LCP Delta

Commissioned by the WMCA

West Midlands Combined Authority

Exploring the Market Dynamics and Value Chain of Smart Energy Systems: Cluster Activities in the West Midlands

Capitalising on opportunities for a smarter, more flexible energy system

MARCH 2025

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Executive Summary

Disclaimer: This report has been independently commissioned and prepared. The findings, interpretations, and conclusions expressed herein are those of the authors and do not necessarily reflect the views or policies of the West Midlands Combined Authority (WMCA).

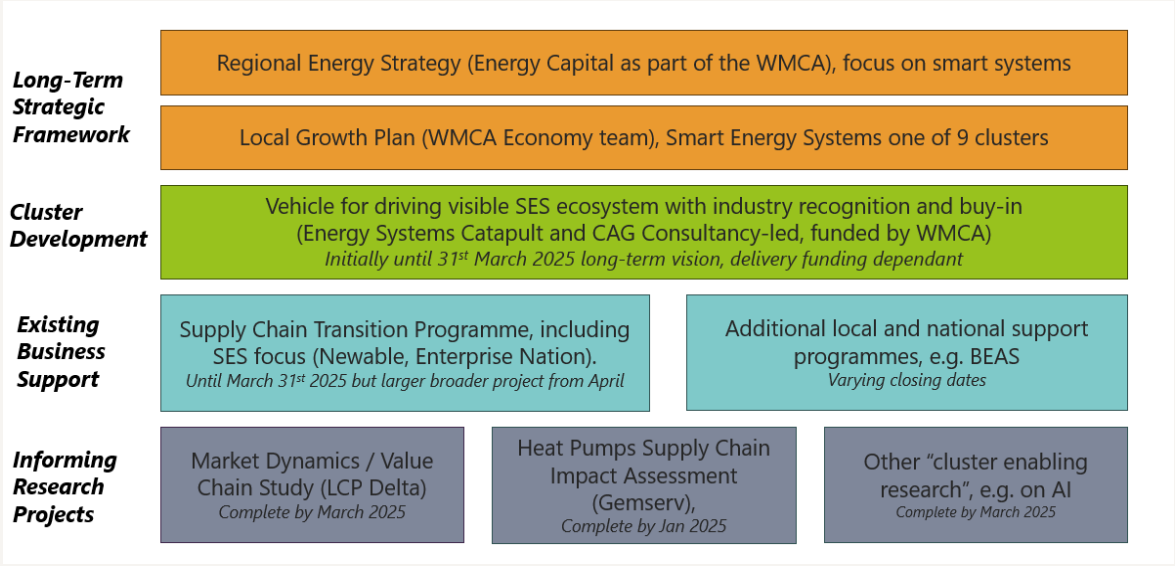
Executive Summary - Introduction

Background

The West Midlands Combined Authority (WMCA) has a vision to develop the West Midlands as the **strategic centre for the future of smart and flexible energy systems**. As part of the region's **existing economic strategy** (West Midlands Plan for Growth) and **emerging Local Growth Plan** (expected mid-2025), the WMCA is working to support the sustainable growth of a smart energy systems cluster, principally through the formalisation and co-ordination of **cluster activities**, working with industry to **reduce barriers and grasp opportunities**, such as by leveraging inward investment and driving business growth. Importantly, this will drive the **delivery of outcomes** outlined in the West Midlands **Regional Energy Strategy**, led by Energy Capital as part of the WMCA and released in February 2025.

This is an independent report commissioned by the WMCA which **aims to inform the future direction of the cluster delivery**. It is intended to deepen WMCA's understanding of segmented smart energy system markets, their potential, and where the West Midlands can specifically capitalise – including, where relevant, through interventions of WMCA and its partners.

