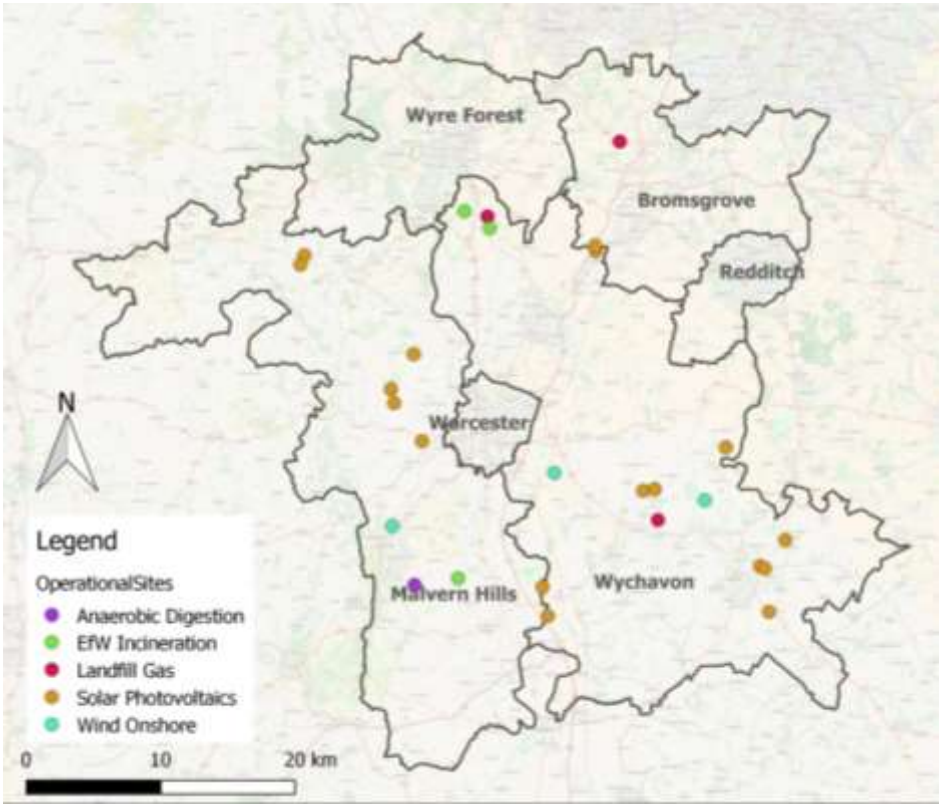

Figure 7: Worcestershire large-scale renewable deployment – operational sites

Table 1 summarises large-scale renewable installations throughout Worcestershire (8). There has been wider deployment of large-scale renewables in Wychavon and Malvern districts. In Wychavon installations include Energy from Waste (EfW) incineration, landfill gas, solar photovoltaics and wind technologies taking advantage of the wind resources in the county. In Malvern, renewable technologies such as photovoltaics, wind turbines, anaerobic digestion and EfW have been deployed. Outside the two districts there is only a landfill gas installation in Bromsgrove and no installations in the rest of the Local Authorities.

Energy from waste plants utilise waste from across Worcestershire and beyond, also processing waste streams from Herefordshire.

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Table 1: Summary of generation capacity in MW of large-scale technology installations by planning status and local authority area (8)

Row Labels	Bromsgrove	Malvern	Redditch	Worcester	Wychavon	Wyre Forest	Grand Total
Operational	**2.0**	**5.2**			**67.3**		**74.5**
EfW Incineration					15.5		15.5
Landfill Gas	2.0				5.0		7.0
Solar Photovoltaics		4.0			45.5		49.5
Wind Onshore		1.2			1.3		2.5
Awaiting Construction		**17.8**			**78.2**		**96.0**
Anaerobic Digestion		1.0					1.0
EfW Incineration		5.0					5.0
Solar Photovoltaics		11.8			78.2		90.0
Grand Total	**2.0**	**23.0**			**145.5**		**170.5**

The total electricity generation across the area is dominated by photovoltaics. There is also a significant contribution to local electricity generation using landfill gas.

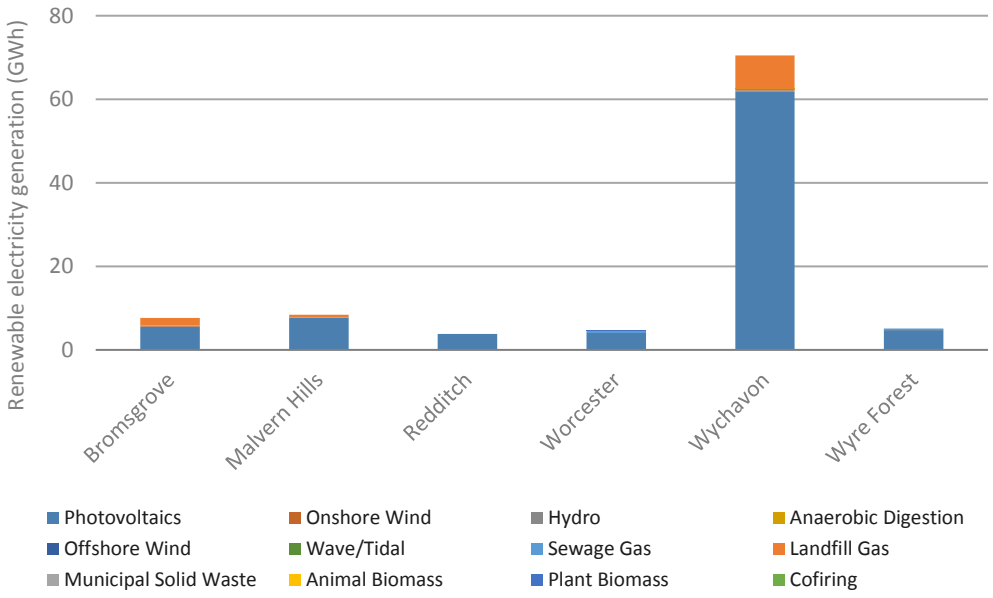

Figure 8: Worcestershire large-scale renewable deployment by local authority – operational sites (9)

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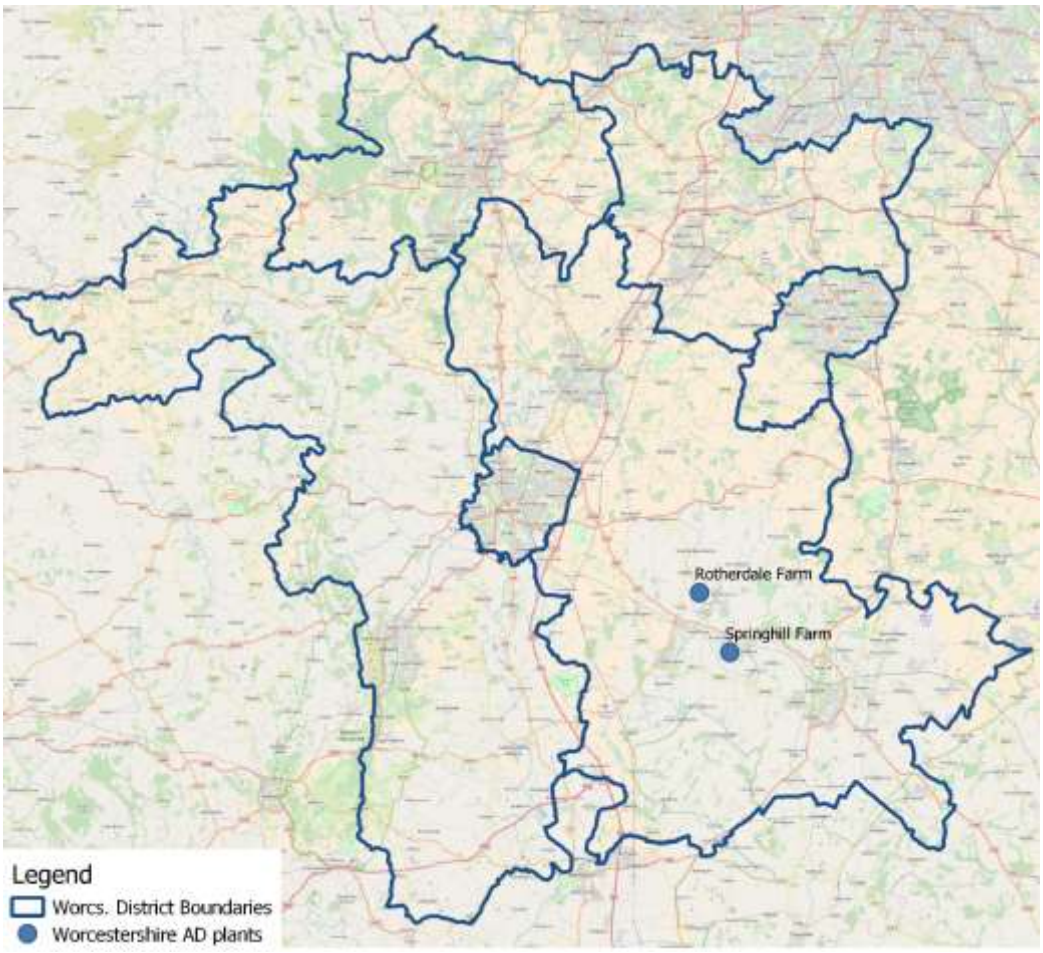

Figure 9: Worcestershire Anaerobic Digestion plants (10)

There are two further anaerobic digestion plants in Worcestershire, operated by Vale Green Energy and Evesham Vale Growers; these both produce biomethane.

3.2.2 Renewable energy potential

Table 2 sets out the maximum possible energy generation resource from different technologies that could be reached in the future. The data were sourced from a renewable energy capacity study for the West Midlands (11).

The study provides an assessment of the maximum potential resource of a number of different renewable energy options across the local authority area, following a standard methodology that was published by the Government for the English Regions in 2010 (12). The methodology takes into account a number of factors to estimate the total generation potential, including availability of natural resource, physical constraints and planning constraints. For example, for the calculation of sites suitable for large-scale wind generation, areas with wind speeds above 6m/s at 45m above ground level were assessed and urban areas, areas of outstanding natural beauty (AONB), areas with heritage designations and areas subject to aviation or military constraints were excluded. The methodology used does not account for the deployment of solar farms. Instead, it considers solar installations on properties only and there may be scope for further ground mounted PV which has not been captured in the study.

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From Table 2 it can be seen that Worcestershire has significant large-scale wind resource, as well as extensive potential heat generation from heat pumps. In addition, waste and biomass resources and potential for solar generation have been identified. It is worth noting that different technologies have different generation characteristic (such as intermittency) and, therefore, technologies with the same peak power output may not generate the same amount of energy in reality.

