

Distribution Future Energy Scenarios Stakeholder Consultation Event

WPD East Midlands licence area
Thursday 1st July 2021



A bit about Regen...

Regen is a mission-led membership organisation, a centre of energy expertise and market insight.

We work with community energy groups, local authorities, network operators, developers, and other stakeholders to help decarbonise, decentralise, and democratise the energy system.



Agenda

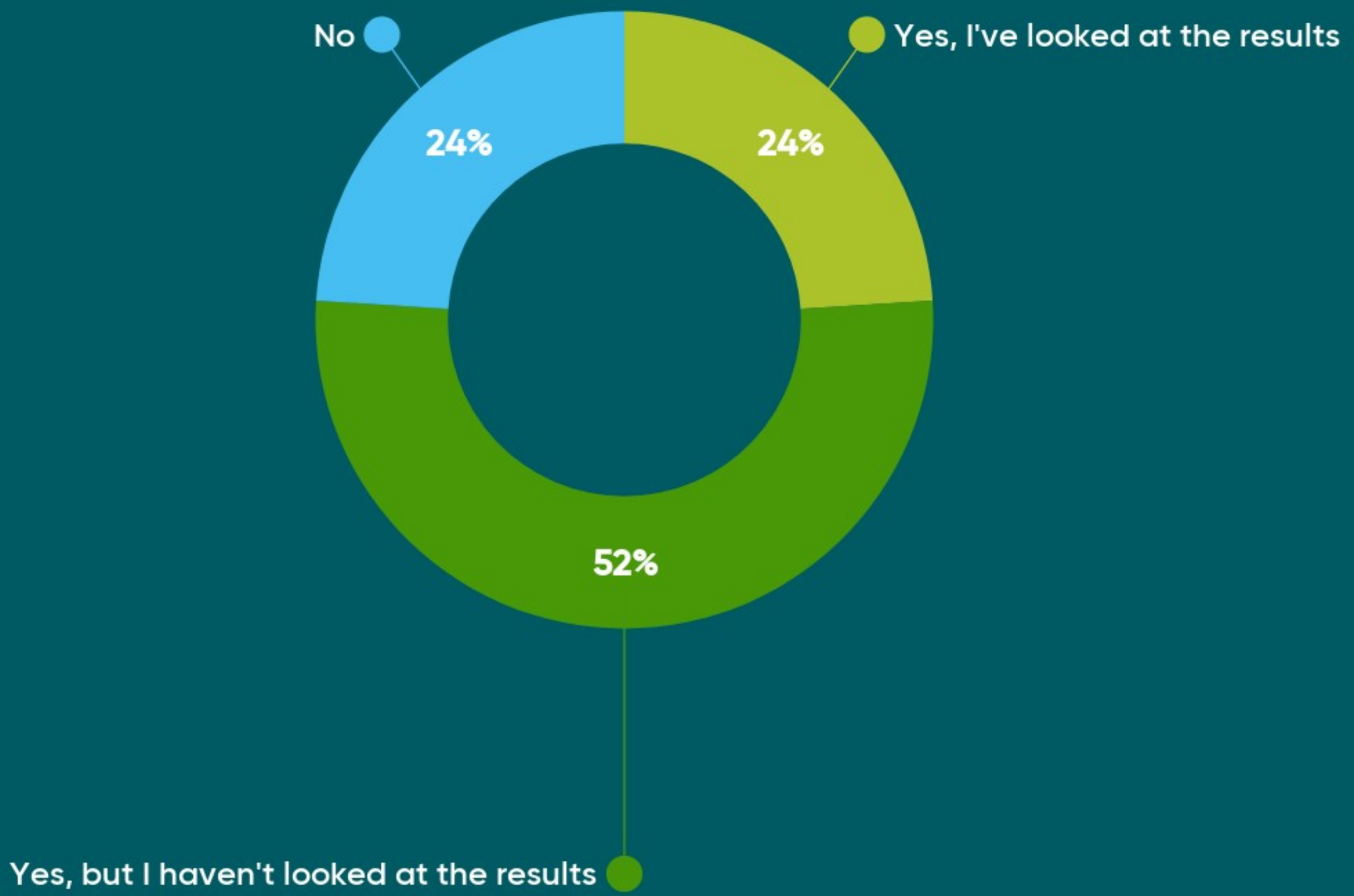
- WPD - Network strategy for net zero distribution future energy scenarios
- Regen - Modelling the 2021 future energy scenarios
- Q&A



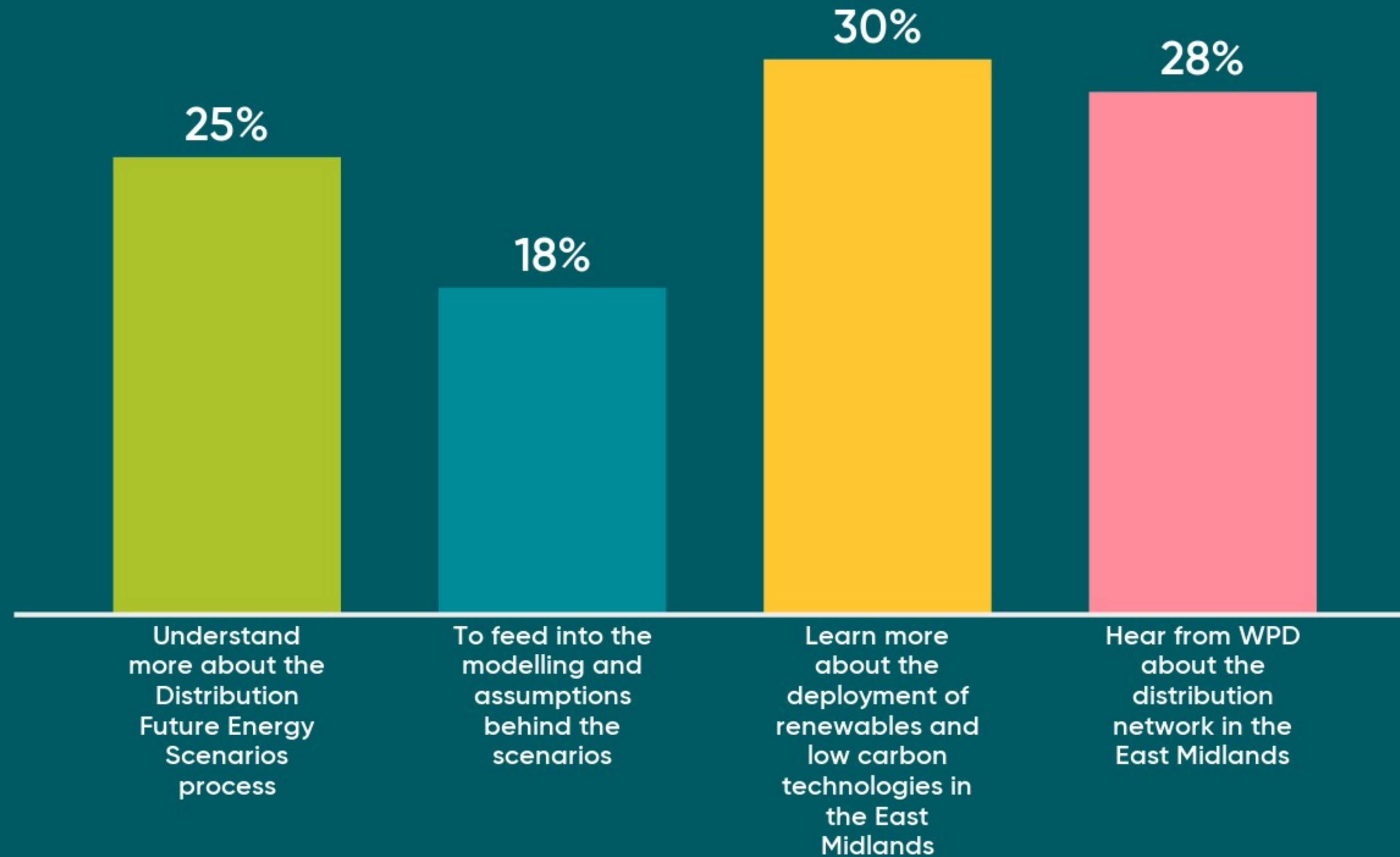
The key role of stakeholders

- Reflecting regional variation and considerations
- Testing modelling assumptions
- Informing technology-specific projections
- Direct engagement on projects, developments and future possibilities
- Reflecting local authority new development plans and energy strategies

Were you aware of the WPD Distribution Future Energy Scenarios process before today?



What do you want to get out of today?

