Regional Energy Systems Operator Project

A place-based approach to power, heat and transport

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Agenda

• Introduction to Energy Capital
• The local and national context for our work
• Introduction to the RESO project
• Next steps
Who are Energy Capital?
Energy Capital is the policy and delivery body for energy in the West Midlands

- Responsible to the Mayor through the Energy Capital Board
- Public-private partnership
- Energy core to our local industrial strategy
- £8bn p.a. spent on energy services
- 50,000 jobs
- 4 million people
- 2 million homes
- 200,000 homes in energy poverty
- 215,000 new build
- ~21M t CO₂ p.a.
- Significant investment programmes
- Centre of UK energy industry
Powerful partnerships and innovation will be the heart of our success
What do Energy Capital do?

The Energy Capital partnership wants to demonstrate locally, regionally and nationally, that we can work effectively together in the West Midlands, to facilitate smart local energy systems, which will provide significant benefits for the businesses and citizens of the West Midlands, as well as the energy system as a whole.
National and Local Context

Why are we doing what we are doing?
Clear policy trajectory

The Clean Growth Strategy
Leading the way to a low carbon future

The Road to Zero
Next steps towards cleaner road transport and delivering our Industrial Strategy

West Midlands Local Industrial Strategy
May 2019

A Regional Energy Strategy for the West Midlands
November 2018
WMCA have declared a Climate Emergency

Zero carbon by 2041
(36% reduction by 2022, 69% reduction by 2027)

Constituent members have varying and sometimes tougher targets within this
- Birmingham 2030
- Coventry well-ahead of previous targets

We have a bigger challenge than most as the region is
- built on fossil fuels
- Relies on the automotive sector
- Historically an net energy importer
National pathway includes widespread electrification

No gas boilers in new housing from 2025
No ICE engines in cars from 2040
BUT our electrical infrastructure is becoming strained

There are areas within the West Midlands where we have already reached capacity

Electricity is not necessarily low carbon in itself, it requires low carbon generation
We need more renewable generation on our networks
## Renewable installations in WM

### Table 1: WPD’s July 2017 connections by technology in the West Midlands licence area

<table>
<thead>
<tr>
<th>Generator type</th>
<th>Connected [MVA]</th>
<th>Accepted-not-yet-connected [MVA]</th>
<th>Offered [MVA]</th>
<th>Total [MVA]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photovoltaic</td>
<td>591.4</td>
<td>282.4</td>
<td>22.1</td>
<td>895.9</td>
</tr>
<tr>
<td>Wind</td>
<td>48.1</td>
<td>4.0</td>
<td>4.0</td>
<td>56.1</td>
</tr>
<tr>
<td>Landfill gas, sewage gas, biogas and waste Incineration</td>
<td>202.0</td>
<td>64.0</td>
<td>5.6</td>
<td>271.5</td>
</tr>
<tr>
<td>CHP</td>
<td>13.8</td>
<td>32.8</td>
<td>303.0</td>
<td>349.5</td>
</tr>
<tr>
<td>Biomass and energy crops</td>
<td>32.9</td>
<td>16.5</td>
<td>-</td>
<td>49.3</td>
</tr>
<tr>
<td>Hydro, tidal and wave power</td>
<td>0.6</td>
<td>0.5</td>
<td>-</td>
<td>1.1</td>
</tr>
<tr>
<td>Storage</td>
<td>2.9</td>
<td>704.0</td>
<td>298.6</td>
<td>1,005.4</td>
</tr>
</tbody>
</table>

BUT we are also constrained on infrastructure to distribute low carbon generation.
Energy Innovation Zones
Prospering from the Energy Revolution (PFER)

Smart energy systems can intelligently link energy supply, storage and use, and power heating and transport in ways that dramatically improve efficiency. It's a huge market opportunity, with $2 trillion a year estimated to be invested in global energy infrastructure.

The government is enabling the UK to take advantage of this by funding industry and researchers to create new systems. They will provide cleaner, cheaper energy, while creating high value jobs for the UK.

Doing so will meet government’s priorities set out in the Clean Growth Strategy, the Smart Energy Systems and Flexibility Plan and Industrial Strategy’s clean growth pillar. It will help the UK to meet air quality targets at lower investment costs, avoid power cuts and ensure its compliance with the fifth carbon budget (from 2028).
PFER Funding

- £102.5 million under UKRI funding competition
- West Midlands secured investment of £5.5 million in three schemes
  - Zero Carbon Rugeley (Rugeley)
  - GreenSCIES (Sandwell)
  - Regional Energy Systems Operator (RESO) (Coventry)
Regional Energy Systems Operator Project

A place-based approach to power, heat and transport
RESO – What’s the big idea?
RESO – Key facets

Partners

Timescales  24 month project commencing 1st January 2020
Project deliverables

The project will deliver the following three main outputs:

1. A detailed smart local energy infrastructure design for the city of Coventry, specifying an energy infrastructure vision for the city suitable to meet future energy demands for power, heat and transport up to 2050.

2. An operating model for this design (i.e. a real-time city energy asset optimisation and management framework)

3. A business model which specifies the stable regional institutional and organisational framework necessary to secure and support the long-term investments required.
Project requirements

Our project must:

- Integrate new energy technologies across heat, power and transport in a way that is replicable and scalable to multiple areas across the UK
- Reduce the whole system costs of energy provision, resulting in significantly smaller bills for the end consumer (>25%)
- Consider the future role of gas as well as electricity systems
- Show we understand the impact that varied boundaries of local authorities, gas and electricity distribution networks, and mobile energy assets (such as vehicles) have on the national and local energy system
- Consider the policy and regulatory conditions needed to design the local energy system
- Consider how we will work with local authorities, the Department for Business, Energy and Industrial Strategy (BEIS), Ofgem and Code Administrators to implement our design
- Develop revolutionary market and business model approaches for the provision of smart energy systems
- Validate the revenue streams and value proposition of the proposed business model
- Write sound financing and investment proposals for the implementation of the energy system design which share the benefits and risks fairly between investors, consumers, utilities and authorities
- Show an integrated approach to managing energy supply, distribution and consumption across heat, power and transport
- Develop a detailed understanding of energy supply, distribution and consumption patterns in our locality
- Be based on a clear understanding of the current and future energy assets, networks and consumer needs in our locality
- Describe how we will aim for an open data and systems design policy wherever possible
In summary...

- Start of an exciting project in Coventry and other PFER areas
- Many challenges and barriers to overcome
- Strong political support for the project at all levels
- Could result in systematic change of how energy is generated, used and managed in our region
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