Small scale onshore wind is defined as sites with capacity of less than 100kW typically with only a single turbine, while large scale is all opportunities larger than this.

Table 2: Total renewables potential in MW for each local authority area by technology type across Worcestershire (11)

REGION	ONSHORE WIND (MW)		BIOMASS (MW)						HYDRO-POWER (MW)	MICROGENERATION (MW)				ALL RENEWABLES (MW)
	Large scale	Small scale	Plant	Animal	Waste	Landfill gas	Sewage Gas	Total gas	Hydro-power	Solar Photovoltaics	Solar water heating pumps	Ground source heat	Air Source Heat Pumps	Total
Bromsgrove	672	108	2.5	3.0	5.0	0.2	-	0.2	-	25	19	39	156	**1,030**
Malvern	2,035	115	4.4	5.4	4.0	0.1	-	0.1	9.0	26	23	42	168	**2,432**
Redditch	110	-	1.3	0.4	5.0	-	-	-	0.1	18	14	31	125	**305**
Worcester	0	-	1.1	0.1	7.0	-	1.0	1.0	5.0	20	17	38	150	**240**
Wychavon	2,259	148	7.0	5.0	7.0	1.0	-	1.0	8.0	35	30	60	241	**2,802**
Wyre Forest	546	23	2.4	1.0	5.0	-	1.0	1.0	3.0	24	19	41	164	**830**
Worcestershire	**5,622**	**394**	**18.7**	**14.9**	**33.0**	**1.3**	**2.0**	**3.3**	**25.1**	**148**	**122**	**251**	**1,004**	**7,639**

Table 3 shows a summary of total electricity and heat generation potential by local authority area, summarising the split by technology that is given in Table 2.

Table 3: Total energy generation potential in MW (11)

REGION	ELECTRICITY (MW)	HEAT (MW)	TOTAL (MW)	PERCENTAGE OF WORCESTERSHIRE TOTAL(MW)
Bromsgrove	815	216	1,030	13
Malvern	2,199	235	2,432	32
Redditch	135	171	305	4
Worcester	34	206	239	3
Wychavon	2,471	334	2,802	37
Wyre Forest	636	226	830	11
Worcestershire	**6,290**	**1,388**	**7,638**	**100**

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3.2.3 Other energy generation resources

A study on the Geothermal Potential in south Worcestershire (13) showed that there is good potential to retrieve substantial geothermal energy in Offenham, with further potential identified in other areas within Worcestershire including Throckmorton, Pershore, Worcester and Broadway. Potential for both deeper and shallower targets has been highlighted. The study suggested that a detailed overview of the available technologies would be required to inform exploitation strategies.

The findings of the report show that suitable reservoir conditions in at least three of the four sandstones reviewed are present at all locations with varying depths and temperatures. These conditions support the development of geothermal resources in all of the areas considered. The regional distribution of these resources across the Worcester Basin can be summarised as follows:

1. Shallower geothermal resource in the Bromsgrove and Wildmoor sandstones with lower potential reservoir temperatures due their depth; and

2. Deeper geothermal resources in the Bridgnorth sandstone with potential to deliver higher temperatures.

The deeper geothermal targets have the potential to be used through direct uses whilst the shallower resources could be used in conjunction with heat pumps to increase the temperature where higher temperature ranges are needed.

Both of the shallow and deep geothermal targets have the potential to contribute to significantly offsetting existing fossil fuel based technologies and contribute to the use of renewable energy and the development of district heating outlined in the masterplan for the five areas considered.

- The Offenham area shows potential for development of the shallower Triassic reservoirs to a maximum depth estimated at 1,350m with estimated temperatures of up to 51^{o}C and deeper targets in the Bridgnorth sandstone to a depth of up to 1,900m and temperatures of up 59^{o}C.
- The Throckmorton, Worcester and Pershore areas are located in the deepest parts of the Worcester Basin and have the most amount seismic line data coverage. The Triassic sandstones in these areas reach a maximum depth of 2,365m at Throckmorton and Pershore with estimated temperatures of up to 66^{o}C. The Permian sandstone reaches its maximum thickness over these areas to a depth of over 2,800m with an estimated maximum temperature of 73^{o}C. The Pershore area is more distal to the available well and seismic line data.
- The Broadway area is located the furthest away from the geological model data and in the south eastern part of the model. The base of the Triassic sandstone sequence in this area is estimated to be at a depth 1,500m and a maximum temperature of 52^{o}C has been estimated. The Permian Bridgnorth sandstone below this is estimated at a depth of 2,000m with a potential maximum temperature of 63^{o}C.

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4. Carbon emissions

In this section, Carbon is used as shorthand for greenhouse gas emissions. This is made up primarily of Carbon Dioxide (CO_2), but also includes other major greenhouse gases weighted by global warming potential to produce a single aggregate figure known as Carbon Dioxide equivalent (CO_2e). The following data come from the National Statistics publication *'UK local authority and regional carbon dioxide emissions 2005-2015'* (14), this utilises the subset dataset which excludes emissions related to areas entirely out of local authority control, for example motorway traffic carbon emissions.

Figure 10 presents the carbon emissions by sector for Worcestershire. Transport accounts for 35% of the total carbon emissions, whereas the domestic sector is 34% and the non-domestic sector accounts for 31% of the carbon emissions each.

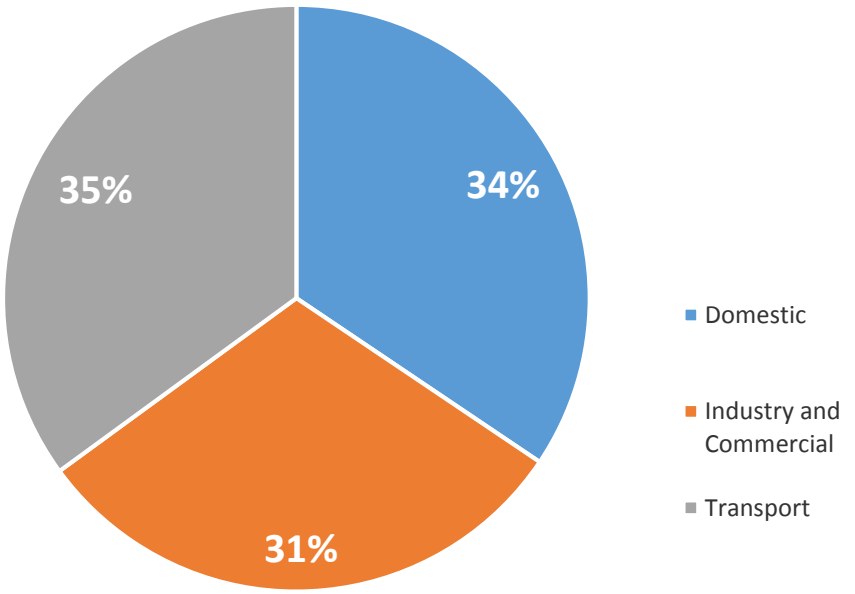

Figure 10: Worcestershire proportion of carbon emissions by sector (14)

Figure 11 shows the sectoral breakdown of carbon emissions between domestic, non-domestic and transport emissions. From this it can be seen that carbon emissions in Wychavon are the highest observed amongst the different local authorities. The second highest carbon emissions are presented in Bromsgrove and the lowest emissions in Redditch.

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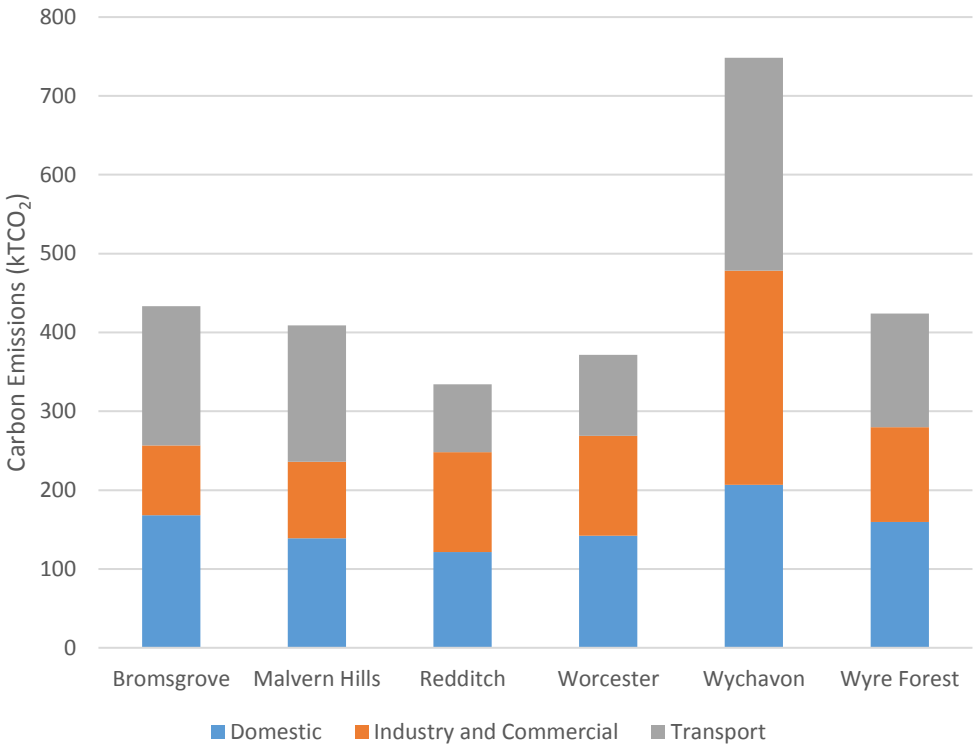

Figure 11: Total Carbon emissions breakdown by sector and local authority area (14)

Figure 12 shows the carbon emissions per person for each of the local authorities and by sector. Converting total carbon emissions figures for each local authority area to a normalised figure of tonnes emitted per person allows us to compare these figures on a more even footing, as well as a comparison to national benchmarks. Wychavon and Malvern Hills are above the benchmarks for the UK, whereas Wyre Forest, Redditch, Bromsgrove and Worcester fall below the benchmarks. The figures for Worcestershire in total are almost equal to the UK benchmark. This indicates that although the county in total is performing close to the national average, half of the local authorities present potential for improvement by lowering their respective values of carbon emissions per person.