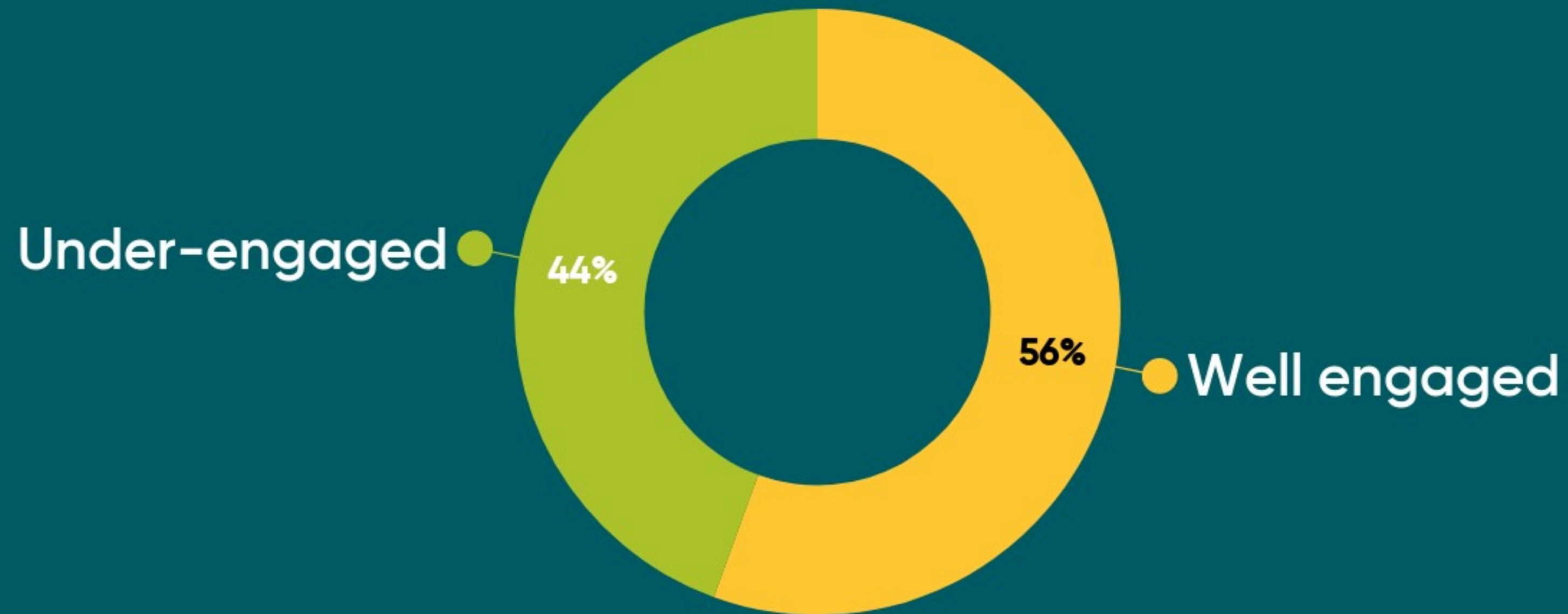


WPD – Network strategy for net zero future energy scenarios

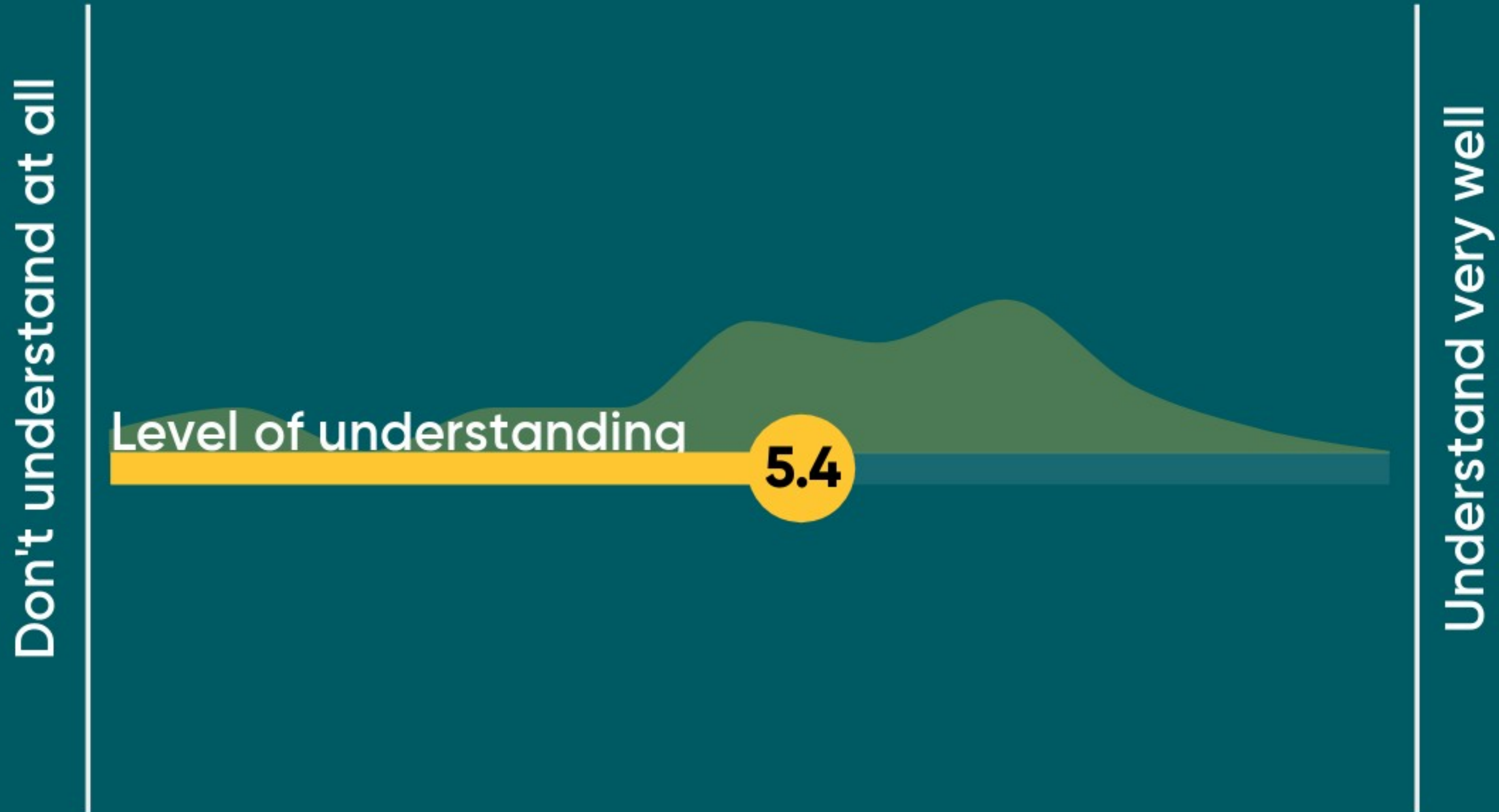
→ Oli Spink – network strategy engineer, WPD



How would you rate your level of engagement with WPD?



In your opinion, how well do you understand the relationship between National Grid FES, WPD DFES, and Local Area Energy Planning?



In addition to the current DFES outputs, what further outputs would you find useful?

Current publications include:

- The DFES dataset
- The DFES online map
- A methodology slidepack
- Summary 'regional view' reports for each licence area
- Technology summaries by licence area

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East Midlands licence area context and analysis input

- Jonty Haynes - senior energy analyst, Regen
- Grace Millman - energy analyst, Regen



Distribution-connected electricity generation, such as:



- Onshore and offshore wind
- Ground-mounted and rooftop solar PV
- Hydropower
- Anaerobic digestion
- Landfill and sewage gas



- Gas- and hydrogen-fired power
- Gas-fired combined heat and power
- Diesel generation
- Waste incineration

Distribution-connected electricity storage, such as:



- Battery storage for grid services, co-located with renewables, for high energy users and small-scale battery storage
- Non-battery storage, such as liquid air energy storage

New sources of distribution-connected electricity demand, such as:



- Domestic heat pumps
- District heating heat pumps
- Direct electric heating
- Night storage heaters
- Thermal storage



- Electric cars and LGVs
- Electric HGVs
- Electric buses
- Electric vehicle chargers



- New housing developments
- New business space developments
- Hydrogen electrolysers

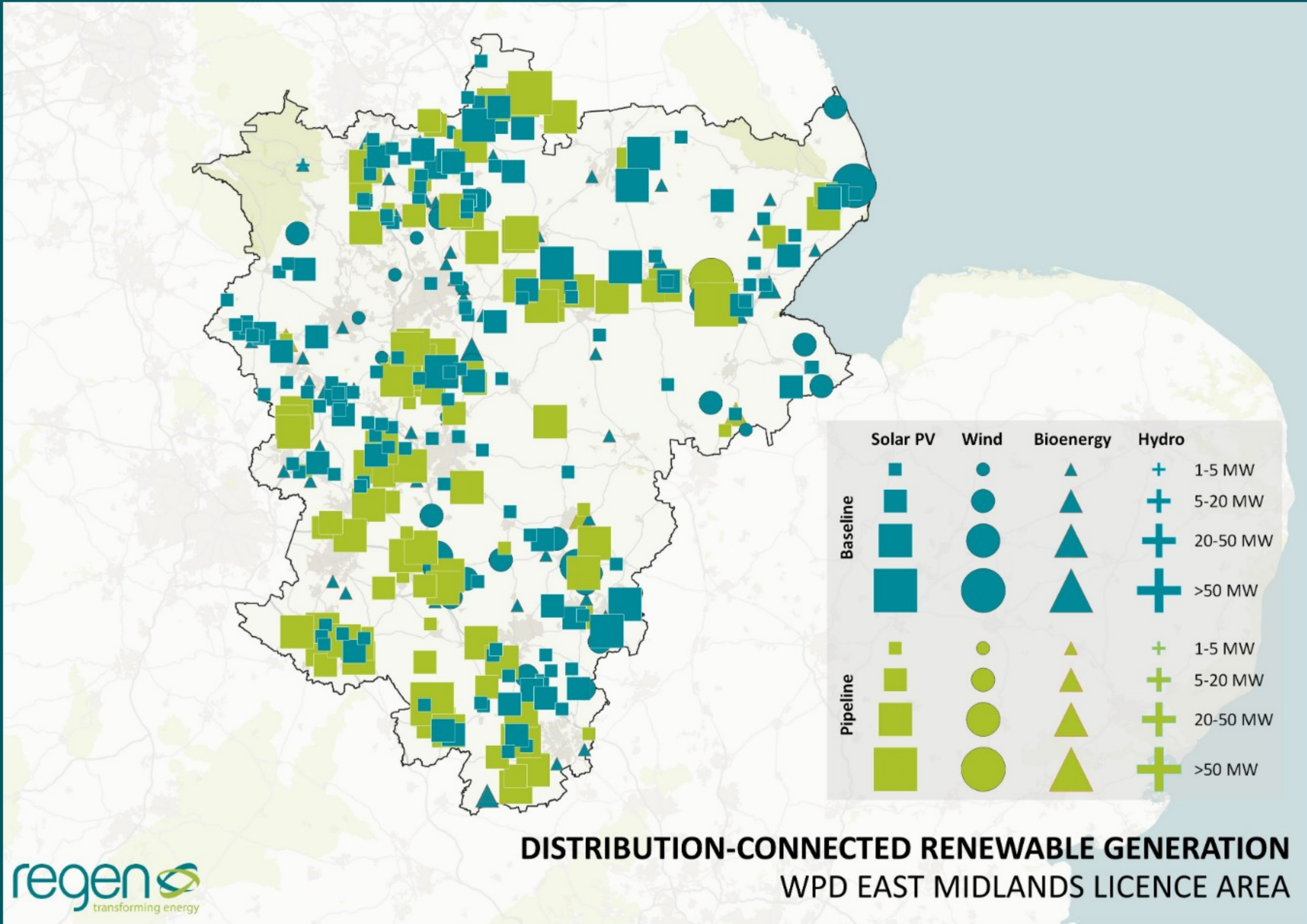
The scope of Distribution Future Energy Scenarios



