West Midlands Combined Authority

ENERGY CAPITAL

Regional Energy Systems Operator Project

A place-based approach to power, heat and transport

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West Midlands Combined Authority

Agenda

- Introduction to Energy Capital
- The local and national context for our work
- Introduction to the RESO project
- Next steps

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Who are Energy Capital?

Energy Capital is the policy and delivery body for energy in the West Midlands

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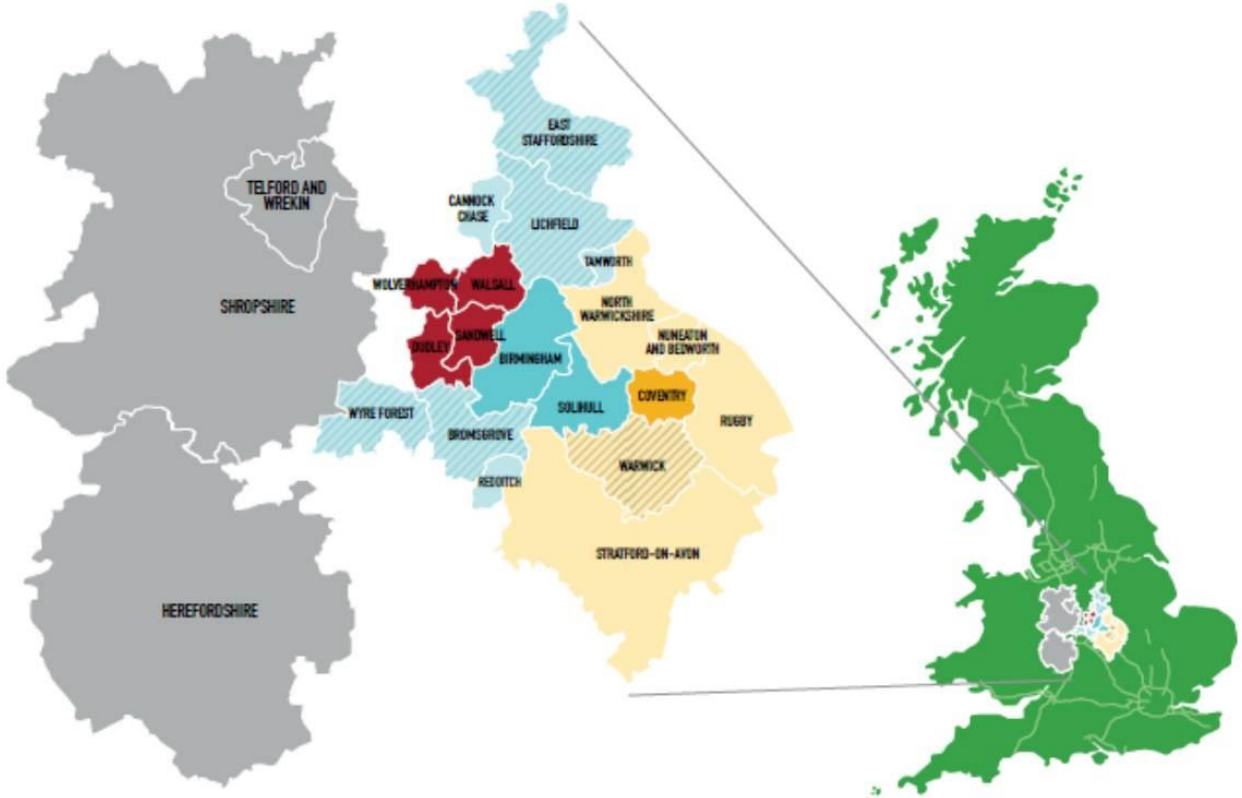

- **Responsible to the Mayor through the Energy Capital Board**
- **Public-private partnership**
- **Energy core to our local industrial strategy**
- £8bn p.a. spent on energy services
- 50,000 jobs
- 4 million people
- 2 million homes
- 200,000 homes in energy poverty
- 215,000 new build
- ~21M t CO_2 p.a.
- Significant investment programmes
- Centre of UK energy industry