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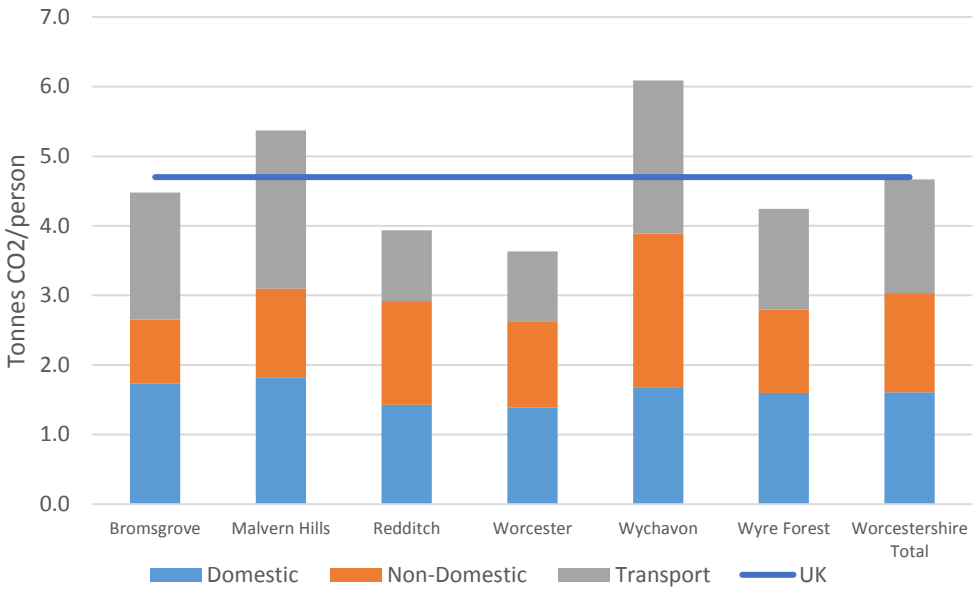

Figure 12: Carbon emissions per capita by category and local authority compared to national benchmarks (14)

Figure 13 shows domestic carbon emissions split by fuel consumed on a per household basis. A per household basis is most appropriate for comparison here as it is the number of households not the number of people that is more important in determining energy consumption. Domestic electricity consumption carbon emissions are similar across all areas, with some variation. Electricity consumption here includes electricity used for heating, so will be affected by the proportion of properties utilising electric heating as their primary domestic heating source. Higher variation can be observed in the carbon emissions due to gas consumption. The prevalence of gas as the heating fuel of choice minimises the contribution to emissions from 'other fuels' such as coal and oil. Areas with higher proportion of non-access to the gas network, such as Malvern Hills and Wychavon, have marginally higher emissions from 'other fuels.' This category includes oil and solid fuels such as coal which have significant carbon emissions and so will have a proportionately higher contribution to carbon emissions than to energy consumption alone.

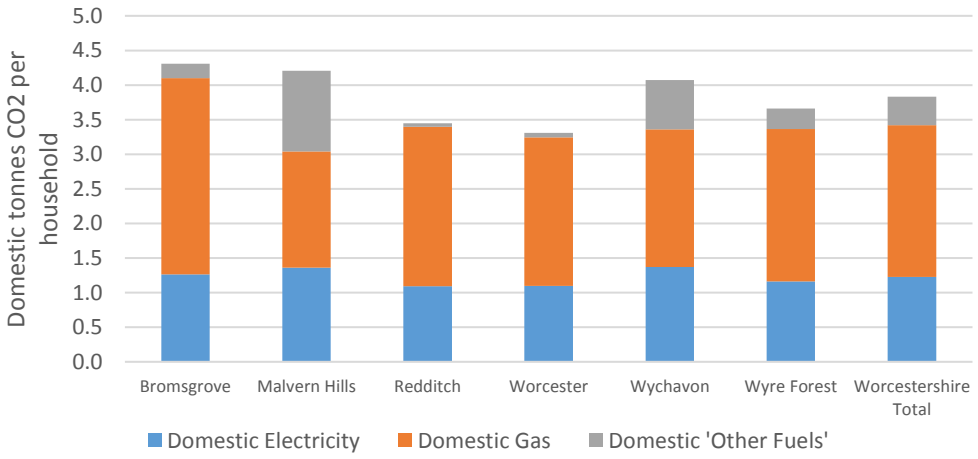

Figure 13: Domestic Carbon emissions by household (14)

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Figure 14 shows non domestic carbon emissions broken down by sector. From this it can be seen that the largest contributor to carbon emissions within each local authority area is typically industrial and commercial electricity use. The graph separates agriculture out specifically from industrial and commercial carbon emissions, and it can be clearly seen that agriculture to an extent to the larger, more rural areas such as Wychavon and Malvern Hills, but relatively little to that of more urban areas. Given the agricultural land within each local authority area this is to be expected, but it does highlight that for more rural areas to decarbonise they will also need to tackle carbon emissions from agriculture.

The main stand out from the graph is Wychavon, indicating the increased industrial activity in the area when compared to the other local authorities.

Carbon emissions from electricity use are not something that can be controlled on a local authority or regional level, given the interconnected nature of the electricity network and the responsibility of national government to set policy related to the electricity generation mix. However, current national projections show carbon emissions from electricity generation following the current trend and falling over time, indicating that carbon emissions from electricity use should decrease.

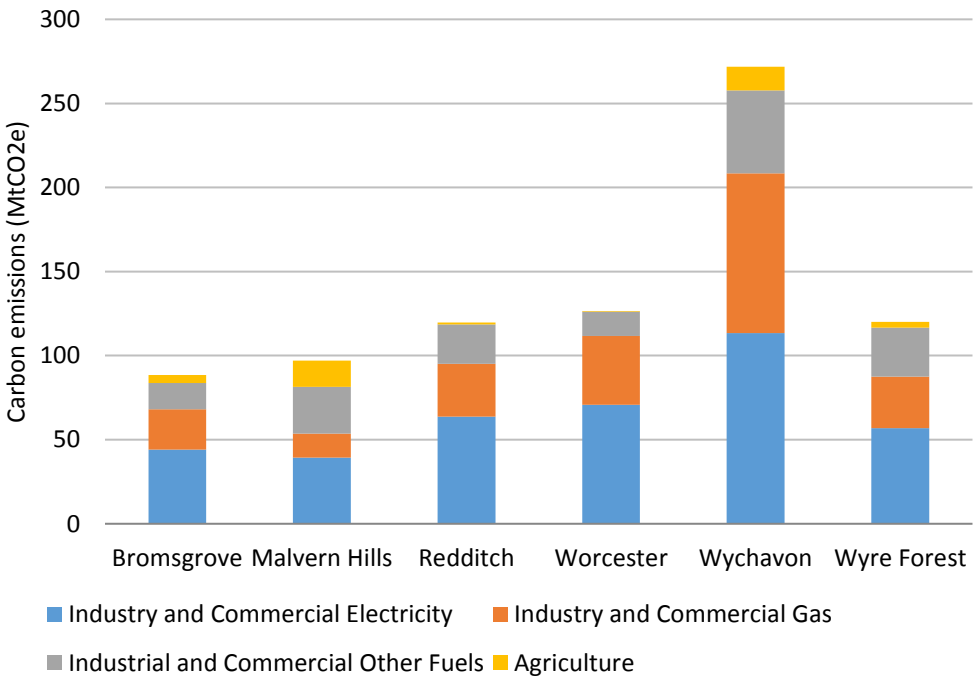

Figure 14: Non-domestic Carbon emissions broken down by sector and local authority area (14)

Figure 15 shows the same data as Figure 14, but presented on a normalised basis for ease of comparison. Total emissions have been set against total commercial floor area from Valuation Office Agency (VOA) statistics to produce a carbon emissions figure per metre squared of commercial floor area, which is then compared to the national figure. It can be seen that the majority of the local authority areas have emissions below the national average on this basis, some substantially below. This indicates that in some places where emissions have been relatively higher this is due to a concentration of industry in these places. Energy efficiency measures could help reduce industrial carbon

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emissions, and as set out in the Clean Growth Strategy (3), tackling commercial and industrial carbon emissions is an area that the government is looking at closely.

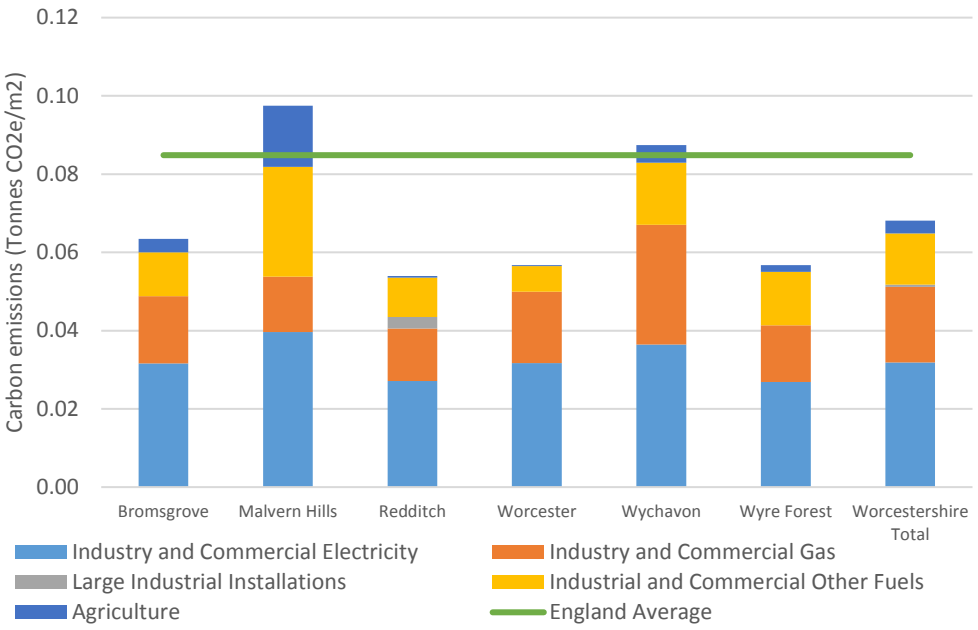

Figure 15: Non-domestic Carbon emissions per metre squared of commercial floor area by sector and local authority area (14)

In Figure 16 the data collected for 2015 and presented previously are being compared with predictions made in a study focusing on the carbon baseline and scenario modelling for Worcestershire (15). The study predicted a 13% drop based on the 2009 figures. The actual carbon emissions levels for the whole of Worcestershire seem to have dropped more than expected, by 17% from the 2009 levels.