Renewable generation

→ Jonty Haynes – senior energy analyst, Regen





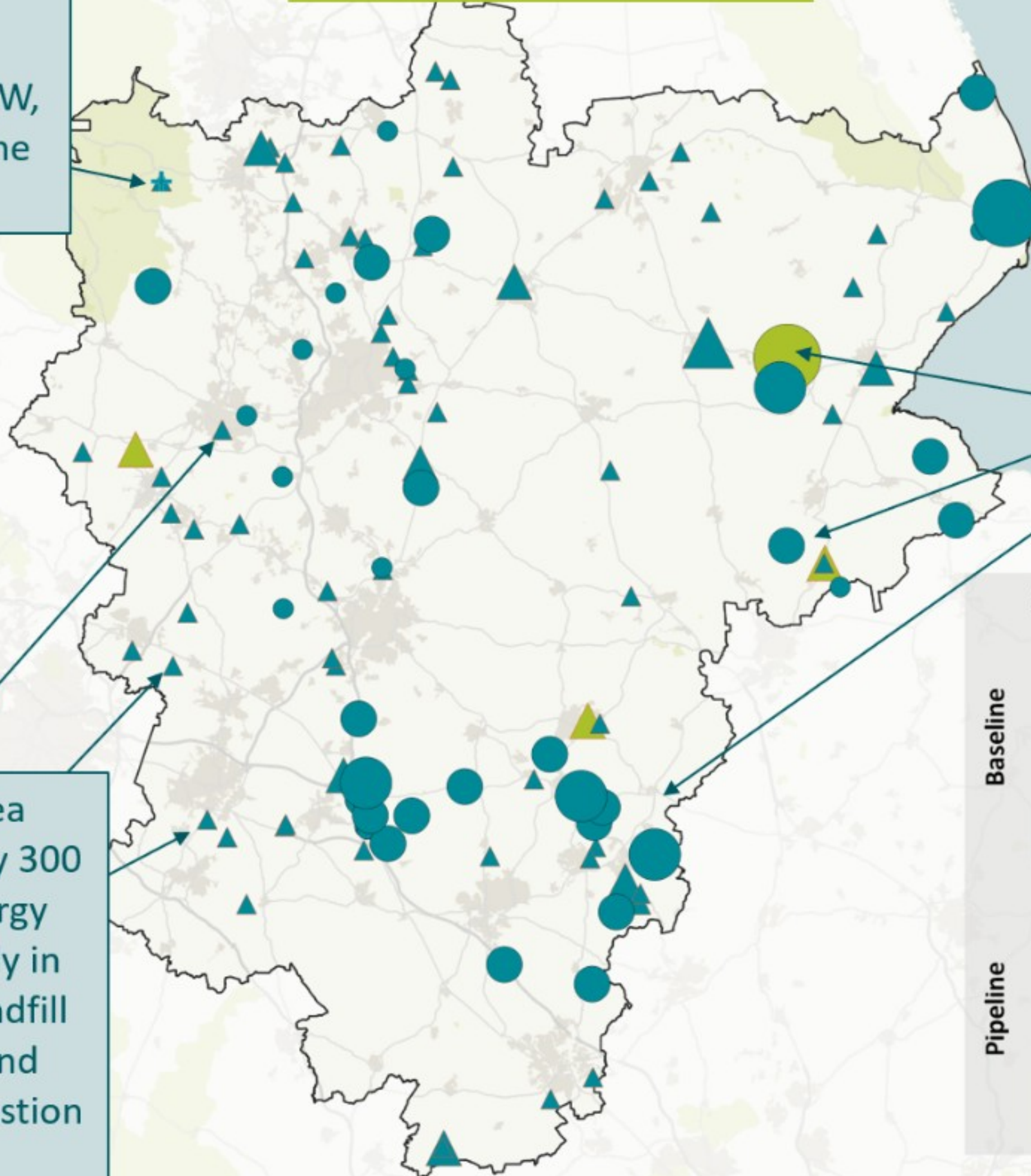
Excluding solar PV

Only one hydropower site over 1 MW, situation in the Peak District

Lynn and Inner Dowsing offshore wind farms, totalling 194 MW capacity, connect here.

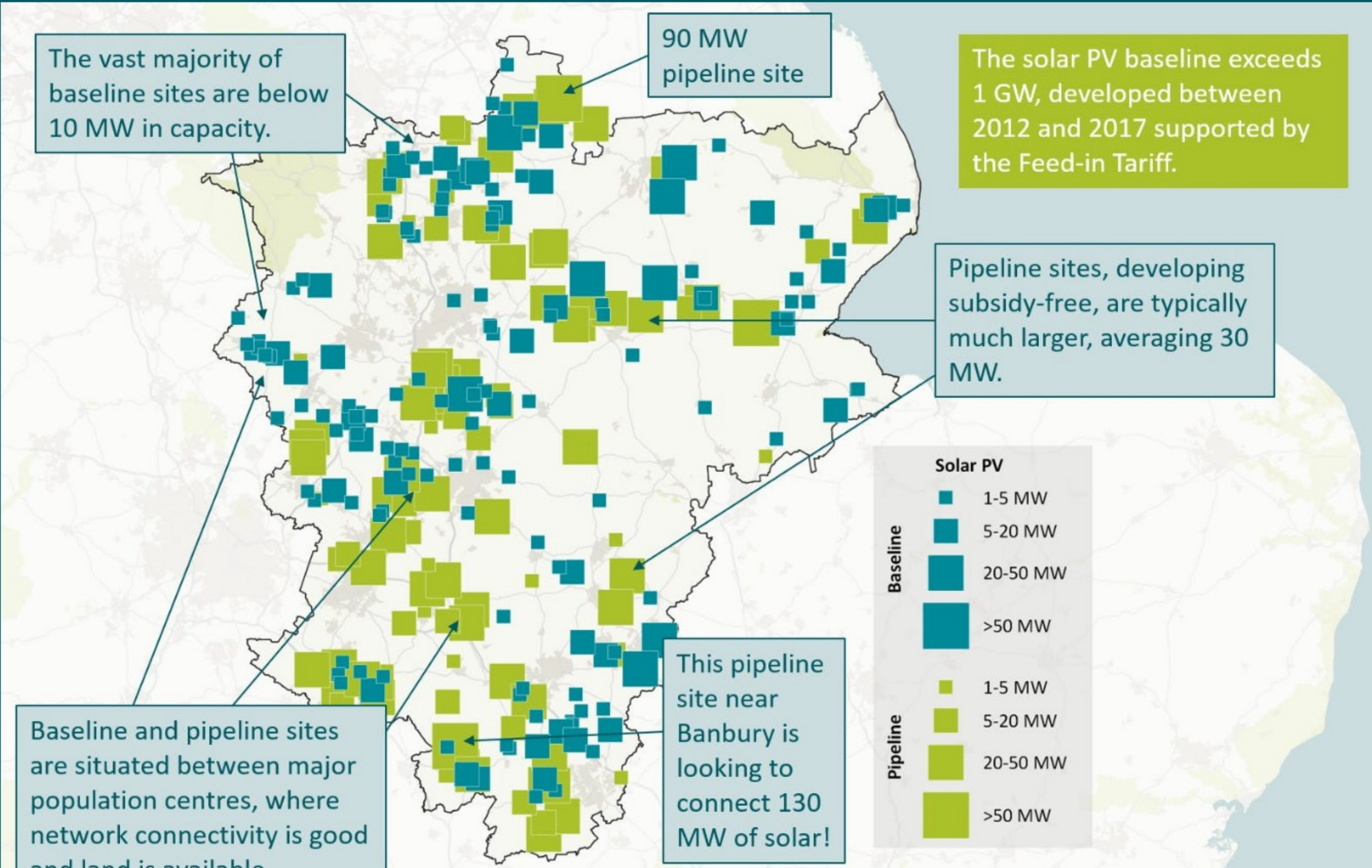
There is over 400 MW of onshore wind capacity in the baseline, mainly in the east and southeast of the licence area, but only two pipeline projects.

The licence area contains nearly 300 MW of bioenergy capacity, mainly in the form of landfill gas, biomass and anaerobic digestion (53 MW).



	Solar PV	Wind	Bioenergy	Hydro	
Baseline					1-5 MW
					5-20 MW
					20-50 MW
					>50 MW
Pipeline					1-5 MW
					5-20 MW
					20-50 MW
					>50 MW