West Midlands Smart Energy Systems Ecosystem*



*as of March 2025

Executive Summary - Opportunities in Three Broad Smart Systems

Smart System	Subsector	Definition and Integration into Smart Energy Systems	Potential Challenges of Integration	Revenue Potential
Smart Home Energy System	**Residential Solar** **Battery Storage** **EV Charging - Car**	Through the combination of the technologies that are involved for net zero homes; namely residential solar, battery storage, heat pump and EV charging, these can be harnessed under home energy management systems to provide maximum efficiency both for the homeowner and the network. The West Midlands has a number of companies in the region that can develop this system, ranging from sensors for energy monitoring, through to companies that can install the various technologies.	Ensuring the interoperability of both the different technologies and the technology brands to maximise customer experience will be vital. If successful, this can lead to a system that is effective both at the individual level and in the creation of virtual power plants.	**£254-390 million in 2030.** This is a combination of the three segments, with a range allowed for the residential solar revenue. The actual outcome could be higher than the sum of the parts, particularly once the addition of home energy management systems and the potential income from VPPs are factored in.
Smart Heat System	**District Heating** (incl Energy from Waste)	District heating networks, including those utilizing energy from waste, provide a centralised solution for low-carbon heat distribution across urban areas. These systems harness heat from sources such as waste-to-energy plants, industrial processes, and combined heat and power (CHP) plants, distributing it through an insulated pipe network to homes, commercial buildings, and public facilities.	Roll-out of district heating faces challenges related to infrastructure investment, regulatory alignment, and public-private collaboration. Upfront capital costs for network installation can be high, requiring long-term commitment.	**£186 million in 2030.** This assessment includes energy from waste. Growth of the sector is likely to be driven by high urbanization rate and the Heat Network Zoning regulation framework.
Smart Business Energy System	**Building Energy Management** **EV Charging Truck** **Solar C&I**	In a similar way to the development of the smart home energy system, through combining the technologies involved in greening businesses, a smart business system can be developed. As detailed on page 11, the technologies that enable building energy management, EV charging for trucks and solar C&I, can be used across the vast majority of subsectors within commercial, industrial and infrastructural businesses. (Although not detailed in this report, there is also the potential for battery storage within businesses to be paired with the solar assets.) When combined with the strong number of developers in the region, this sector has great potential both for revenues and creating smart, efficient energy usage by businesses.	The breadth of user base is both an opportunity and a challenge and the co-ordination of the opportunities will be key to the success. The successful persuasion of the different businesses that will need to co-ordinate for the most effective smart business energy system needs to be strategically planned. E.g. where the best location for the truck charging facilities is.	**£234-245 million in 2030.** This is a combination of the three segments, with a range allowed for solar C&I. It is also worth highlighting that the truck revenues are likely to still be low in 2030 and the figure should be expected to grow strongly beyond 2030 as that sector gains traction. As with the home system, the potential for cross-revenues across the various sectors involved could also lead to a higher figure than the sum of the parts stated here.

Executive Summary – Methodology

Defining the Opportunities within Smart Energy Systems:

The initial research defined the segments of the smart energy systems sector, namely energy management, clean tech, strategic services and supporting infrastructure.

To ascertain the opportunities that these may provide for the WMCA, the developers and the users of each segment were defined, which resulted in a number of subcategories and the identification of companies operating within these.

Assessing the Opportunities:

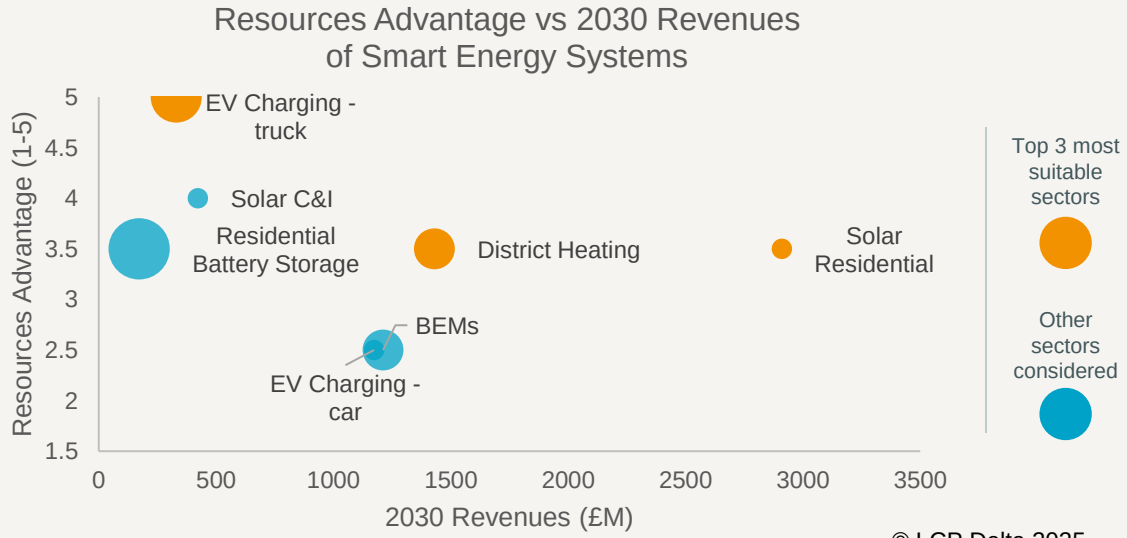
Seven distinct opportunities within smart energy systems have been assessed using the following scoring framework:

- Sizing the opportunity using LCP Delta forecasts for the UK.
- Resource advantages of the WMCA region, including analysis of the existing developers and users and their potential for growing the market.
- Competitive analysis to assess the defendable nature of WMCA's advantages, using Porter's 5 forces.
- A relative comparison of the potential for easing pressure on the grid and the reduction of local emissions.

The Results:

Through the assessment outlined, the report concludes that there are three segments of smart energy systems that the WMCA has significant potential to develop and achieve the targeted strong growth, especially when these are integrated into the smart energy systems, as detailed on page 5 above:

- **EV charging for trucks** – a nascent sector where WMCA has significant advantages and can help to shape the market as it develops, with a leading developer and significant numbers of potential users.
- **District heating** – the companies present in the region provide a high number of developers, with its urban density providing many users, making it well suited to succeed in this sector.
- **Residential solar** – given the number of developers in this sector within the WMCA and the scope to reach a significant proportion of the UK market users from the WMCA, there is reason to expect the WMCA can become a market leader in this sector.



Top Three Opportunities & Detailed Recommendations

The research has uncovered three subsectors that have significant potential within the region. Here we detail a selection of recommendations that can help to capture the opportunity in each of the segments. However, as summarised on page 5, each of the three come from different areas of smart energy systems: **residential, heating and business**.

In this regard, the **major recommendation** across all three is that they should be incorporated into the system categories that are outlined on page 5. **Through setting up steering groups as part of the SES cluster's roadmap to focus on each of the residential, heating and business systems**, this can enable the strategic planning and collaboration required to bring together the developers and the users in each of the systems. This will ensure not only that the revenues are maximised but that the development of the smart systems they sit within is also optimised.

Residential Solar

- The energy retail companies are making progress in detailing the benefits of solar panels to their customers but given the uptake is still below 10%, it seems likely that further customer education is needed. **By partnering with energy retail companies, the WMCA can increase the demand from customers.**
- Given the significant proportion of the UK population that is within commuting distance of the WMCA, the above demand side action needs to be met with the workforce able to install the customer demand. **Supporting businesses involved with the installation** could be beneficial to maximising the revenues that the WMCA region can achieve.
- Research has found that EV drivers are 7x more likely to have solar on their roof. It could be beneficial to **partner with an EV charging company to encourage solar installation**. (Adding the benefit of developing a relationship with EV charger companies and potentially resulting in them opening a facility in the WMCA.)