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Your Gas Network


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nationalgrid


JAGUAR


LAND ROVER


SEVERN
TRENT

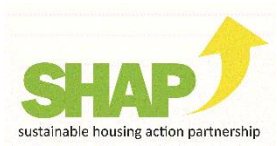

ENGIE


UK CENTRAL SOLIHULL
Urban Growth Company


Black Country LEP


Department for Business, Energy & Industrial Strategy


eef
The manufacturers' organisation


SHAP
sustainable housing action partnership


Ørsted


Birmingham City Council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Greater Birmingham & Solihull
Local Enterprise Partnership


ofgem


Coventry City Council


CWLEP
Coventry & Warwickshire
Local Enterprise Partnership


West Midlands
Growth Company


SUSTAINABLE
ENERGY ASSOCIATION


Black Country Housing Group


Westley Group


LIBERTY


Dudley
Metropolitan Borough Council

Transport for West Midlands


MIDLANDS ENGINE
HM Government


Sandwell
Metropolitan Borough Council


eco birmingham
Inspiring Positive Action


ceb
Community Energy Birmingham
share in our city's sustainable future


eit Climate-KIC


Webster & Horsfall
est.1720


tep
TYSELEY ENERGY PARK


Heart of England
Community Energy


Solihull
METROPOLITAN
BOROUGH COUNCIL


CITY OF
WOLVERHAMPTON
COUNCIL


Walsall Council


UNIVERSITY OF
WOLVERHAMPTON


UNIVERSITY OF
BIRMINGHAM

Aston University

BIRMINGHAM CITY
University

WARWICK
THE UNIVERSITY OF WARWICK

Coventry
University

CATAPULT
Energy Systems

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.

Energy Innovation Zones

Fuel poverty alleviation

ULEV Strategy

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National and Local Context

Why are we doing what we are doing?

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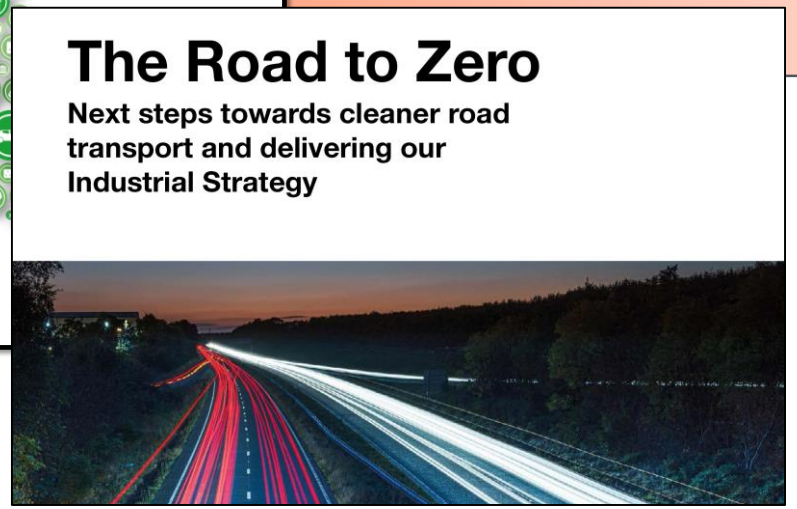
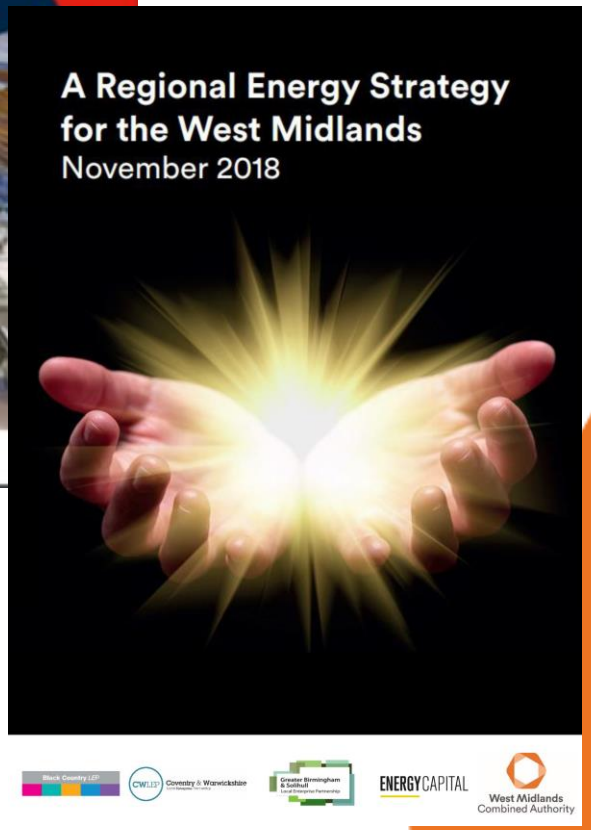
Clear policy trajectory