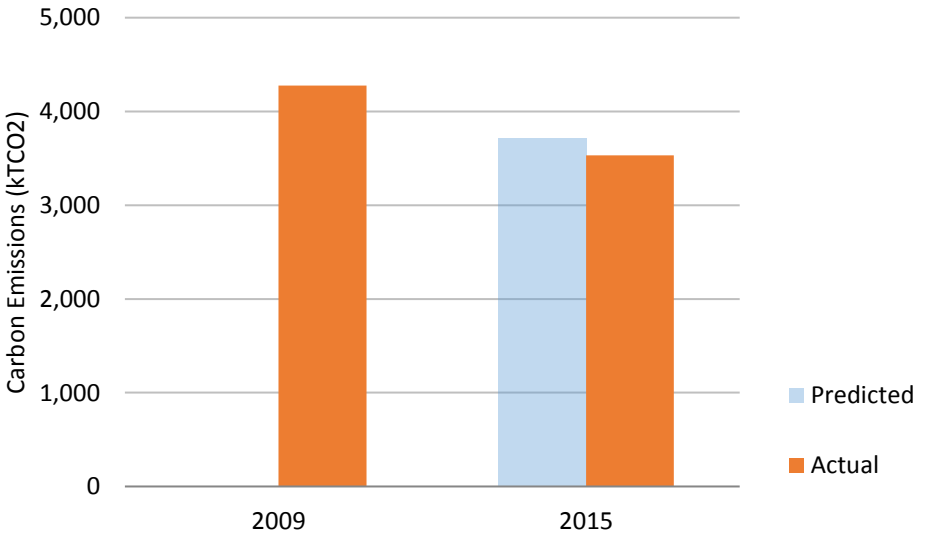

Figure 16: Carbon emissions for 2009, predicted for 2015 based on 2009 levels and the actual values for 2015 (15)

Figure 17 presents the predicted and the actual carbon emissions figures for 2015 for the different sectors in Worcestershire. Across all sectors, the actual values are lower than the predicted values with the exception of the transport carbon emissions that are

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slightly higher (1% higher than predicted). The change of land use sector presents the highest over-prediction with the actual values being 68% lower than predicted. The actual values for Agriculture were also significantly lower than the predictions (33% lower).

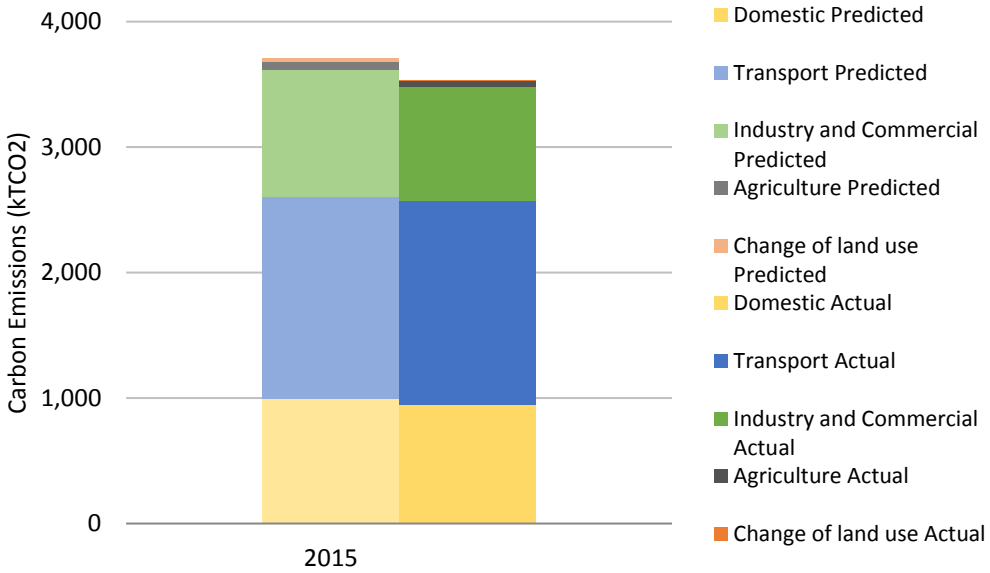

Figure 17: Carbon emissions per sector, as predicted and the actual values for 2015 (15)

5. Energy infrastructure

5.1 Electricity network infrastructure

The Long Term Development Statement from Western Power Distribution (16), which is the Distribution Network Operator (DNO) responsible for Worcestershire, has been reviewed, and the contents analysed and presented below. The electricity network in Worcestershire is shown in Figure 18 below, along with areas where there are constraints on the network.

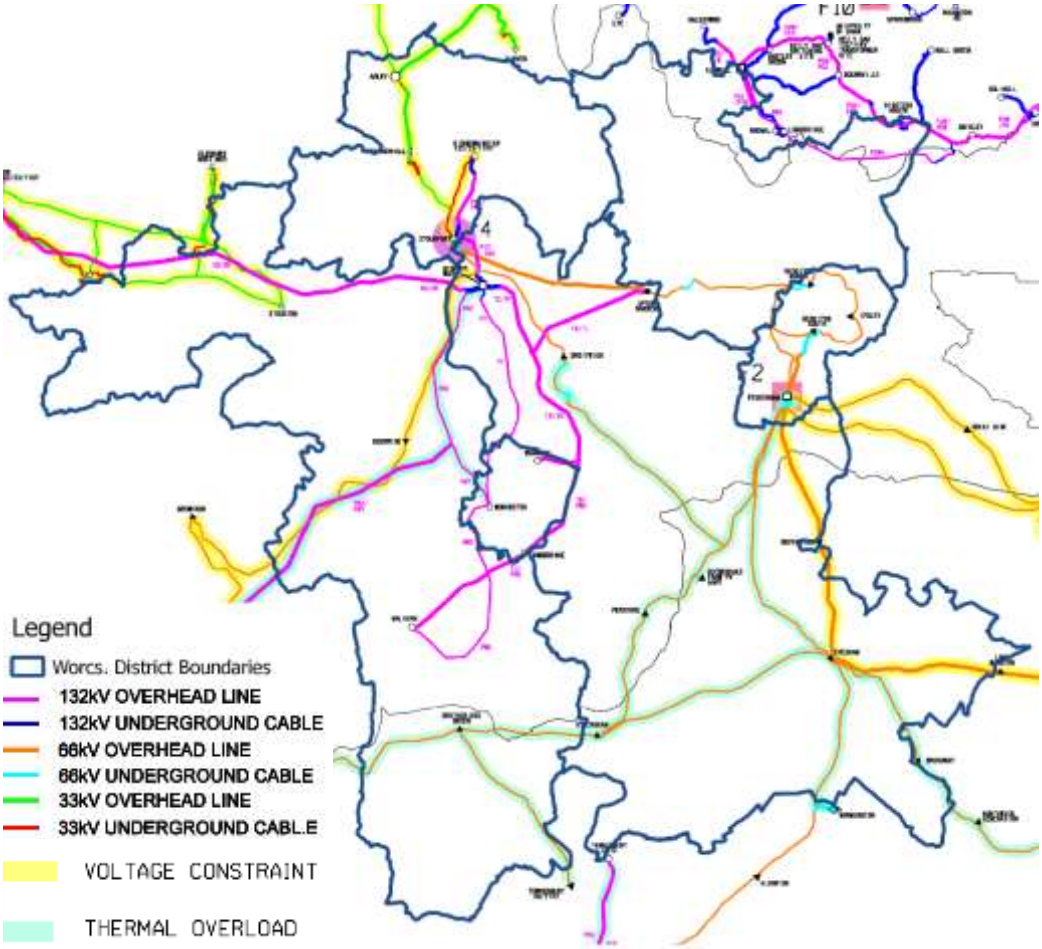

Figure 18: West Midlands distributed generation constraint map

High current flows on the network can lead to the temperatures of the cables exceeding the maximum permitted temperatures. If too much current flows through a line it may sag too close to the ground, or conductors and equipment may be damaged by overheating. This typically occurs in warm summer weather and when a large amount of solar PV is connected to the network. A number of 66 kV circuits are approaching their maximum thermal capacity, as a result of the increase of distributed generation.

The grid also needs to be operated to keep the voltages on lines within prescribed limits (+/-6% in 11kV and 33 kV networks). Distributed generation on the network can lead to

high voltages at times of peak generation, and this can be highlighted as a voltage constraint.

Beyond this the potential for connection of large scale demand and generation has been reviewed. The 33kV and 132kV substations within each region have been colour coded according to how feasible it is to connect additional generation to them, with green meaning feasible, amber less feasible and red constrained. Substations coloured grey had no data available to indicate capacity availability. The blue lines in show the local authority boundaries of Worcestershire. Grid Supply Points (GSPs) are locations where the Worcestershire electricity network connects with National Grid's Transmission Network, Bulk Supply Points are a tier down from this, with Primary substations making up most of the substations reviewed which transform voltage down 11kV and connect with the local 11kV network.

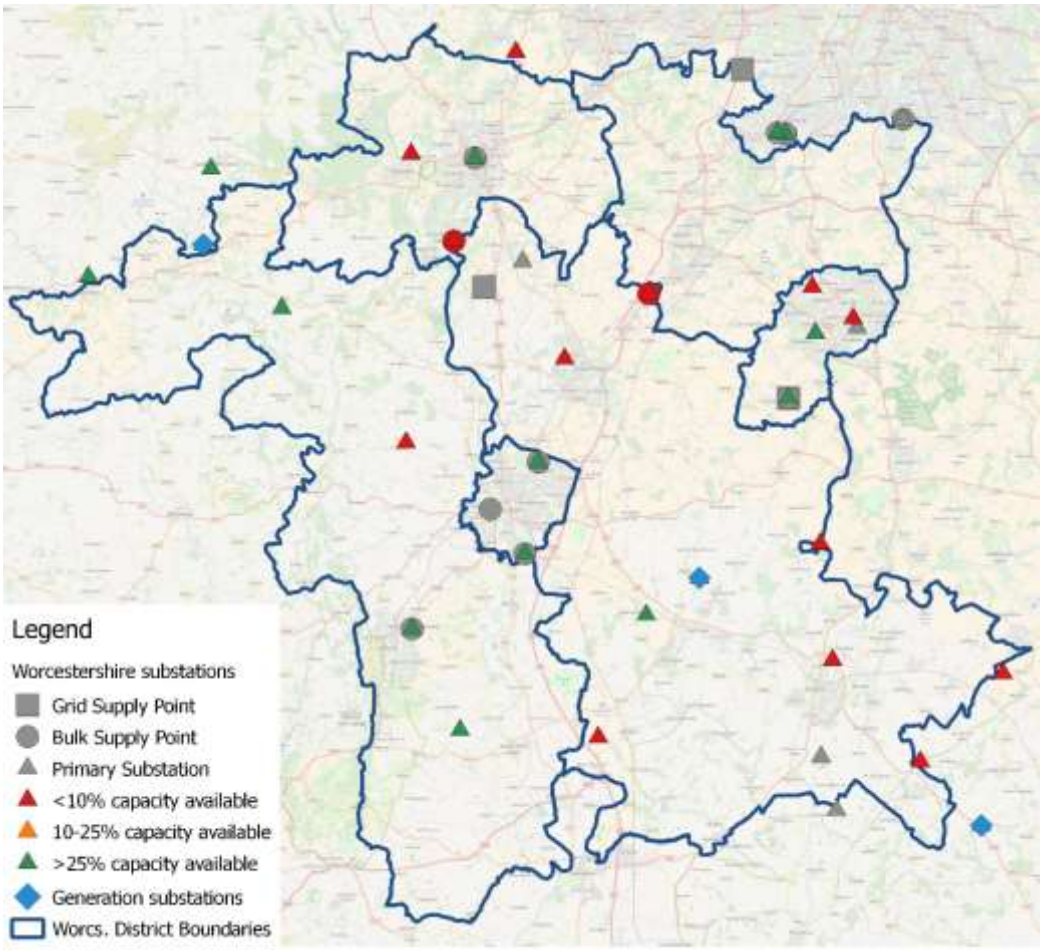

Figure 19: Worcestershire substation grid capacity review - generation headroom (16)

This analysis shows that within the southeast of Wychavon District there are a number of substations which are highly constrained, indicating less than 10% of reverse power capability is available and it will be difficult to connect further generation. These areas typically correlate with the areas in which we have seen the most significant large scale generation in previous sections. The substations highlighted in blue indicate sites which have been set up specifically to serve a local generation installation. Grey substations are those for which the Western Power dataset did not include any information.