District Heating

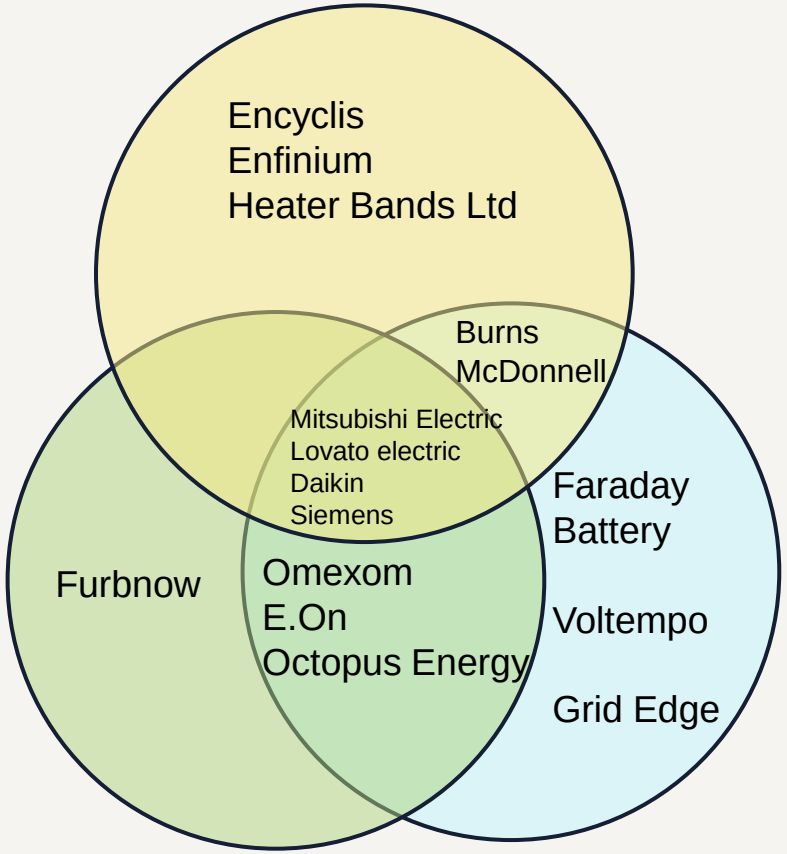
- **Develop a standardised procurement framework to promote local manufacturing and supply chains.** The WMCA could bring multiple local authorities together to agree on shared procurement principles and timelines for heat network projects.
- **Establish a WMCA-led investment fund or guarantee scheme to de-risk early-stage heat network projects.** The heat network market is still emerging and lacks the established track record that conservative investors typically seek. By providing financial support or guarantees, the WMCA could attract more private investment, accelerating the growth of heat networks in the region.
- **Create a centralised coordination body within the WMCA to support stakeholder alignment.** Heat network projects involve many stakeholders with potentially competing interests, making coordination complex. A “one-stop shop” within the WMCA could act as a neutral convener, ensuring smooth collaboration across local authorities, investors, suppliers, and end users.

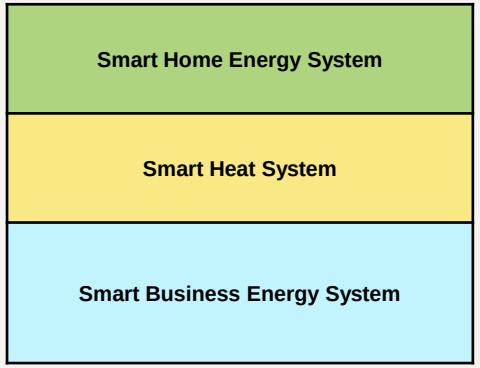
EV Charging – Trucks

- One of the most important requirements for a successful charging station for trucks is the land needed for it. As detailed, the installation costs can vary significantly and **by securing the most attractive locations in the region, the WMCA can enable the successful growth of the market**. This could be further developed to become a hub for larger transport vehicles in general such as coaches.
- Voltempo has a growing reputation within the sector, as evidenced by the eFREIGHT 2030 consortium. **With the Logistics and Distribution cluster** formed by WMCA, there is the potential to **build a strategy with Voltempo** to ensure the success of the opportunity.
- As LCP Delta’s truck expert details; “35 BETs charging overnight could easily require an additional 1MW of power; this will be much higher for HPC charging.” This will require **working with the DNO and TSO to ensure the capacity is in sync with the likely rollout of the truck charging points.**