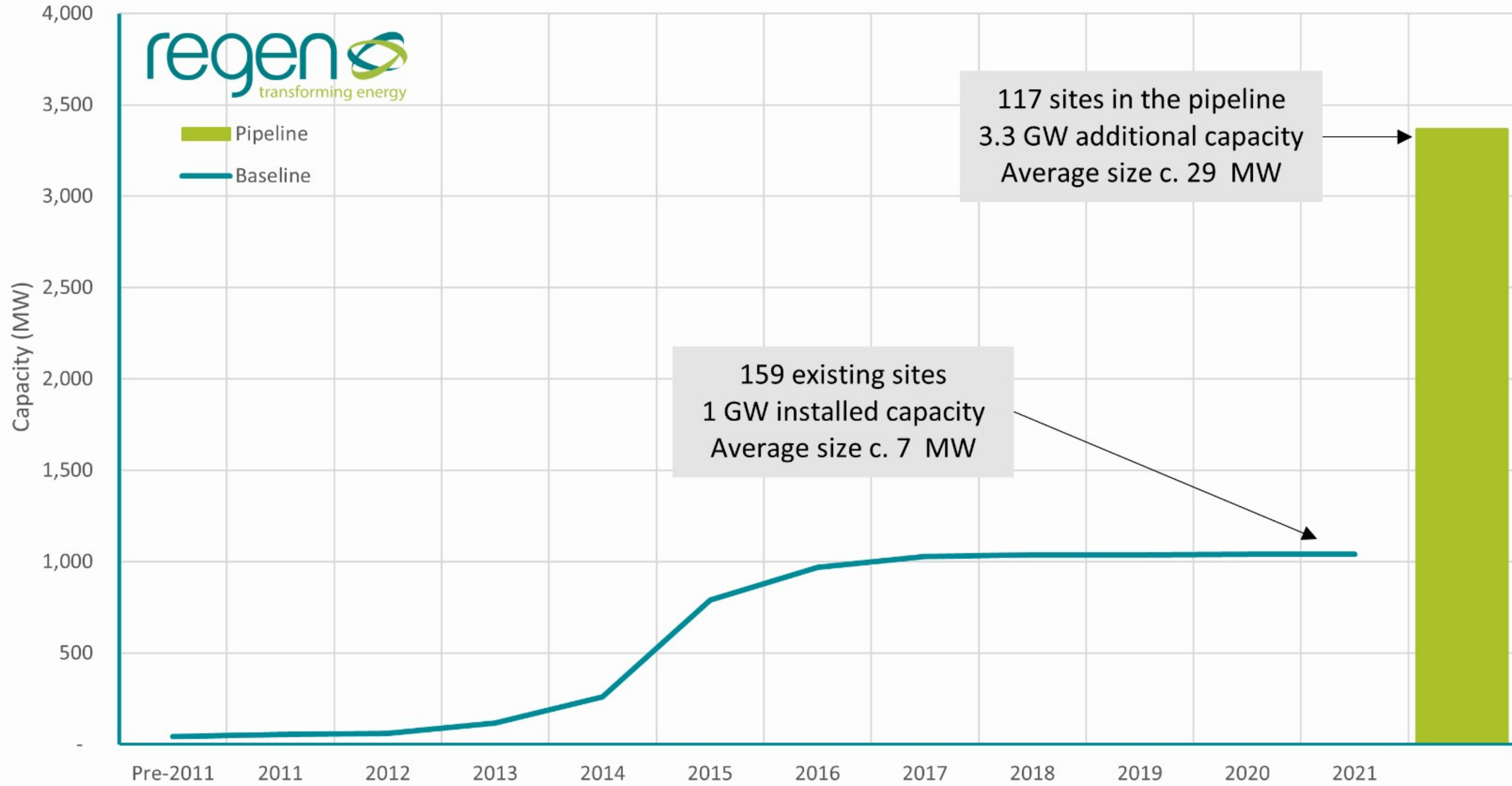
DISTRIBUTION-CONNECTED RENEWABLE GENERATION
WPD EAST MIDLANDS LICENCE AREA



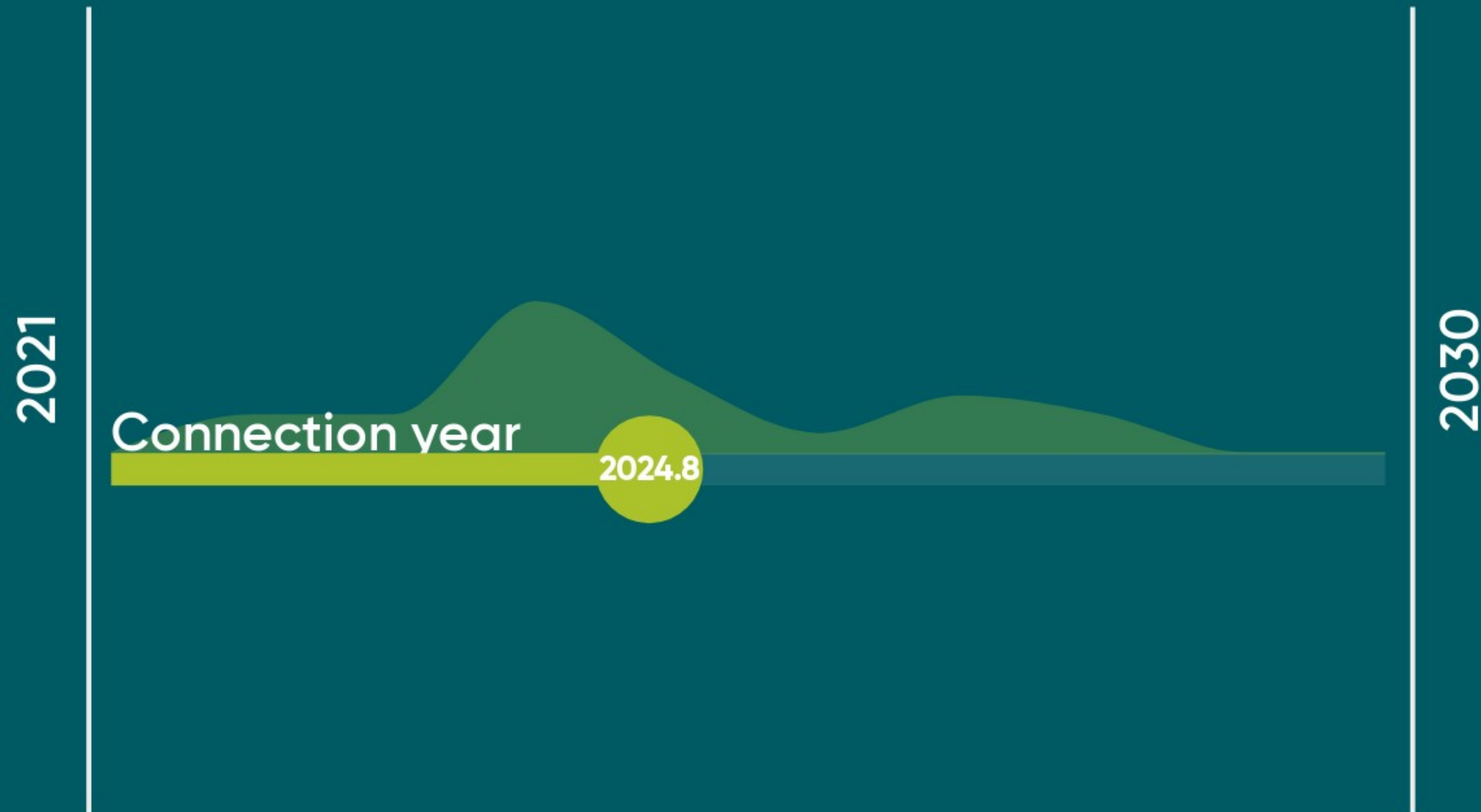
DISTRIBUTION-CONNECTED GROUND-MOUNTED SOLAR
WPD EAST MIDLANDS LICENCE AREA



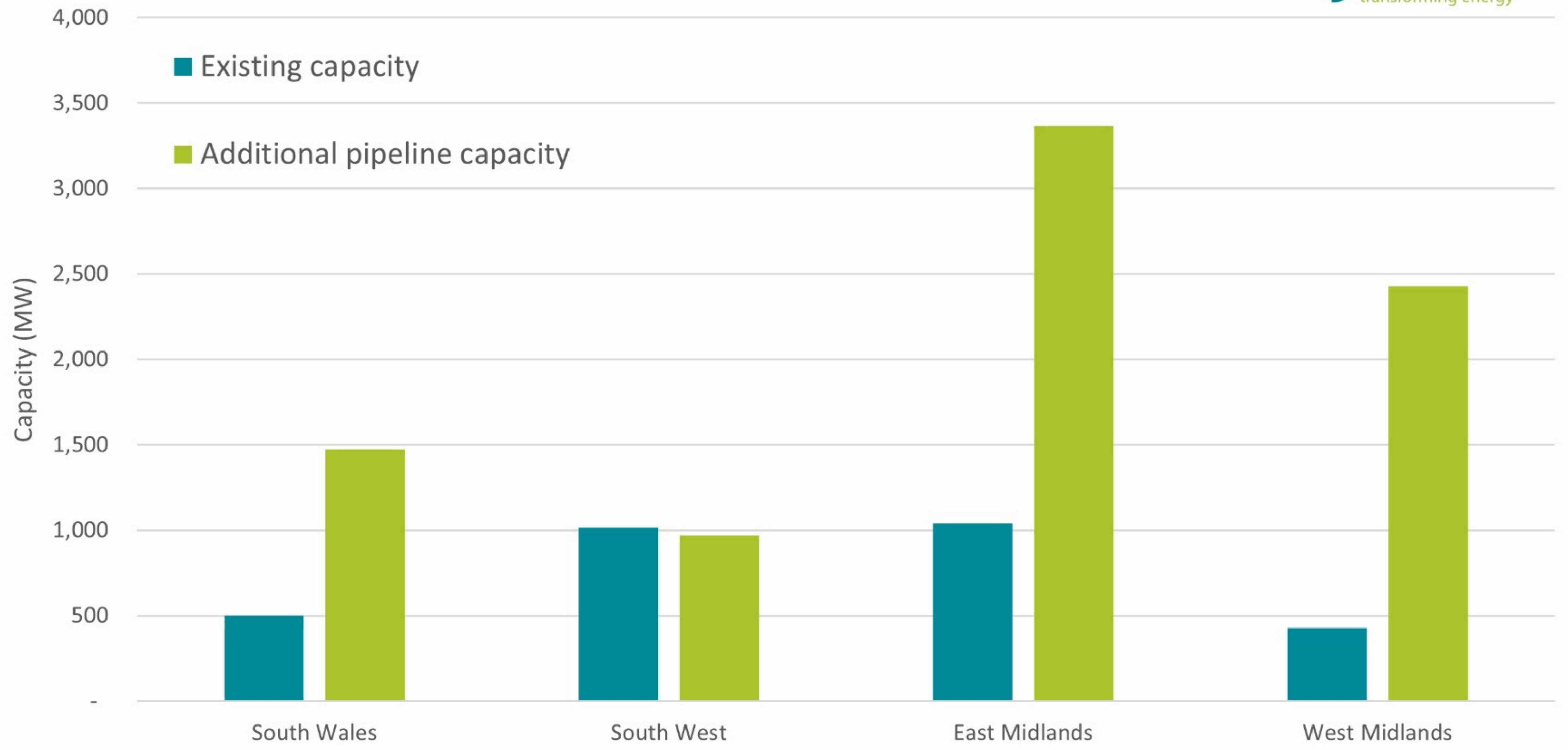
Large scale solar PV capacity in the East Midlands licence area