WMCA have declared a Climate Emergency

Zero carbon by **2041**

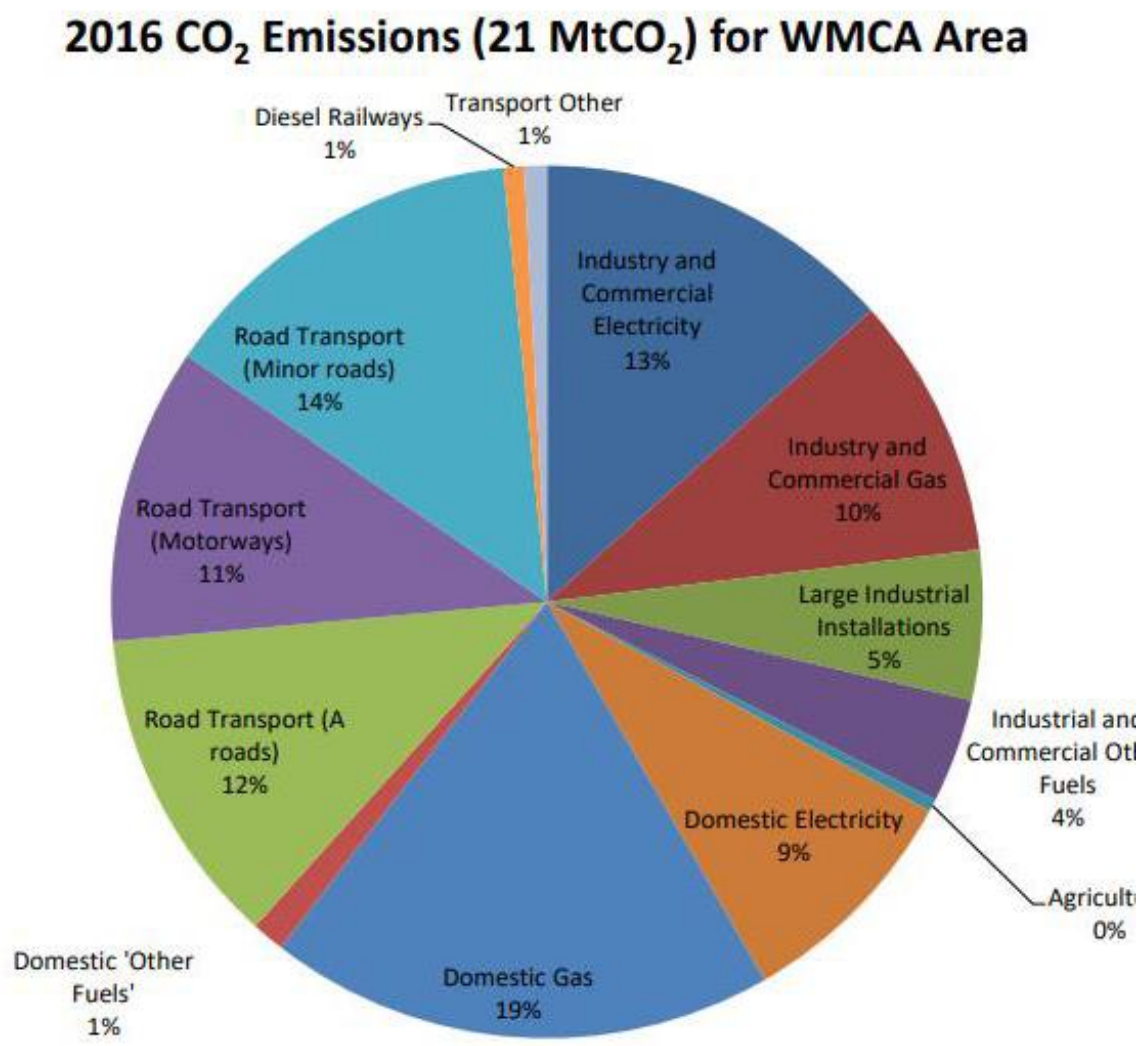
(36% reduction by 2022, 69% reduction by 2027)