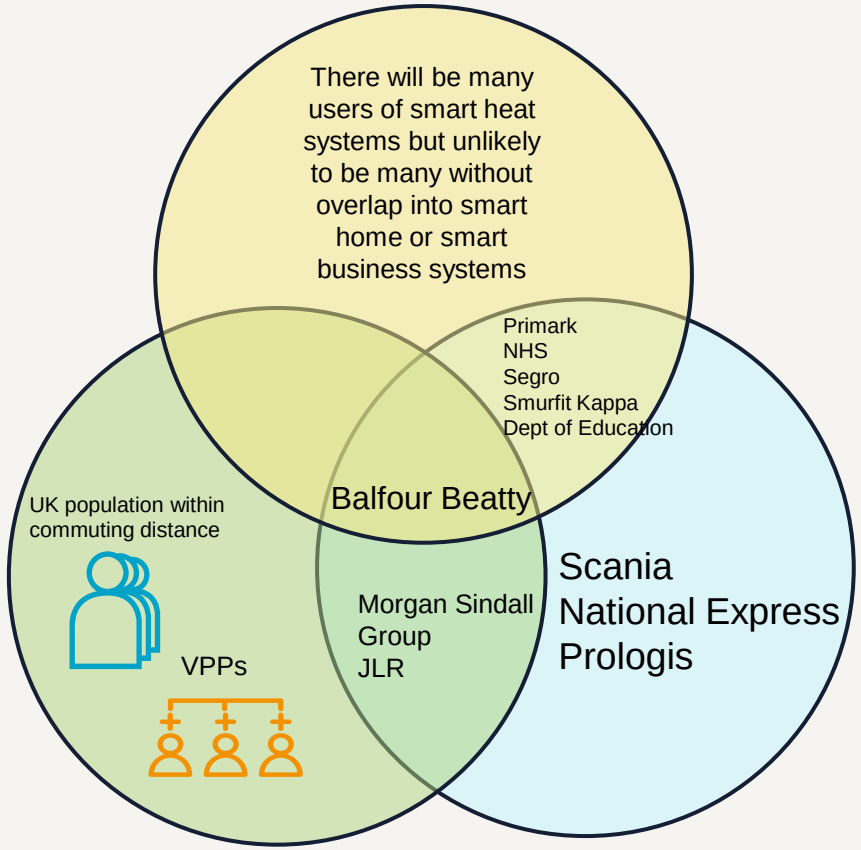
A Selection of the Developers & Users of the Smart Systems

Developers of the Market*





Users of the Market*



* Only a selection is provided in the diagram. More developers and users exist within the region.

Integration to Maximise Developers Revenues and Optimise Users Experience

Smart Home Systems

Companies operating within the smart home systems could **combine to provide attractive bundles to the consumers**; bundles have been shown to increase the demand from the consumer due to the ease it adds to the experience. With the many elements involved in a net zero home; solar PV, EV charger, battery, energy management, pricing tariffs; making the installation as easy as possible for the consumer is key. There are a **number of companies within the region (or just outside in the case of Indra) that can be part of this type of bundle**, leading to increased revenues for those companies, be they manufacturers, installers or ongoing providers of the services.

- Daikin
- Mitsubishi Electric
- Indra
- Furbnow

Smart Heat Systems

Heat networks involve a comprehensive chain of activities, including feasibility studies, infrastructure design and installation, energy production and distribution, maintenance, and ongoing operations. A locally formed consortium can be particularly well-positioned to secure heat network projects under procurement processes that prioritize strong local content or that concern smaller-scale developments.

While certain project components, such as specialized hardware, may not originate in the West Midlands, there are a **number of businesses within the region that could form a consortium** and are capable of collaborating to deliver local goods and services.

- Enfinium
- Encyclis
- Arup
- E.ON
- Ramboll

Smart Business Systems

The smart energy solutions that are available to businesses within the region are significant. Ranging from **building energy management, to solar PV and battery, and for larger businesses, the installation of EV chargers**, both for trucks and their light fleets.

There are a **number of businesses within the region that could form a consortium** to provide a suite of solutions for businesses, ranging from the equipment needed, to the sensors for assessing energy usage, to the installation and operating of the assets. The co-ordination of these offerings will **increase the revenues of the companies** involved and also make the experience as straightforward as possible for the businesses installing the smart business systems, which will also make their **businesses more efficient and profitable** as well. A further benefit for the region.

- Voltempo
- Lovato Electric
- Equans
- Grid Edge
- Burns McDonnell
- Omexom
- Mitsubishi Electric

N.B. The companies detailed in these bundles are only illustrations and should not be seen as a statement that those companies included are superior to others in the region that have not been included.