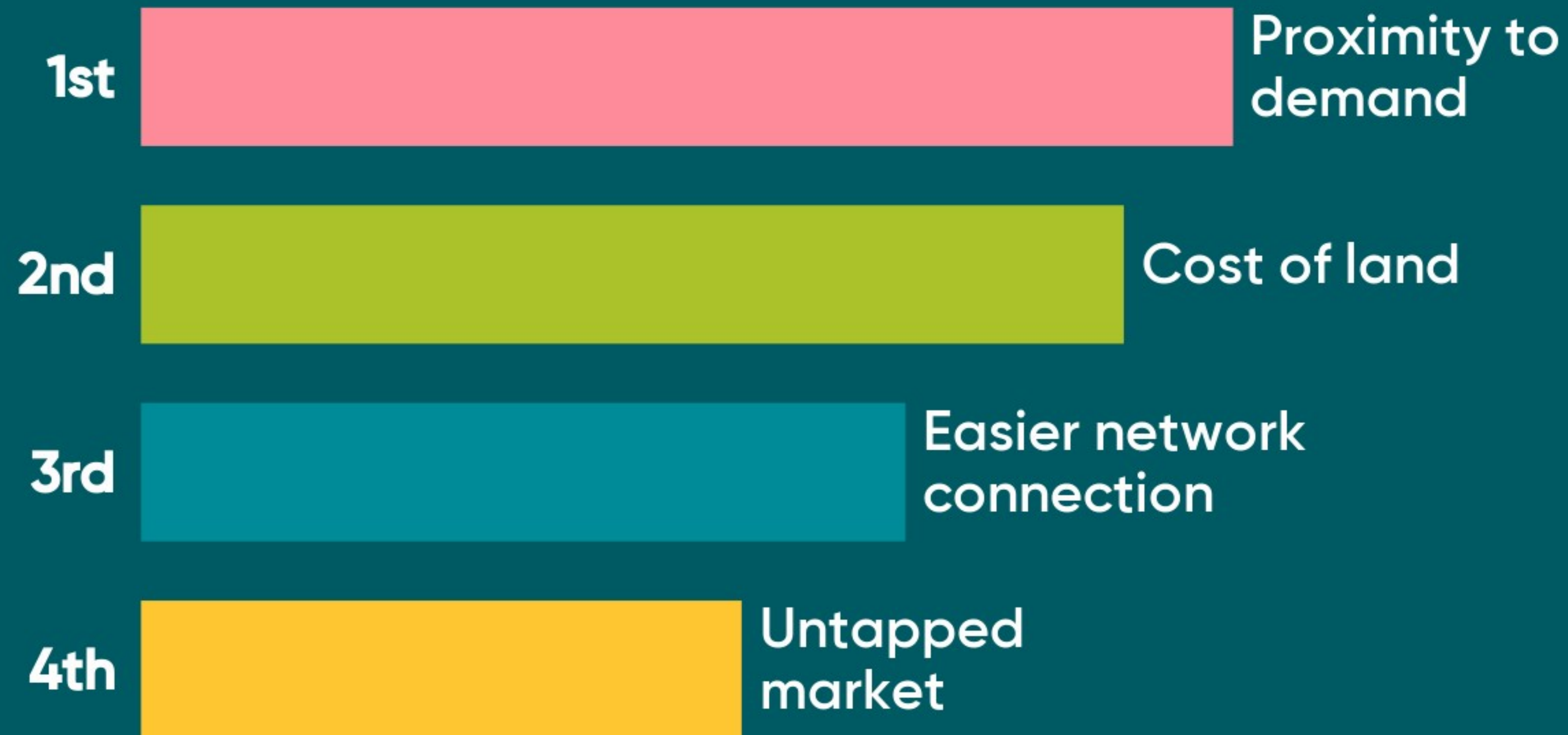
When will the large-scale solar pipeline start connecting in the East Midlands?



Large scale solar PV pipeline capacity by WPD licence area



Why is the East Midlands' solar pipeline even bigger than surrounding regions'?



Bioenergy

→ Grace Millman - energy analyst, Regen

Industrial and residential heat



Hydrogen production



Transport fuel for shipping,
aviation and road transport



BECCS



Power generation

Future bioenergy uses for net zero emissions



What will be the long-term role of distribution-scale bioenergy electricity generation?



Flexibility and storage

→ Grace Millman - energy analyst, Regen

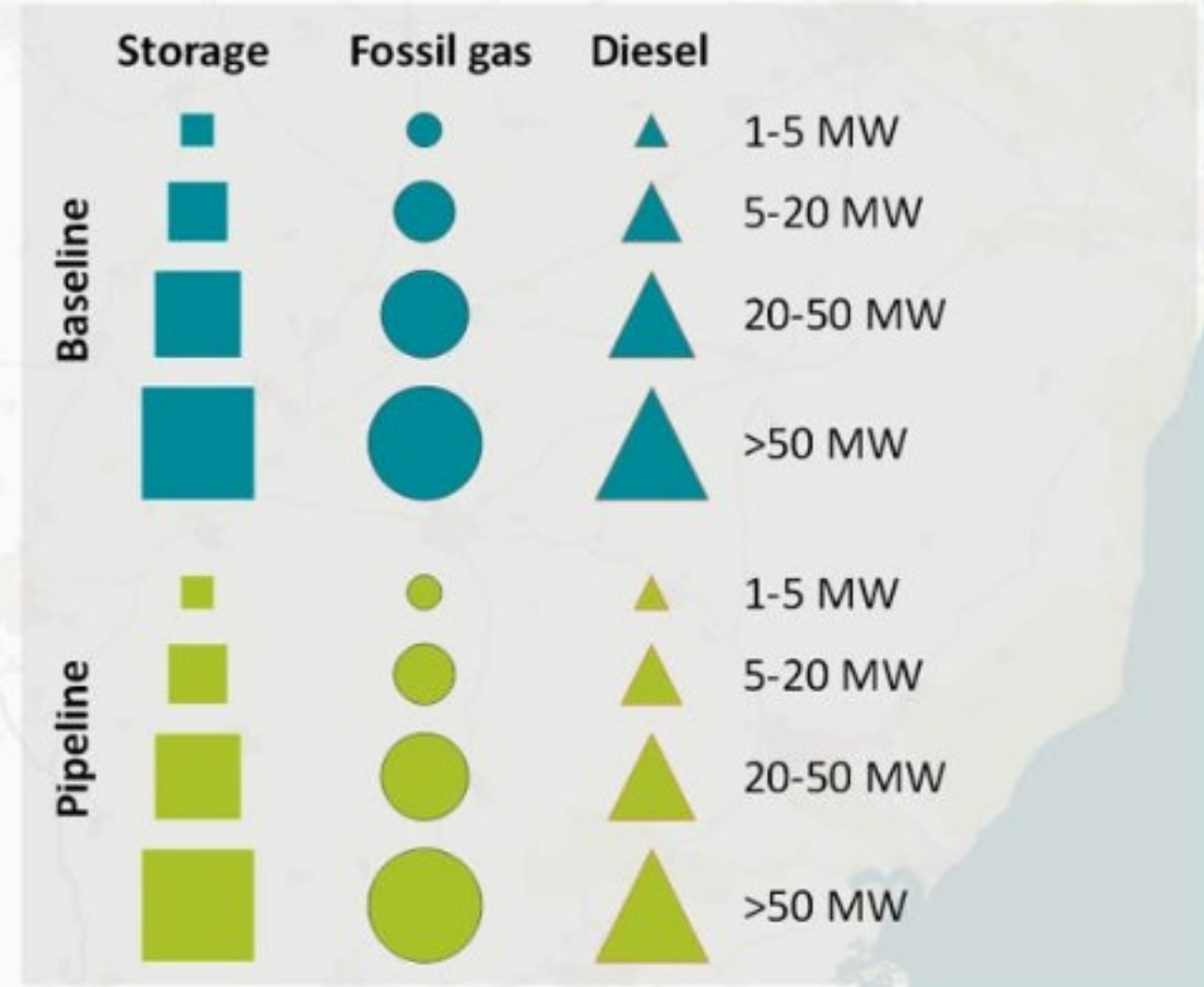


The baseline consists mainly of flexible gas and diesel generation, in and around population centres.

The pipeline consists mainly of battery storage projects, totalling over 750 MW of potential capacity. Most of these sites will be providing grid flexibility services, or collocated alongside renewable generation.

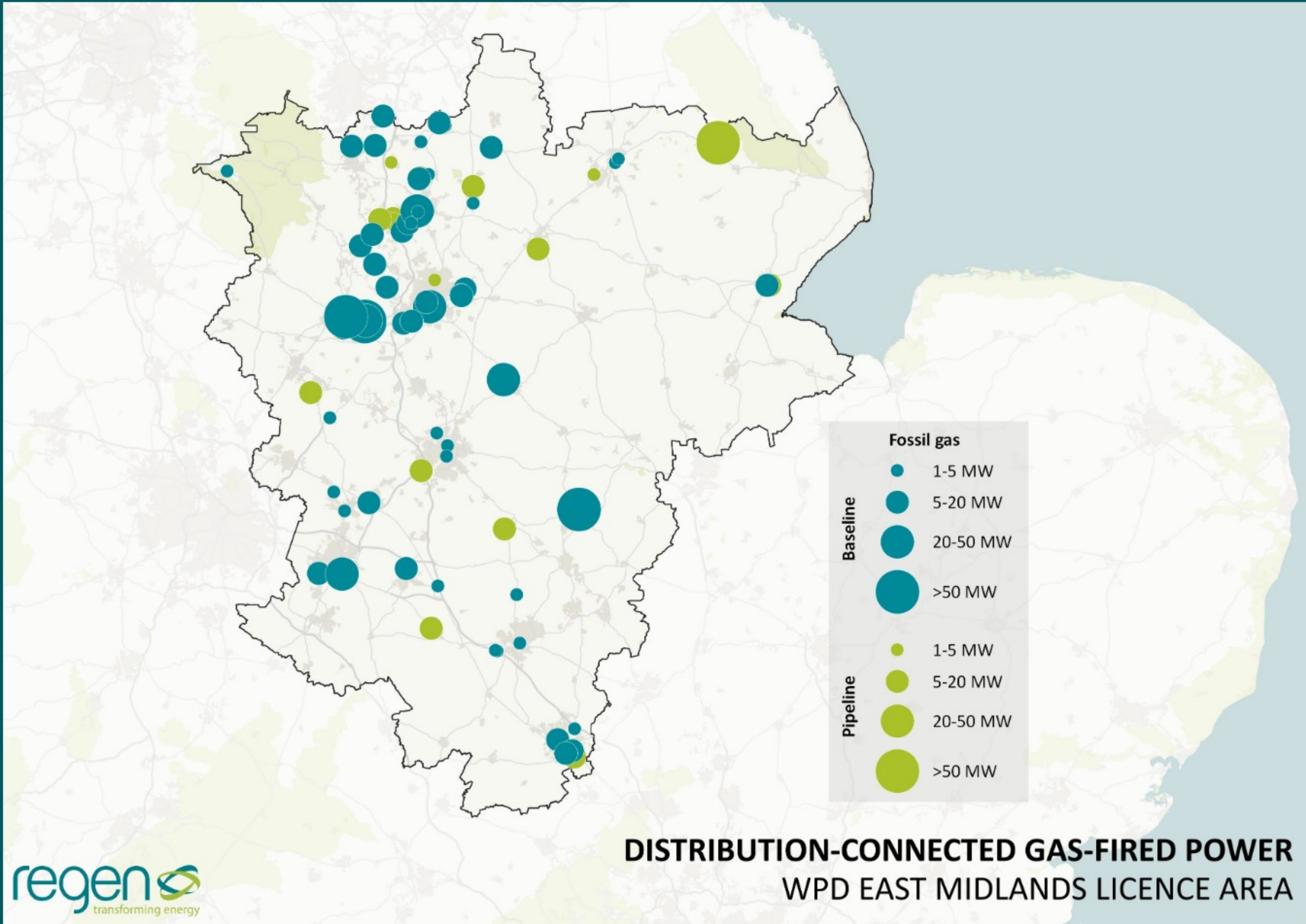
The 214 MW Derwent Power Station, has been mothballed since 2012 and is set to be demolished.

The 350 MW Corby Power Station, a gas-fired CCGT, connects to WPD's 132 kV network.