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Wychavon as a whole has high energy demand and significant grid constraints based on existing capacity. Existing planned growth in Worcestershire and additional housing growth to meet demand from other surrounding areas will add further pressures.

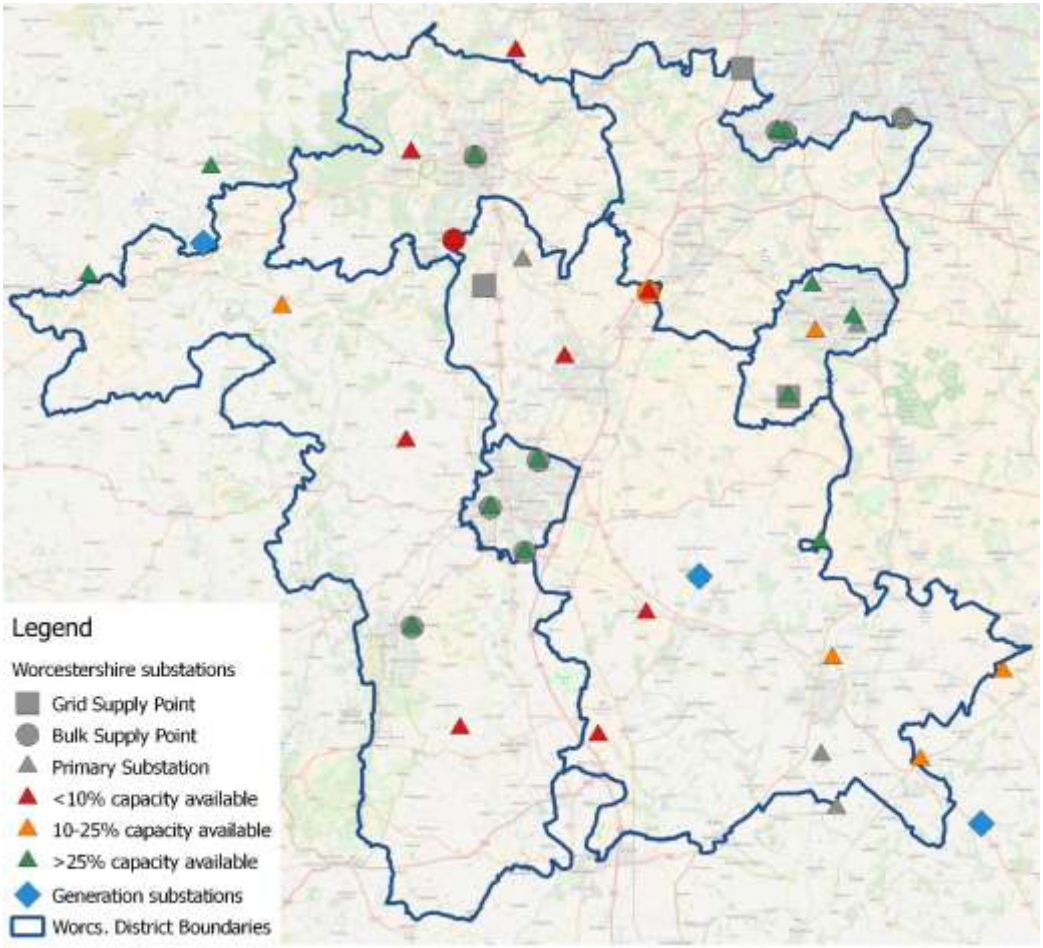

Figure 20: Worcestershire substation grid capacity review, demand headroom (16)

Demand capacity is less constrained than generation capacity in Worcestershire, however there are still some key areas of constraint, in particular in the south of Worcestershire, and around the Pershore and Evesham areas which are part of single local mesh network which means that constraints at one substation can affect all sites in a local area.

In the context of planned infrastructure development, some of these areas of constraint pose more of an issue than others. While the above maps show the proportion of capacity available by substation, this is not always a clear guide to how easy it is to site new large scale generation. Figure 21 shows the substations with a similar colour scheme but categorised according to the ability of each to connect a new large-scale housing development of 10,000 homes. This would typically have a maximum demand of 20 MVA, and so only sites with at least this much spare capacity have been highlighted in green. This map demonstrates that despite the apparent availability of new demand connections in Figure 20, when it comes to very significant loads and new developments there can be more constraints in place.

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Every substation marked amber or red on the map in Figure 21 would require reinforcement to connect a load of this scale. This does not prohibit new development, but can add additional cost.

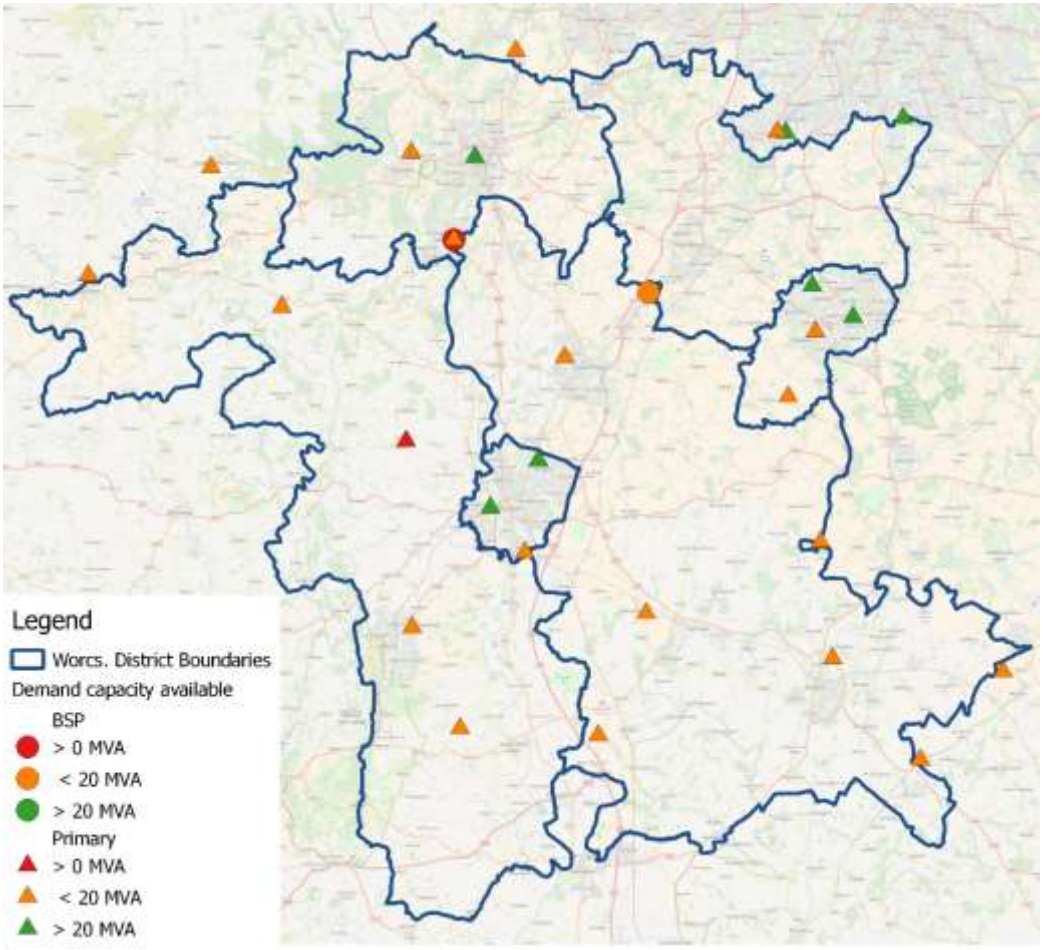

Figure 21: Quantified demand capacity available by substation (MVA) (16)

5.2 Electric vehicle charging

One important area to explore is availability of electric vehicle charge points, as a lack of availability of these is likely to put consumers off electric vehicle ownership. The geographical spread of these is important, as is the power of the charger. The larger the power output of the chargers the faster cars will charge and the shorter the waiting time for customers. However, the power of the chargers that it is possible to install is limited by the locally available grid capacity.

Electric vehicle chargepoint data comes from the National Chargepoint Registry and data provided by ZapMap. These are all charge points that can be accessed by the public, although some include restrictions. Domestic charge points installed by consumers at home are not included in this map. Electric vehicles can be charged from a domestic plug socket at up to 3kW, while a specially installed domestic charge point can charge the car at up to 7kW.