The Developers of the Smart System Opportunities

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		Energy Management			Clean Tech			Strategic Services		Supporting Infrastructural
		Software & Service	Installers & Operators	Hardware	Manufacturing	Batteries & EV	Installers & Operators	Consulting	Services	iDNOs/Smart Retailers
Smart Home	Residential Solar	✓	✓✓	✓	✓		✓✓	✓	✓	✓✓
Smart Home	Residential Battery Storage	✓	✓✓	✓	✓✓	✓	✓✓	✓	✓	✓
Smart Home	EV Charging - Car		✓✓			✓	✓✓	✓	✓	✓✓
Smart Heat	District Heating (incl Energy from Waste)		✓✓	✓	✓		✓✓	✓✓	✓✓	
Smart Business	Building Energy Management	✓✓	✓✓	✓	✓	✓	✓✓	✓✓	✓✓	
Smart Business	EV Charging Truck		✓	✓✓	✓✓	✓	✓	✓✓	✓✓	✓
Smart Business	Solar C&I	✓	✓✓	✓	✓		✓✓	✓✓	✓✓	✓

✓ Denotes that there is an existing company(s) that can develop the opportunity in the region.

✓✓ Denotes strong potential based on our assessment at the sector level

The Users of the Smart System Opportunities

LCP Delta

		Industrial					Commercial					Residential	Infrastructural		
		Advanced Manufacturing	Construction	Low Carbon & Environment tech	Life sciences & healthcare	Logistics & Transport tech	Business & Professional Services	Creative & Cultural	Retail	Tourism	Public Sector	Housing	Energy	Transport	Digital
Smart Home	Residential Solar									✓		✓	✓	✓	
Smart Home	Residential Battery Storage									✓		✓	✓	✓	
Smart Home	EV Charging - Car	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Smart Heat	District Heating (incl Energy from Waste)	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Smart Business	Building Energy Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Smart Business	EV Charging Truck	✓	✓	✓	✓	✓			✓		✓		✓	✓	✓
Smart Business	Solar C&I	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	

✓ Denotes that there is an existing user(s) that can develop the opportunity in the region.

Appendices: Market Segmentation, Stakeholder Mapping & Scoring Framework

Developers of the smart energy market

A market segmentation was developed with WMCA to map out smart energy systems. The scope of the study was conducted at the sub-categories level.

Top level category	Top level definition	Sub-categories	Sub-definition	Example of area of net zero economy covered	RTIC * Category
Energy Management	Providers of technology and services to support the monitoring, control, measuring and conserving of energy performance and flexibility.	Software & service	Companies involved in data collection and analysis, implementation of data for energy efficiency	Digital twins, aggregators	CleanTech: Adapted Goods, Energy Management: Smart Grid, Systems, Smart Meter
		Fuels & energy storage	Companies involved in infrastructure for fuels & energy storage facilities, micro-grids. (Storage rather than production)	Battery storage (potential to focus on data centres & warehouses), hydrogen	Energy Management: Smart Grid, Systems, Smart Meter
		Installers & operators	Companies installing & operating equipment necessary for energy management	Flexibility provision, smart meters	Energy Management: Smart Grid, Systems, Smart Meter
		Hardware	Manufacturers of technology needed for energy management	Heat pumps, Solar PV, EV chargers, smart meters, sensors, heat networks	Electronics Manufacturing, Energy Management: Smart Grid, Systems, Smart Meter
Clean Tech	Innovative technologies to reduce environmental impact and driving smart energy usage.	Batteries & EV	Companies providing batteries, new battery technology / apps & EV charging. (Does not include the cars themselves)	Batteries and EV charging	CleanTech: Adapted Goods
		Fuels / energy from waste	Companies producing new fuels or energy from waste. (Storage rather than production as scope is downstream only.)	Hydrogen, energy from waste	Energy Generation: Bioenergy, Energy Generation: Nuclear (Small Modular Reactors), Modular Construction
		Manufacturing	Manufacturers of clean technology	Heat pumps, Solar PV, EV chargers, smart meters, sensors	Electronics Manufacturing, Modular Construction
		Renewables	Renewable energy sources	Solar and wind	Energy Generation: Solar, Offshore Wind, Onshore Wind
		Installation/operation/maintenance	Companies involved in installation and maintenance of clean tech	Energy management	Clean Tech: Adapted Goods, Energy Management
Strategic Services	Advisory services supporting the wider energy system through expertise and consultancy to achieve smart energy ambitions	Consultancy	Providing engineering, technical, policy, regulatory consulting services	Strategic direction for net zero economy	Energy Management
		Services	Technical, energy services and facilities management	Implementation of net zero strategy	Energy Management
Supporting Infrastructure	Companies that oversee and manage energy distribution networks as well as smart energy retailers	iDNOs / smart retailers	Companies responsible for operating and managing energy distribution networks and smart retail services.	Grid management, energy retail	Energy Management: Smart Grid, Systems, Smart Meter