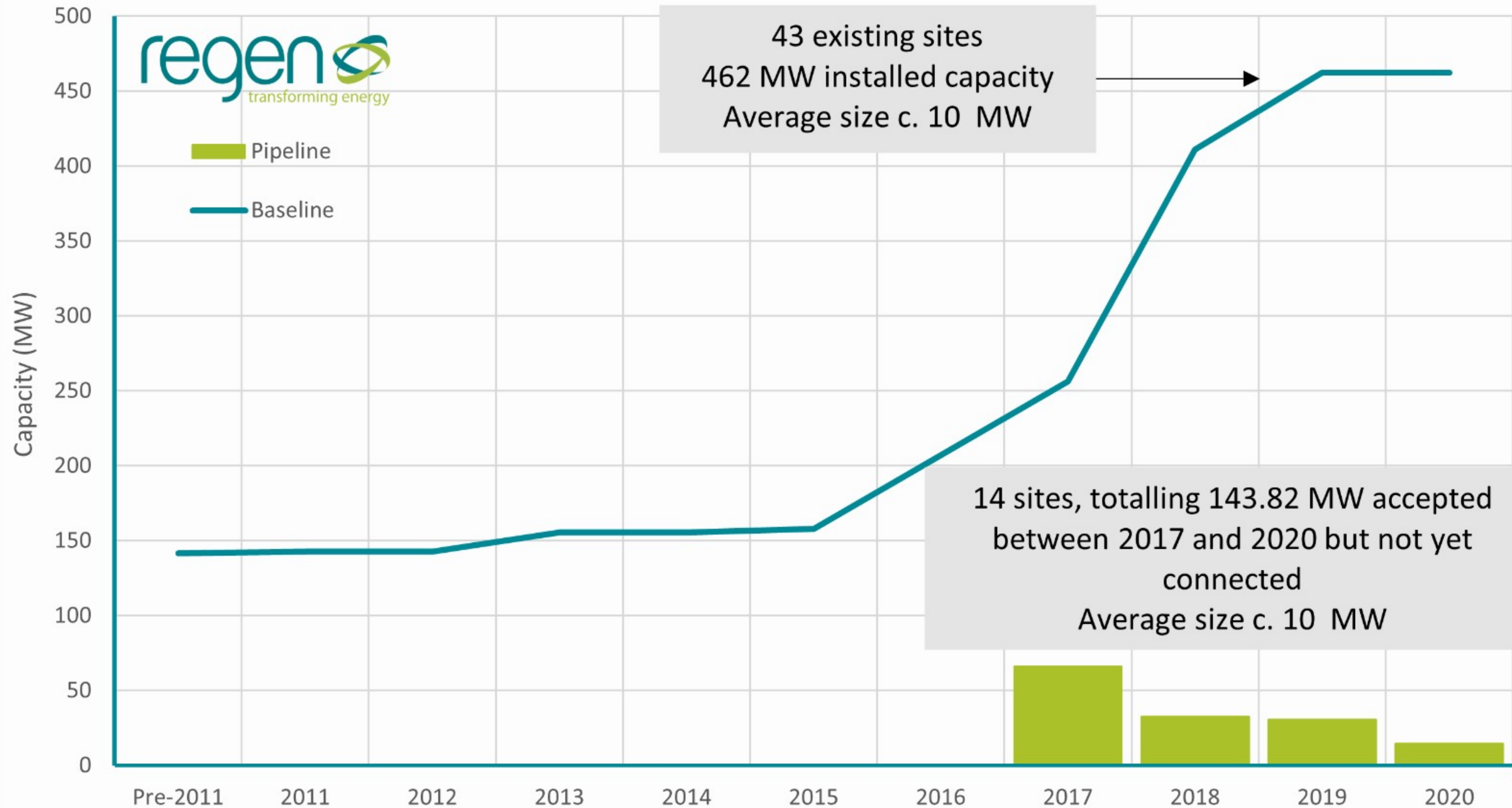


DISTRIBUTION-CONNECTED FLEXIBILITY AND STORAGE
WPD EAST MIDLANDS LICENCE AREA

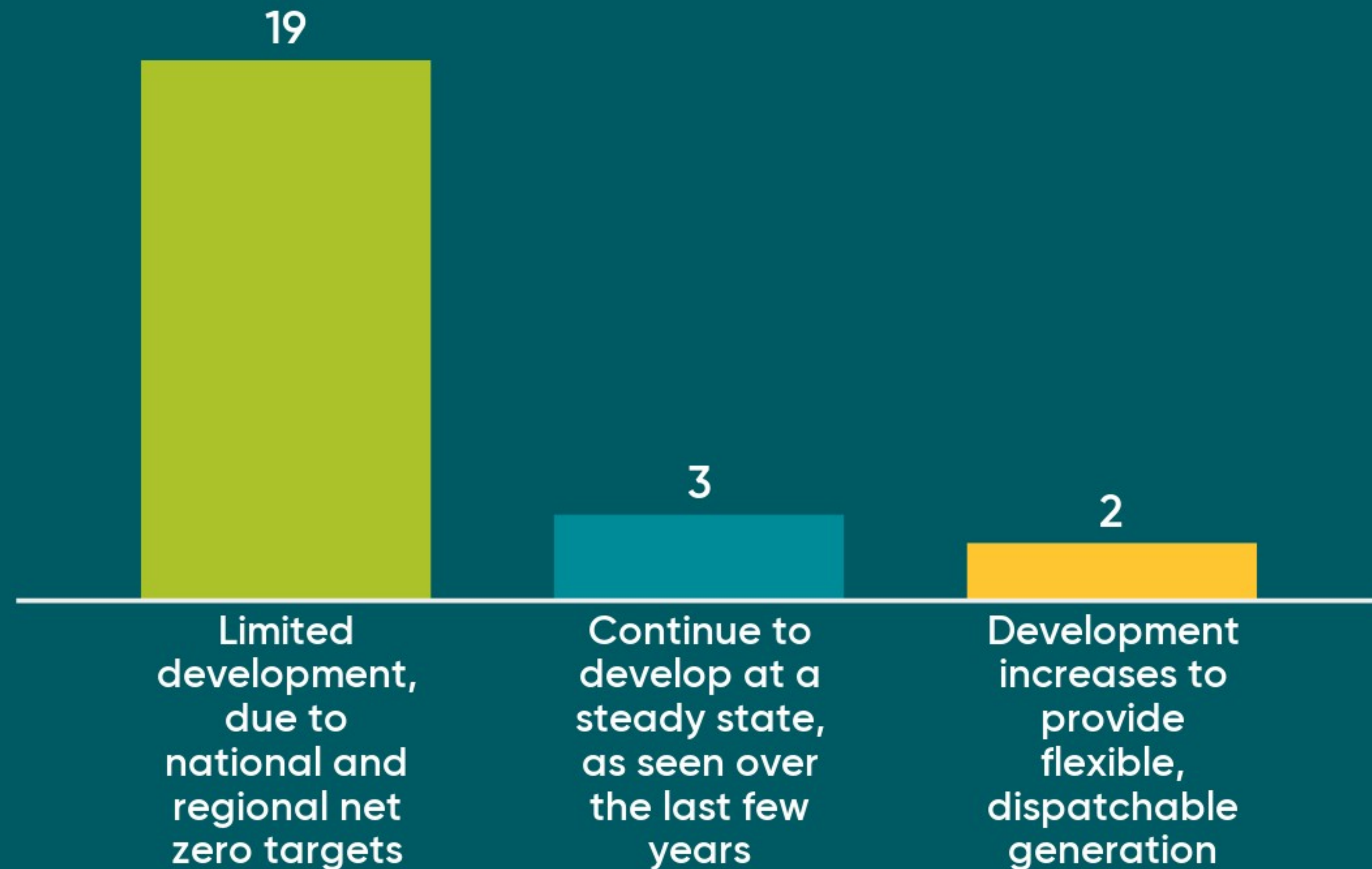


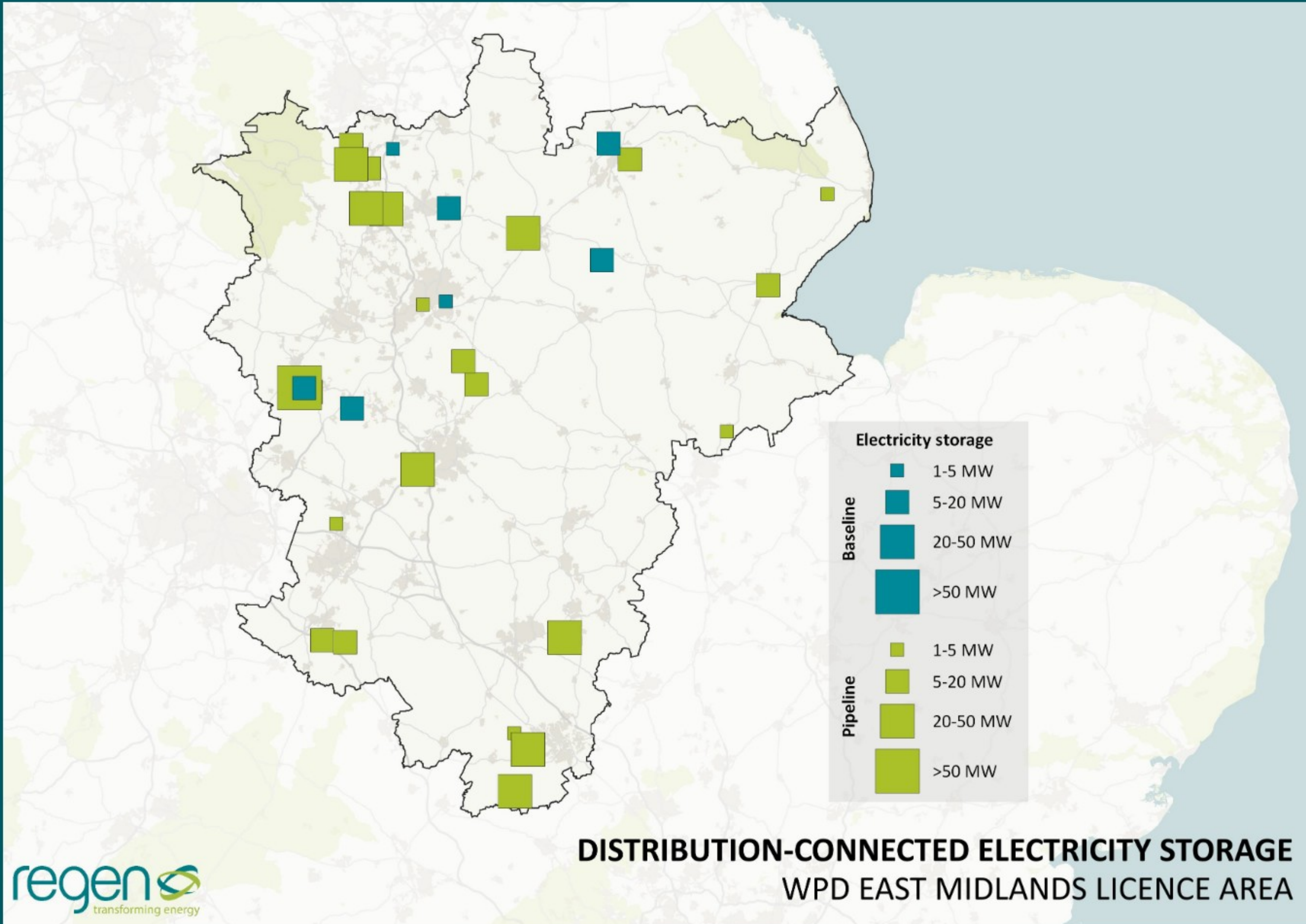


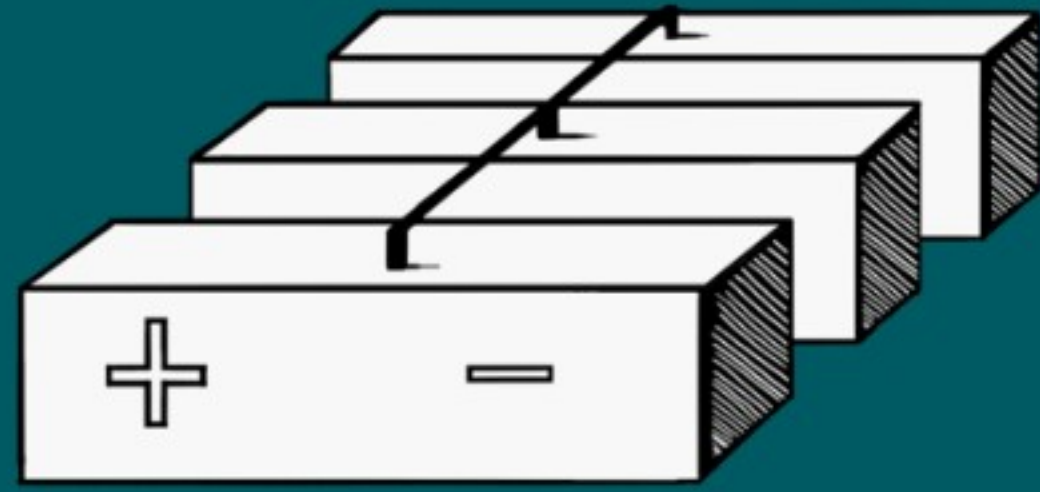
Fossil gas generation capacity in the East Midlands licence area



How might flexible gas-fired generation develop in the coming decade?







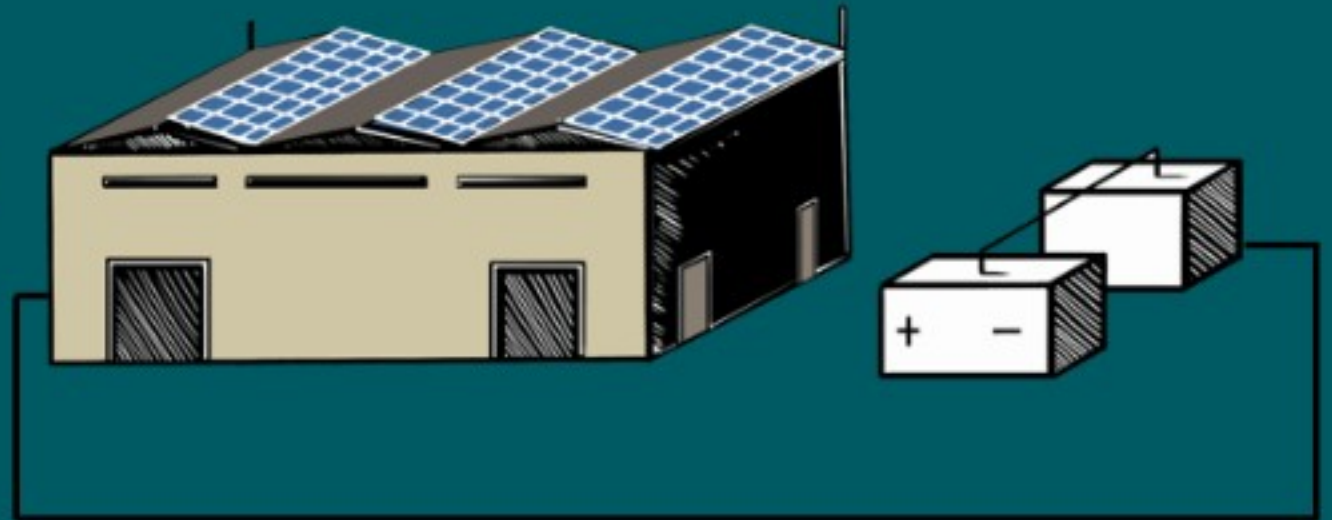
Standalone network services

Multi-MW scale batteries providing balancing, flexibility and support services to the grid