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

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No gas boilers in new housing from 2025

No ICE engines in cars from 2040

BUT our electrical infrastructure is becoming strained

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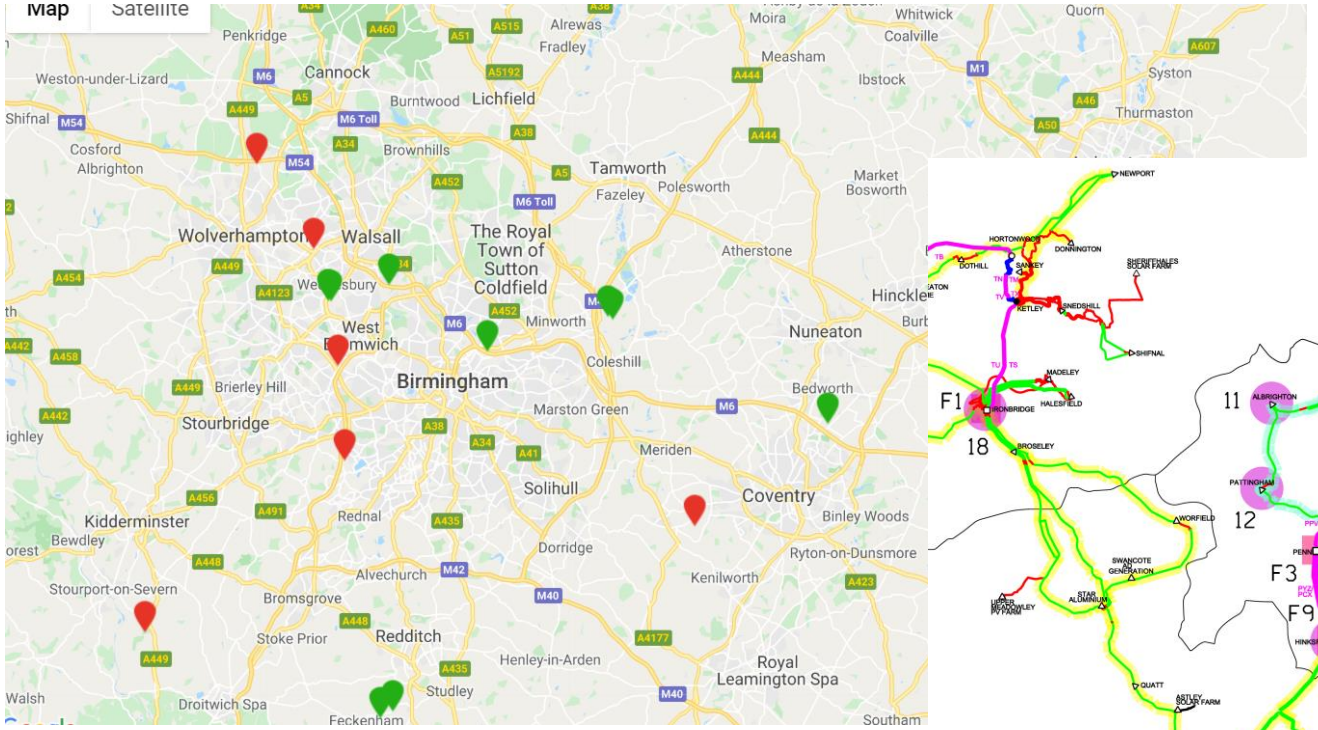