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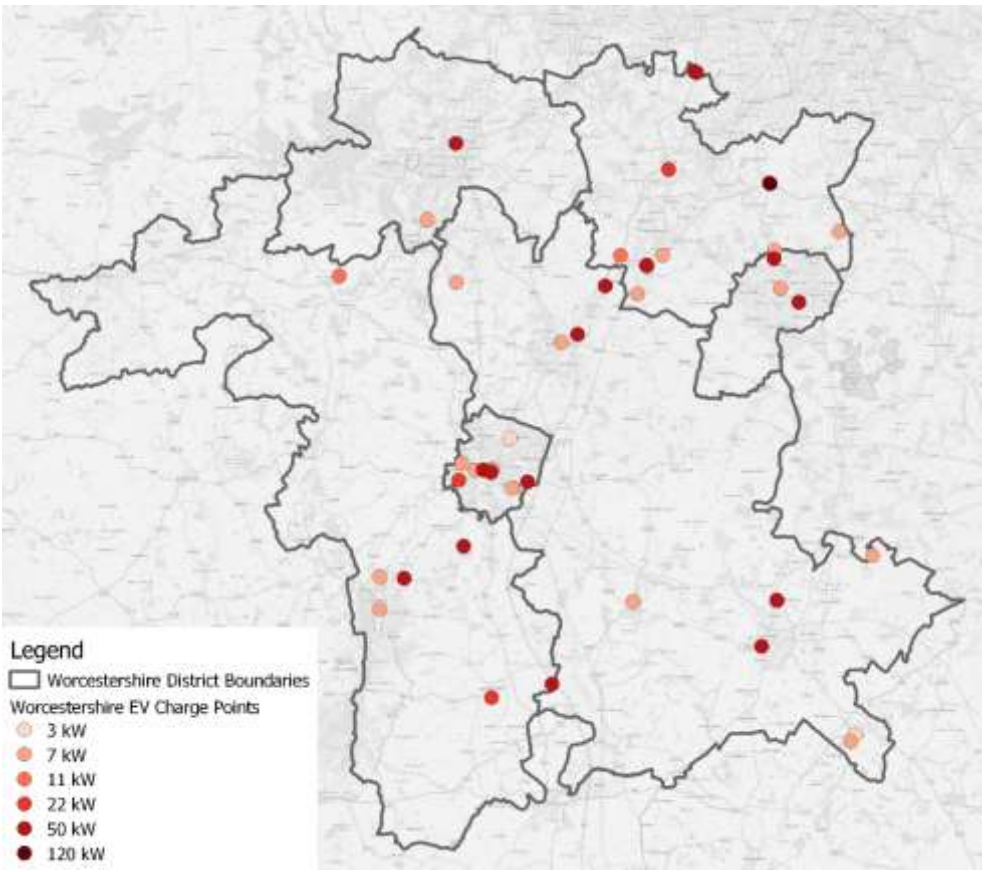

Figure 22: Electric vehicle charge point locations (17) (18)

Figure 22 shows charge points across Worcestershire. There are 71 charge points in 30 different locations. At each of the locations on the map there can be multiple chargers per site, although not all of them will necessarily be the same capacity as the one denoted by the colour of the dot on the map, for example at some of the Worcestershire county council sites two of the three charging points are 50kW while a third is 43kW. The colour of the dot denotes the highest capacity charge point available at the location.

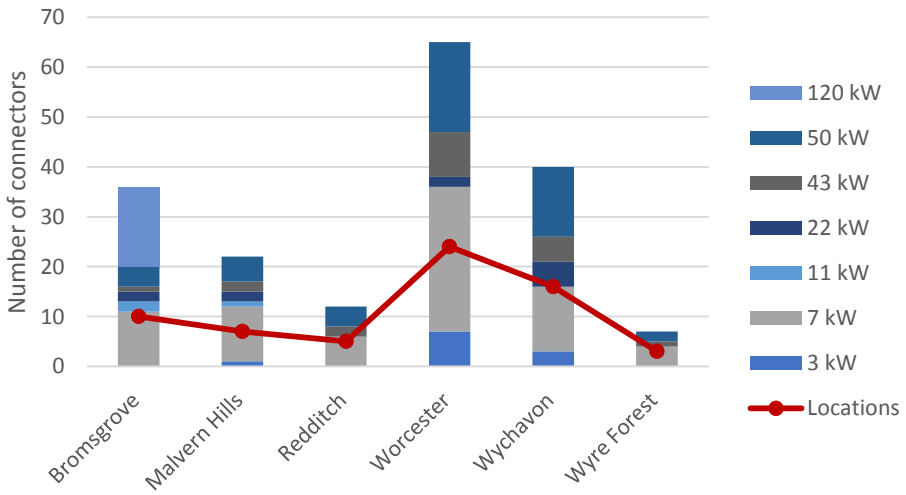

Figure 23: Number of EV charge point connectors by local authority area (18)

Figure 23 shows the breakdown of charging point numbers by local authority area. This refers to total available charging points not charging locations. The number of charging points is greater than the number of locations as many locations have more than one available charger. The highest number of charging points is observed in Worcester and Wychavon. The red line represents the total number of charging locations by local authority area. The charge points with the highest capacity are 120kW Tesla charge points, there are sixteen of these at Hopwood Park Services in Bromsgrove, and a further installation planned by Tesla in Worcester.

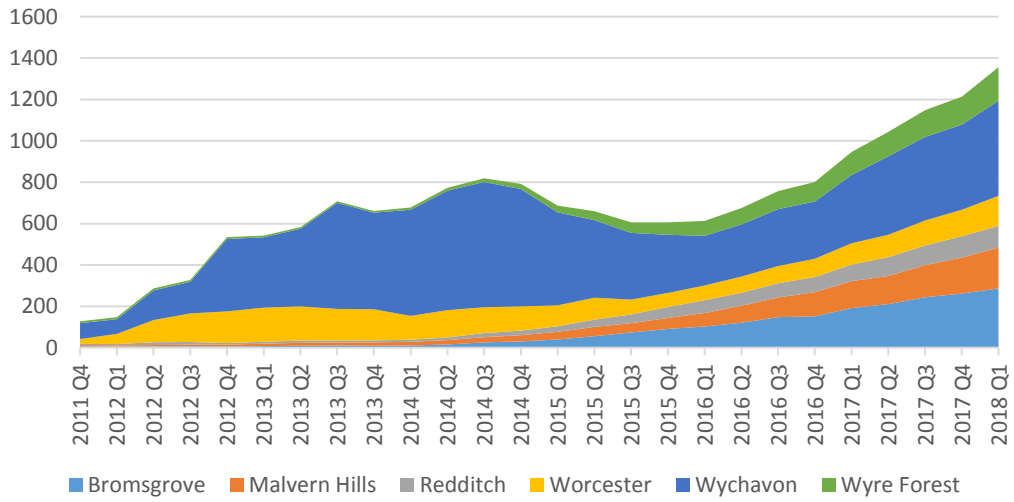

Figure 24: Licensed vehicles by local authority of registered keeper (19)

In Figure 24 it can be seen that between 2011 and 2014 there was significant growth in numbers of electric vehicles registered in Wychavon in particular, which subsequently declined. Electric vehicle take-up began rising noticeably in all other local authority areas from early 2015, and started rising in Wychavon from a low point in early 2016. The trend since January 2016 is clear, with EV ownership increasing in all local authority areas. Between December 2015 and December 2016 EV ownership grew 32%, and from December 2016 to December 2017 grew a further 51%, indicating the rapid growth that the electric vehicle sector is currently experiencing. This information is based on the location of the registered keeper and not necessarily the location of the vehicle, so can be skewed by business registration of low emission vehicles but should still provide a reasonable guide to the numbers of electric vehicles in the county.

The proportion of Ultra Low Emission Vehicles (ULEV) compared with overall registered vehicles in Worcestershire is 0.29%, with district figures varying from 0.20% in Redditch, Worcester and Wyre Forest, 0.30% in Malvern Forest and 0.38% in Bromsgrove and Wychavon. The mean UK proportion of ULEV vehicles is 0.37%, while the median figure for local authorities across the UK is 0.23%, with the highest figure in the City of London at 4.69%. Average ULEV take-up across the West Midlands as a whole is 0.53%, this is primarily driven by high take-up of EVs in Birmingham of 1.53%. Worcestershire ranks 3rd on this measure out of the 8 upper tier and unitary authorities in within the West Midlands, behind the West Midlands Metropolitan County (0.83% and Warwickshire (0.31%).

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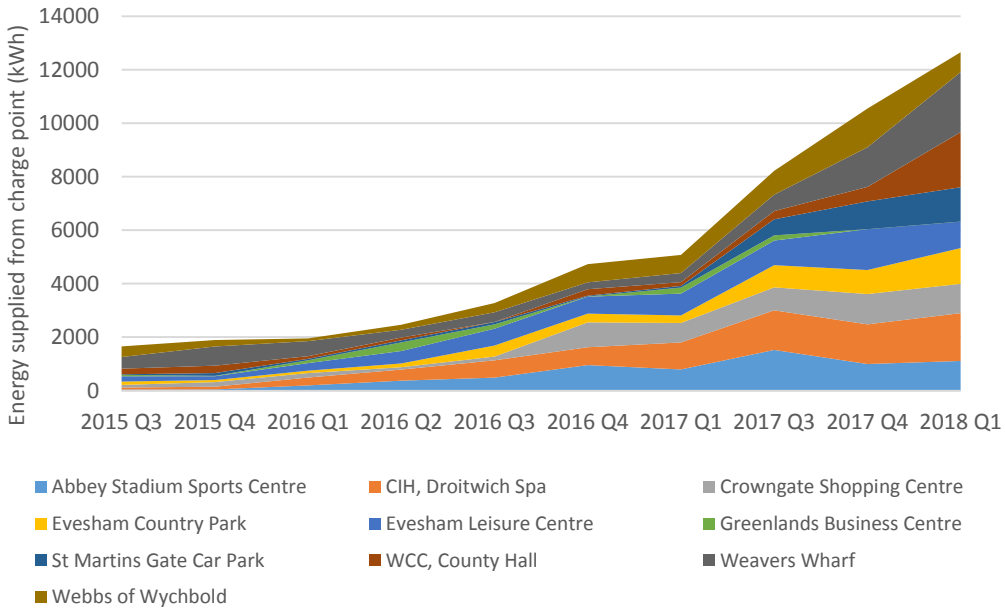

Figure 25: WCC owned charge point usage

Data for the usage of Worcestershire County Council owned charge points has been analysed, shown in Figure 25 above. From this it can be seen that the energy supplied by each charge point in kWh has been typically rising for each location, as the number of electric vehicles in the county grows. The energy delivered per charge averages between 9 and 12 kWh for each location, approximately 25-40% of battery capacity.

It can be concluded that current charging provision for electric vehicles is adequate, with fast charging provision typically sited at motorway service stations catering to through travellers in Worcestershire, while there are also a range of charge points available at destination charging locations and on other arterial routes within the county. Rural areas, however, are not well served with charging point infrastructure, which may present a barrier to the uptake of electric vehicles in more remote areas, minimising the attractiveness of electric vehicles to consumers within these areas.

Energy Performance of Buildings Directive

The revised EU Energy Performance of Buildings Directive (EPBD) of 2018 includes amendments to factor in provision for electric vehicle charging infrastructure. The new rulings state that all new and thoroughly renovated residential buildings with more than ten parking spaces must be equipped with the appropriate pre-wiring for a charging point to be installed in each space. The same rule applies to commercial buildings; only the requirement is for just 20% of spaces to be pre-wired. There will also need to be at least one physical charging point present in these car-parks, however residential properties will only need pre-wiring present.