Co-location
Multi-MW scale sited alongside renewable energy generation projects



High energy user
Single MW scale sited at large energy user operational sites to support onsite energy management

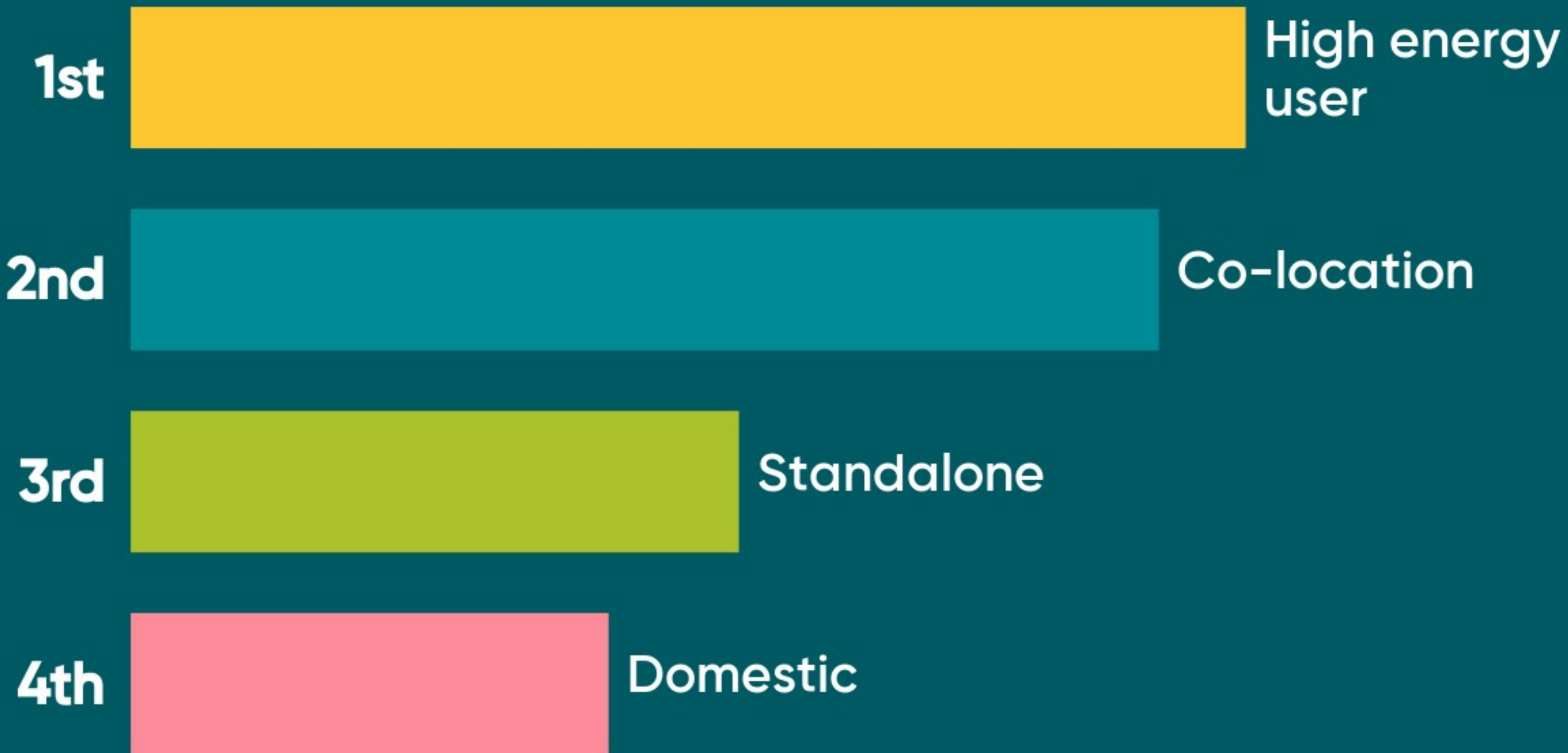


Domestic

10-20 kW scale batteries installed in households use alongside rooftop PV or provide back up services

Electricity storage business models

Which storage business model will see the most growth over the near and medium term in the East Midlands?