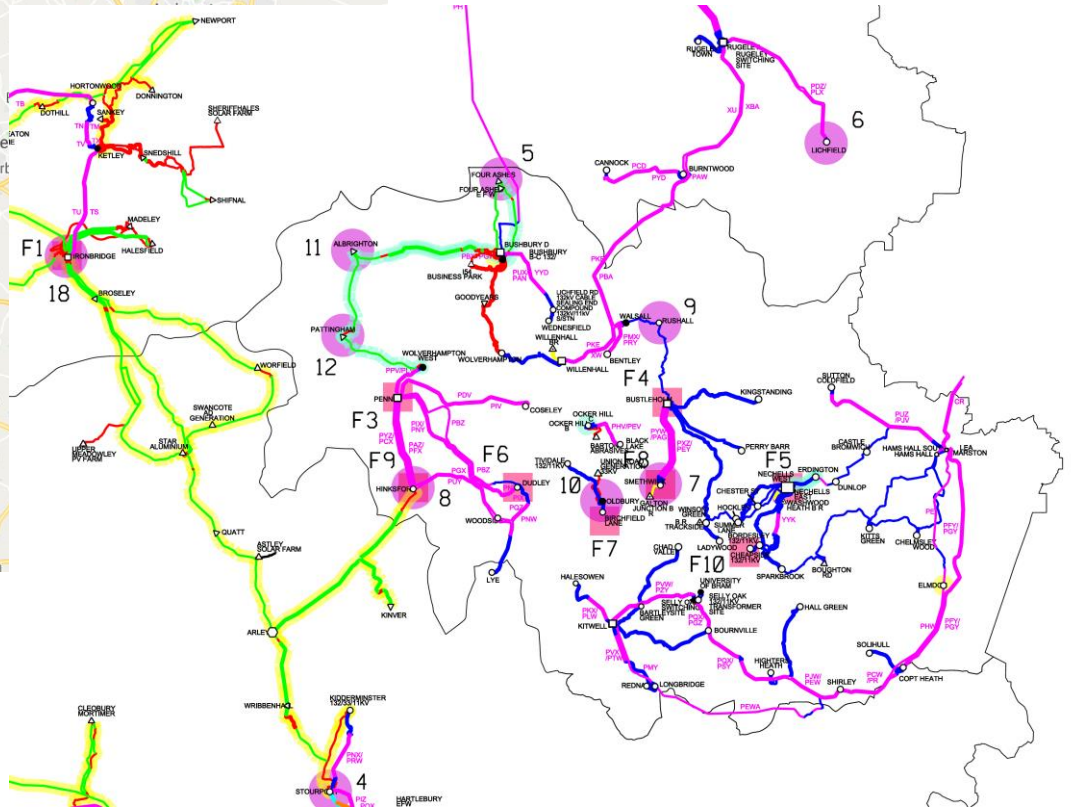

There are areas within the West Midlands where we have **already** reached capacity

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

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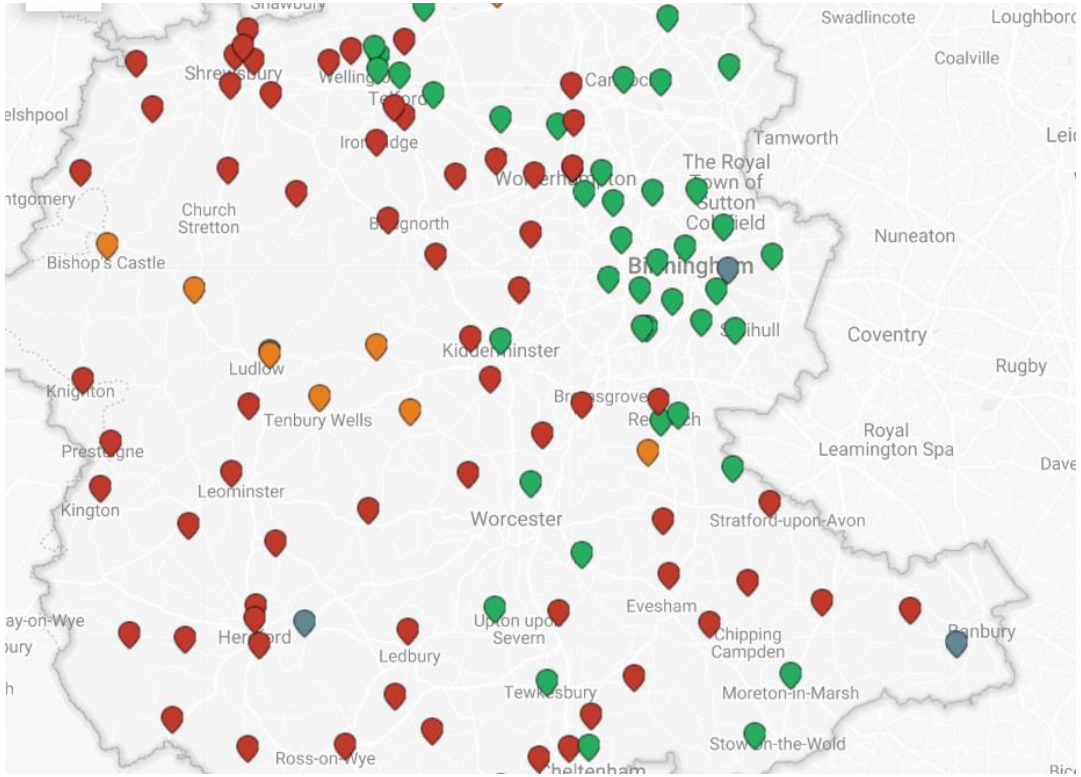
Table 1: WPD's July 2017 connections by technology in the West Midlands licence area