RTIC: The Data City's Real-Time Industrial Classifications used to classify a company's activity
Real-Time Industry & Sector Data - RTICS - The Data City

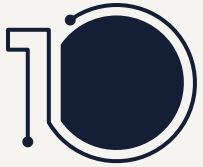
Smart Energy Systems Company Landscape in the West Midlands

This table maps the smart energy system landscape in the West Midlands, highlighting market developers (companies listed in the rows) and market users (represented by the column headers)*.

	Infrastructure	Industrial	Commercial	Residential
Energy management	Fuels and Energy Storage: Cadent, Ryze, Bryt Energy, Voltempo, Origin 21	Software & Service: Octopus Energy, Furbnow Installers & operators: E.ON, Lovato Electric Hardware: Schneider Electric, Jigsaw, Ecosmart, Mitsubishi Electric	Grid Edge, Elemental Power	Correla, Siemens
Clean tech	Fuels / Energy from waste: PryoGenesys, Micro:Cab, Wastewater Fuels	Manufacturing: Mitsubishi Electric, Heater Bands Ltd, Daikin Batteries & EV: Voltempo, Faraday Battery, Global Nano Network Installation/operation/maintenance: Omexom, Connect infrared		
Strategic services		Consultancy: Burns McDonnell, Baringa, Gemserv, Arup, wsp, Mott MacDonald, Jacobs, Atkins Services: Equans, Enzen		
Supporting Infrastructure	iDNOs / Smart retailers: Octopus Energy, Eclipse Power			

*illustrative diagram, not designed to be exhaustive

Each sector was scored on revenue potential, resource advantage in the West Midlands, and competitive moat that exists in the sector.



Revenue potential

This criterion evaluates the total addressable market (TAM) both today and in five years. It assumes that most demand will be national, focusing on the UK market as the primary driver of revenue potential.

Additionally, while products may be sold domestically, some sectors rely on imported goods for manufacturing. This distinction is important, as local value creation may be limited if production occurs abroad.

Scoring	Annual revenues in 2030
5	**> £2 billion**
4	**Between £1 billion and £2 billion**
3	**Between £500 million and £1 billion**
2	**Between £100 Million and £500 million**
1	**< £100 Million**

Resources advantage

This criterion assesses the natural advantages the West Midlands may have in specific smart energy systems.

These advantages are distinct and identifiable characteristics that benefit companies establishing a presence in the region.

Our study considers five key competitive advantages:

- **Research**: Strength of local innovation and academic expertise.
- **Infrastructure & Geography**: Availability of essential infrastructure and strategic location benefits.
- **Skilled Workforce**: Access to a specialised talent pool.
- **Market Presence**: Existing industry players and ecosystem strength.
- **Internal Demand**: Local market size and demand drivers.

Competitive Moat

This criterion evaluates industry competition, assessing the competitive intensity of a sector in the UK.

High competition and therefore lack of “protective moat” may reduce the West Midlands' strategic interest in the sector.

Competitive intensity is measured using Porter’s Five Forces:

- **Threat of New Entrants**: Easier market entry increases competition and reduces profitability.
- **Supplier Power**: Fewer suppliers with control over key inputs can raise costs and limit flexibility.
- **Buyer Power**: More customer choices put pressure on pricing and margins.
- **Threat of Substitutes**: Alternative solutions reduce demand and force differentiation.
- **Industry Rivalry**: More competitors drive price wars and market saturation.

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