EU countries have to transpose the new elements of the Directive into national law within 20 months. If a Withdrawal Agreement for the UK's exit from the European Union is subsequently formally agreed with at least a transition period to end 2020, the implementation date of the EPBD should fall within the relevant period and therefore the UK should implement the requirements into domestic law.

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6. Energy efficiency

6.1 Domestic energy efficiency

There have been a number of studies looking to quantify the state of the Worcestershire housing stock. The most comprehensive is the 2012 study looking at potential use of Green Deal measures. (20) Some key outputs are set out below.

Table 4: Housing stock profile for Worcestershire showing split of tenure

District	Owner Occupied	Social Housing	Private Rented	Total
Total	**184,695**	**37,443**	**21,672**	**243,809**
Bromsgrove	32,364	4,197	2,385	38,946
Malvern Hills	25,221	4,933	3,673	33,827
Redditch	24,344	7,481	2,200	34,025
Worcester	31,143	6,719	4,923	42,785
Wychavon	38,623	7,616	4,424	50,663
Wyre Forest	33,000	6,498	4,065	43,563

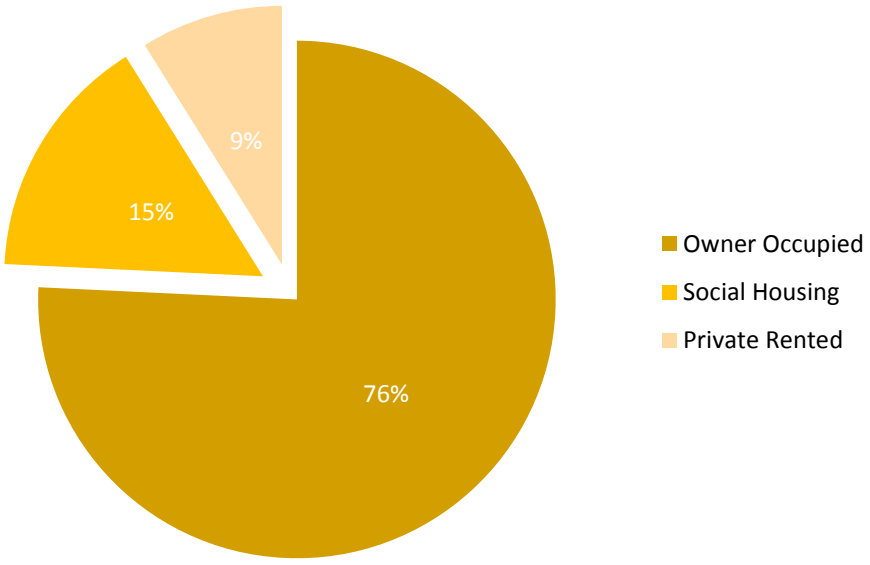

Figure 26: Domestic property stock by housing tenure

Tenure of stock does not vary hugely between the different local authority areas. Bromsgrove has the highest proportion of owner occupied stock at 83%, and correspondingly the lowest proportions of social housing and private rented stock. All other districts had a proportion of owner occupied stock of between 72 and 76%, in line with the average. Redditch had the highest proportion of social housing stock at 22%, with all others bar Bromsgrove at between 15 and 16%. There are greater proportions of flats and terraces in the more urban districts, with Wychavon and Malvern Hills having the greatest proportions of detached properties.

Table 5: Housing stock for Worcestershire by property typology

District	Detached	Semi-detached	Terrace	Flat, maisonette or apartment	Caravan or other mobile structure
Bromsgrove	37.5%	38.0%	14.4%	9.0%	1.0%
Malvern Hills	44.1%	30.7%	11.7%	12.6%	0.9%
Redditch	29.1%	30.7%	26.9%	13.1%	0.1%
Worcester	23.5%	35.2%	24.6%	16.5%	0.2%
Wychavon	41.6%	29.9%	17.5%	9.9%	1.1%
Wyre Forest	30.7%	38.5%	19.0%	10.8%	1.0%
Total	**34.4%**	**33.9%**	**19.0%**	**11.9%**	**0.7%**

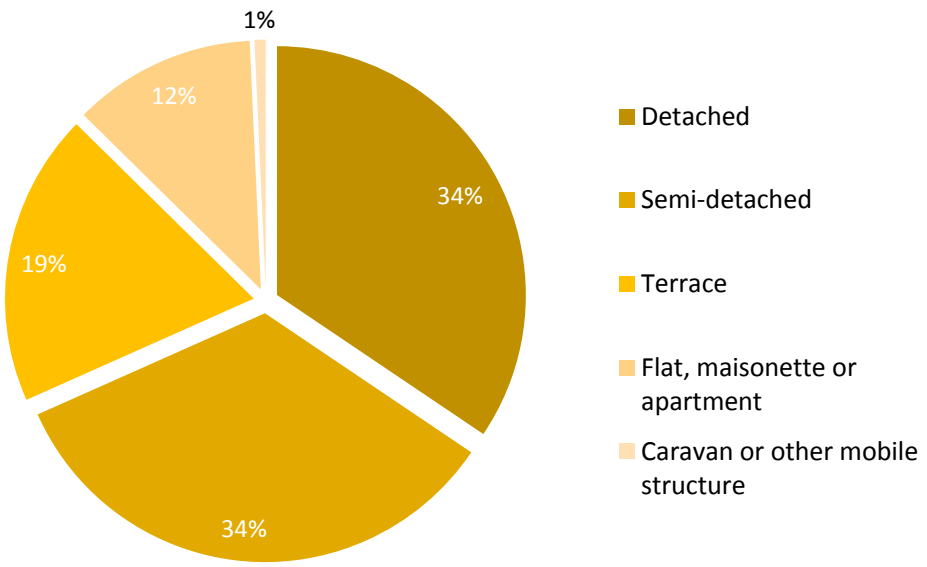

Figure 27: Housing stock by property typology

Table 6: Housing stock by main heating fuel

District	Gas	Oil	LPG	Coal	Electric	Biomass
Bromsgrove	87.7%	2.7%	1.0%	1.3%	7.0%	0.1%
Malvern Hills	62.2%	18.4%	4.6%	1.4%	12.9%	0.4%
Redditch	90.8%	0.4%	0.3%	1.7%	6.8%	0.0%
Worcester	85.5%	0.2%	0.1%	1.4%	12.9%	0.0%
Wychavon	70.0%	11.6%	4.3%	1.9%	12.0%	0.2%
Wyre Forest	84.5%	3.2%	1.3%	1.0%	9.9%	0.2%
Total	**80.0%**	**6.0%**	**2.0%**	**1.5%**	**10.4%**	**0.2%**

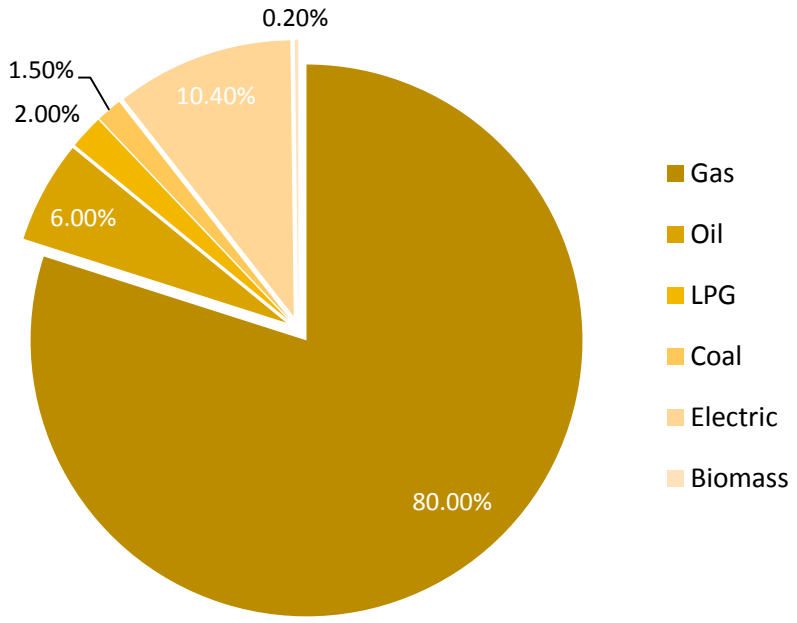

Figure 28: Housing stock by main heating fuel

Use of oil and LPG is particularly high in Malvern Hills and Wychavon, where use of mains gas is lower, due to less access to the network. There is still a not insignificant proportion of households using coal across all of the local authority areas.

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6.2 Fuel Poverty

Figure 29 shows the proportion of properties that are in fuel poverty for each of the LSOAs in Worcestershire. The areas with the highest proportion of fuel poor households are the more rural areas, also more likely to be off the gas grid, and the centre of urban areas including Worcester, Kidderminster and Redditch. The average fuel poverty for Worcestershire was estimated at 11.5%, lower than the West Midlands average (13.7%) (21). The Local Authorities with fuel poverty levels higher than the county average were Malvern Hills (12.6%), Worcester (12.7%) and Wyre Forest (12.5%).