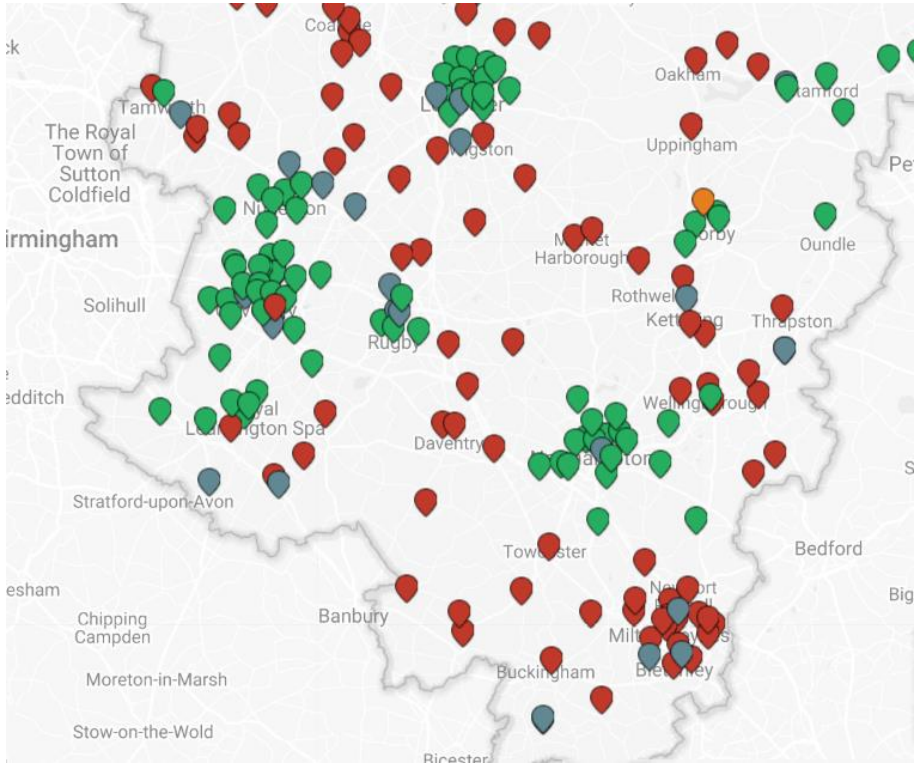
Generator type	Connected [MVA]	Accepted-not-yet-connected [MVA]	Offered [MVA]	Total [MVA]
Photovoltaic	591.4	282.4	22.1	895.9
Wind	48.1	4.0	4.0	56.1
Landfill gas, sewage gas, biogas and waste Incineration	202.0	64.0	5.6	271.5
CHP	13.8	32.8	303.0	349.5
Biomass and energy crops	32.9	16.5	-	49.3
Hydro,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

[1] www.bbc.co.uk/news/business-40198567

[2] www.gov.uk/government/uploads/system/uploads/attachment_data/file/622799/Renewables.pdf

BUT we are also constrained on infrastructure to distribute low carbon generation