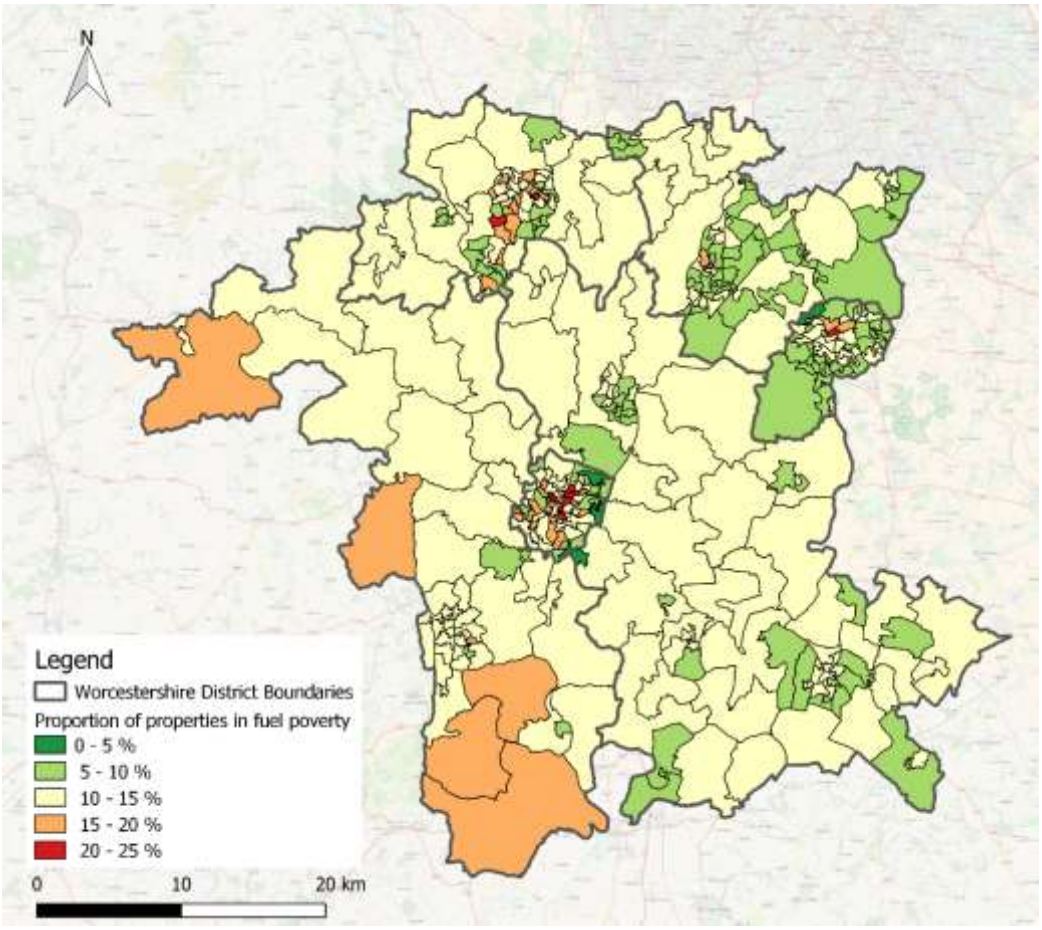

Figure 29: 2016 fuel poverty data - Low Income High Cost Indicator – by Lower Super Output Area (LSOA)

In the past, Worcestershire has encouraged the uptake of a number of different schemes to combat fuel poverty. The Warmer Worcestershire Network brings together the public sector and organisations to work towards improving health and wellbeing for the people through enhancing the efficiency of homes. The network identifies potential for home improvements, promotes schemes - such as the Energy Company Obligation (ECO) - and produces assessments and strategic directions for Worcestershire, to improve home energy efficiency and alleviate fuel poverty.

6.3 Off-gas grid properties

Figure 30 shows the percentage of off-gas properties within each Lower Super Output Area (LSOA). Off-gas properties are those that are not connected to the gas network. LSOAs represent divisions of England for census purposes based on population, and so

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represent smaller geographical zones within urban areas than within rural areas. By comparing the number of domestic gas meters within each LSOA with the number of households from the previous census, the proportion of households that are connected to the gas network and are therefore capable of using gas for domestic heating purposes can be estimated.

From Figure 30 it is observed that a high number of LSOAs within Worcestershire are characterised by a high percentage of off-gas grid properties (above 40% of properties), particularly in the more sparsely populated rural districts of Malvern Hills and Wychavon.

This lack of access to the gas network has major impacts for the heating fuels used, correlating with increased use of other more carbon emissions intensive fossil fuels such as oil or coal within rural homes. Changing the heating fuels in these homes is one of the government's key plans for decarbonisation of heat within the UK as set out in the Clean Growth Strategy (3).

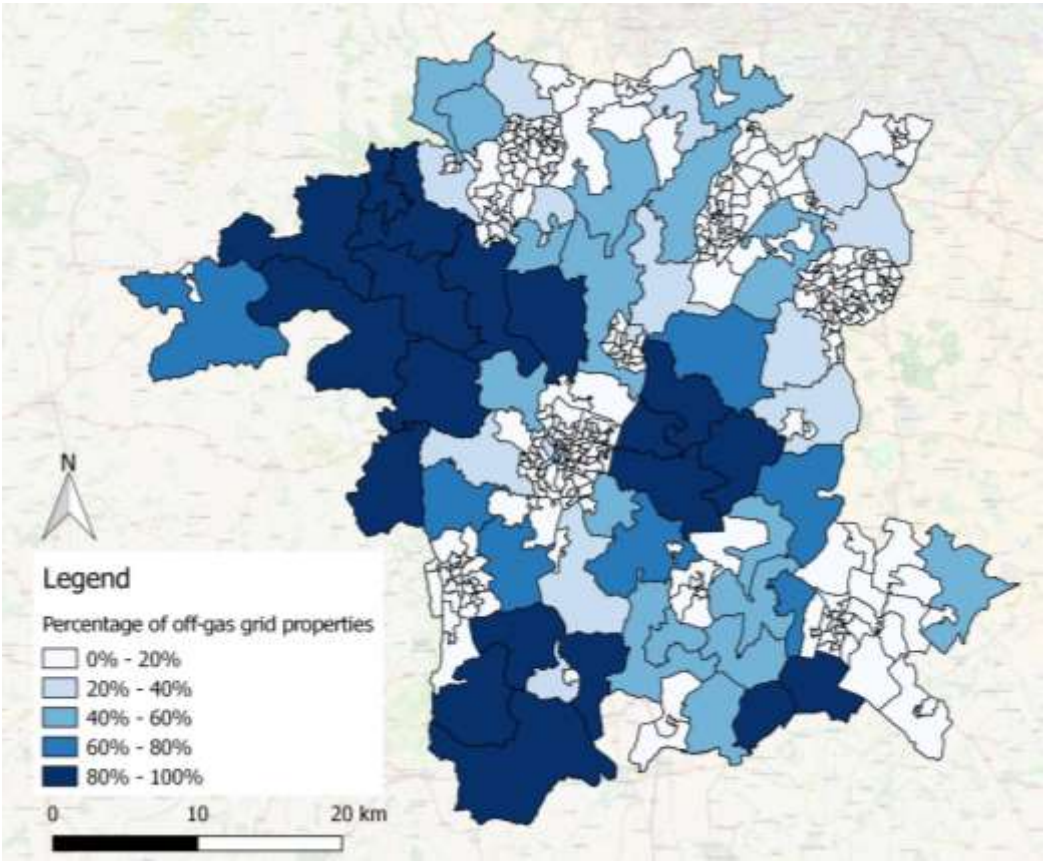

Figure 30: Percentage of off-gas properties by Lower Super Output Area (LSOA) (22)

7. The low carbon economy

7.1 Makeup of the low carbon economy

The low carbon sector is a key part of the future makeup of the Worcestershire economy. The definitions of the sector and how data is collected nationally have changed over time. Up to 2015 government collected data on the low carbon environmental goods and services (LCEGS) sector, since 2015 this dataset has been revised to encompass a smaller more focused area of the UK economy known as the low carbon and renewable energy (LCRE) economy.

In 2011/12, the most recent year for which data on a local authority basis is available for Worcestershire, the LCEGS sector in Worcestershire was made up of 411 companies employing 7,569 people with sales of £1,005m (23). This made up 0.81% of UK LCEGS employment. The 2016 national figures for the LCRE sector (24) indicate the UK had 208,000 full time equivalent employees in this area. Assuming the Worcestershire share of the LCRE economy is consistent with earlier LEP level data, this suggests that in 2016 the LCRE sector employed 1,676 people in Worcestershire.

The Innovas Consulting assessment of the Low Carbon Economy in the West Midlands identified areas of strength and weakness within the Worcestershire economy in 2013. (25)

Environmentally focused strengths include:

- Agriculture and horticulture – well developed supply chains
- Food and drink – 20% of GVA
- Well linked academic establishments for rural based environmental activities including food and drink
- Centre of excellence for horticulture
- Leading UK manufacturer of energy efficient boilers and renewable energy options including solar and ground/air source heat pumps
- nPower has major offices in Worcester
- Strong automotive supply chain
- Small number of companies (80) employing 50% of workforce – enables focus on maximum impact in small number of companies
- Good transport links
- Aligned partnerships
- Good support for LCEGS sector companies through Metnet, Worcestershire Business Central (Growth Hub) and a resource efficiency business support programme for local SMEs.

Areas of weakness include:

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- Low level of renewable energy deployment
- Limited academic and research support for areas such as renewable energies, low carbon vehicles, water supply, waste management, recycling or low carbon buildings
- No major utilities companies based in the area
- No power generation in the area.

Areas where progress is being made include:

- Deployment of flood defences
- Waste to energy facilities are increasing in capacity and power generation
- Development of support for LCEGS companies
- Resource efficiency business support programme for local SMEs.

Areas where more progress can be made include:

- Deployment of renewable energy facilities including geothermal
- Increased energy efficiency in buildings
- Increased fuel efficiency in public sector vehicle fleets.

Challenges/Opportunities include:

- Increasing population requiring more new houses and facilities
- Flooding risks requiring an increased level of flood defences
- Water availability for agriculture and horticulture
- Reducing energy/fuel costs for public sector
- Reducing energy /fuel for domestic and private sector
- Roll out of ECO3 programme.

7.2 Low carbon sector support

There are a number of initiatives being run in Worcestershire offering support to businesses in the low carbon sector or to other businesses to invest in low carbon technologies.

7.2.1 Low Carbon Opportunities Programme

In February 2017 Worcestershire County Council established the Low Carbon Opportunities Programme which runs until Sept 2019. It was brought forward in partnership between the county council, the district authorities and Herefordshire & Worcestershire Chamber of Commerce, and is funded by the European Regional Development Fund as part of the European Structural and Investment Funds Growth Programme 2014-2020.

The scheme offers free renewable energy or low carbon innovation assessments and grants to small and medium size enterprises (SMEs). Through the programme, SMEs in

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Worcestershire are enabled and encouraged to adopt renewable energy, with free feasibility support followed by grants of up to 45% of the capital cost of installing a renewable energy system.

Other SMEs can be helped to innovate and grow in, or diversify into, the low carbon sector. The scheme aims to help businesses working in the clean tech innovation sector or those who are developing low carbon solutions alongside their existing business activities. It provides expert support to help businesses to work out the next steps for their product, process or service development. Grants are then available for projects.

The programme also hosts events and forums to discuss low carbon innovation and renewable energy technologies which are available to all businesses as part of a low carbon innovator and renewable energy installer network.

7.2.2 Business Energy Efficiency Programme

The Business Energy Efficiency Programme (BEEP) is available to SMEs in Worcestershire, Herefordshire and Telford & Wrekin. BEEP is part funded by the European Regional Development Fund, and is administered by Worcestershire County Council, in partnership with Herefordshire Council, Telford & Wrekin Council, Worcestershire District Councils, Herefordshire & Worcestershire Chamber of Commerce and Shropshire Chamber of Commerce.

The programme offers free energy reviews and grants up to £20,000, with grants covering up to 40% of capital costs. An initial free energy efficiency assessment reviews equipment, premises, processes and performance to find opportunities for improvements in energy usage. Subsequently recommended measures are eligible for capital grants.

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