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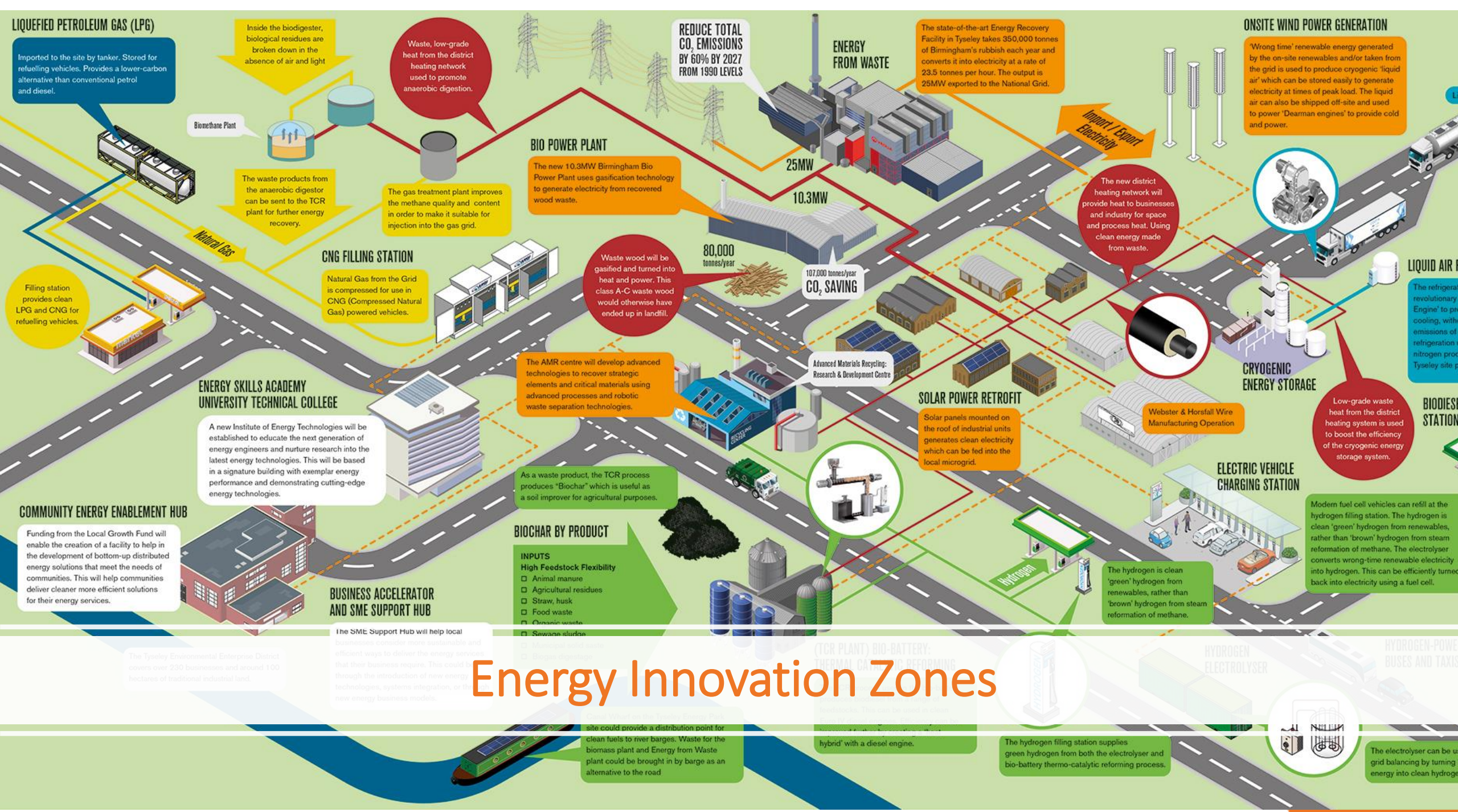
New Distributed Generation Capacity



Energy Innovation Zones

Prospering from the Energy Revolution (PFER)

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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)

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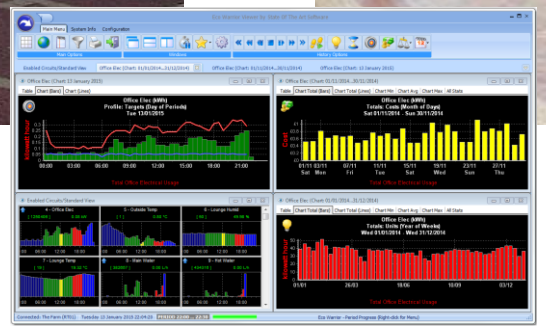
RESO – What's the big idea?



RESO – Key facets

Partners

West Midlands Combined Authority

UK Research and Innovation

Coventry City Council

WARWICK THE UNIVERSITY OF WARWICK

UNIVERSITY OF BIRMINGHAM

Camirus Ltd

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ELECTRON

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PLACES IN COMMON

Timescales 24 month project commencing 1st January 2020

Project deliverables

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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

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Our project must:

Take an inclusive whole system approach

- 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

with a financeable business model

- 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

underpinned by quality data

- 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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