Hydrogen

→ Grace Millman - energy analyst, Regen





Decarbonising existing hydrogen production

Transport fuel for HGVs/buses, aviation, and shipping (potentially in the form of ammonia)



Electricity generation



Firing high temperature industrial processes

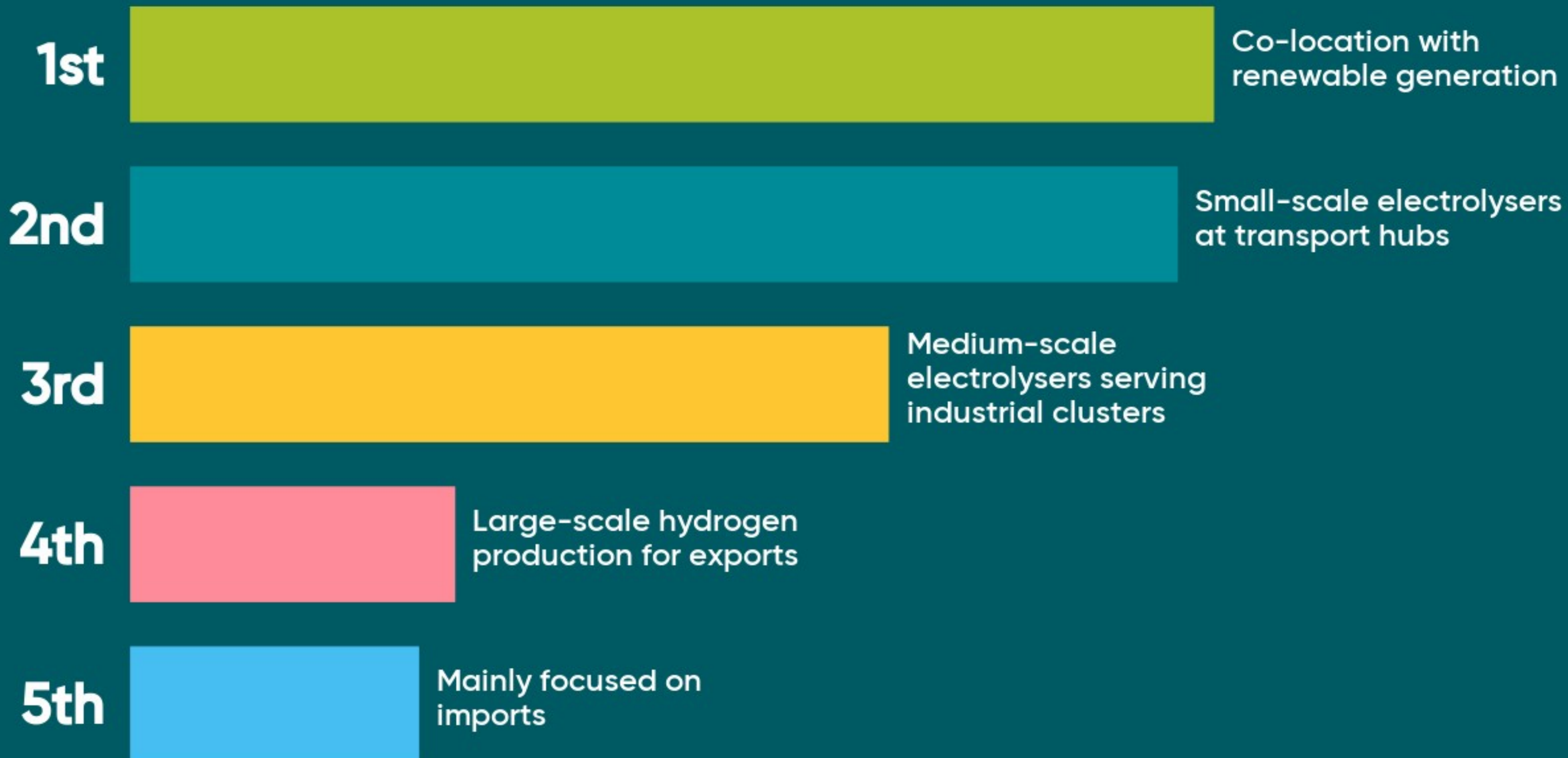


Heating homes and businesses

Potential uses of green hydrogen



Which hydrogen business models will see the most growth over the near and medium term?

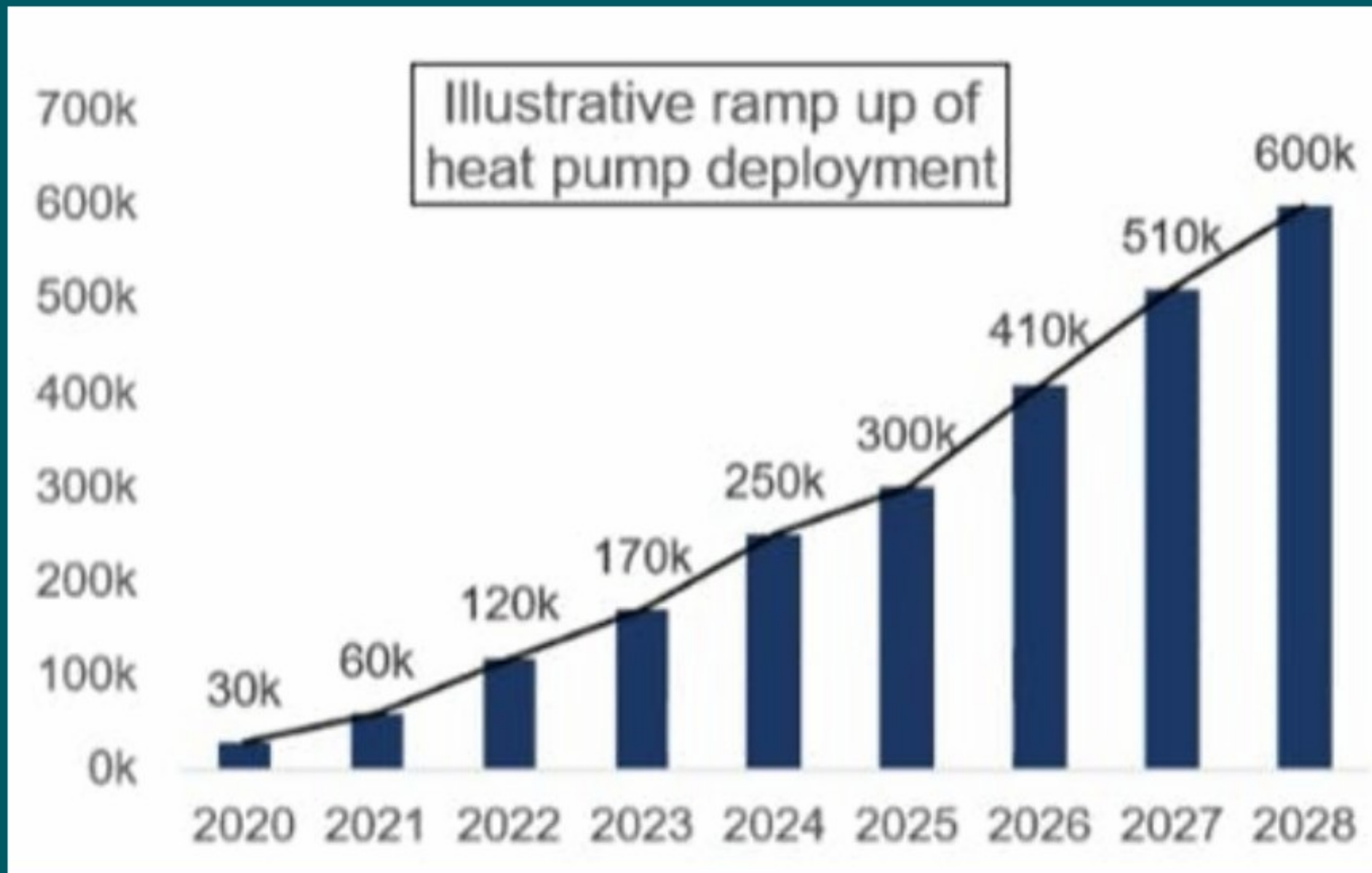


Electrified domestic heat

→ Jonty Haynes – senior energy analyst, Regen

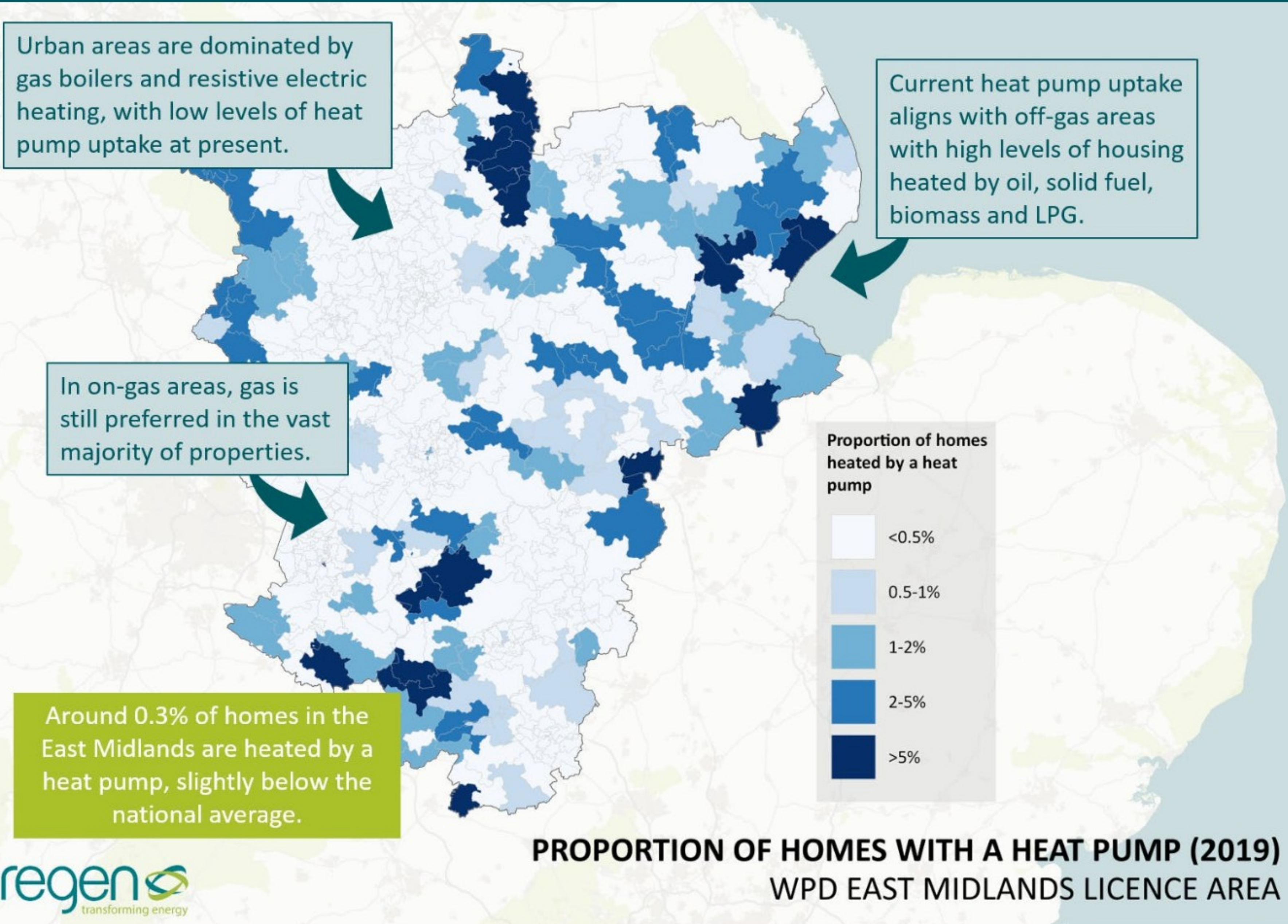


Domestic heat policy context

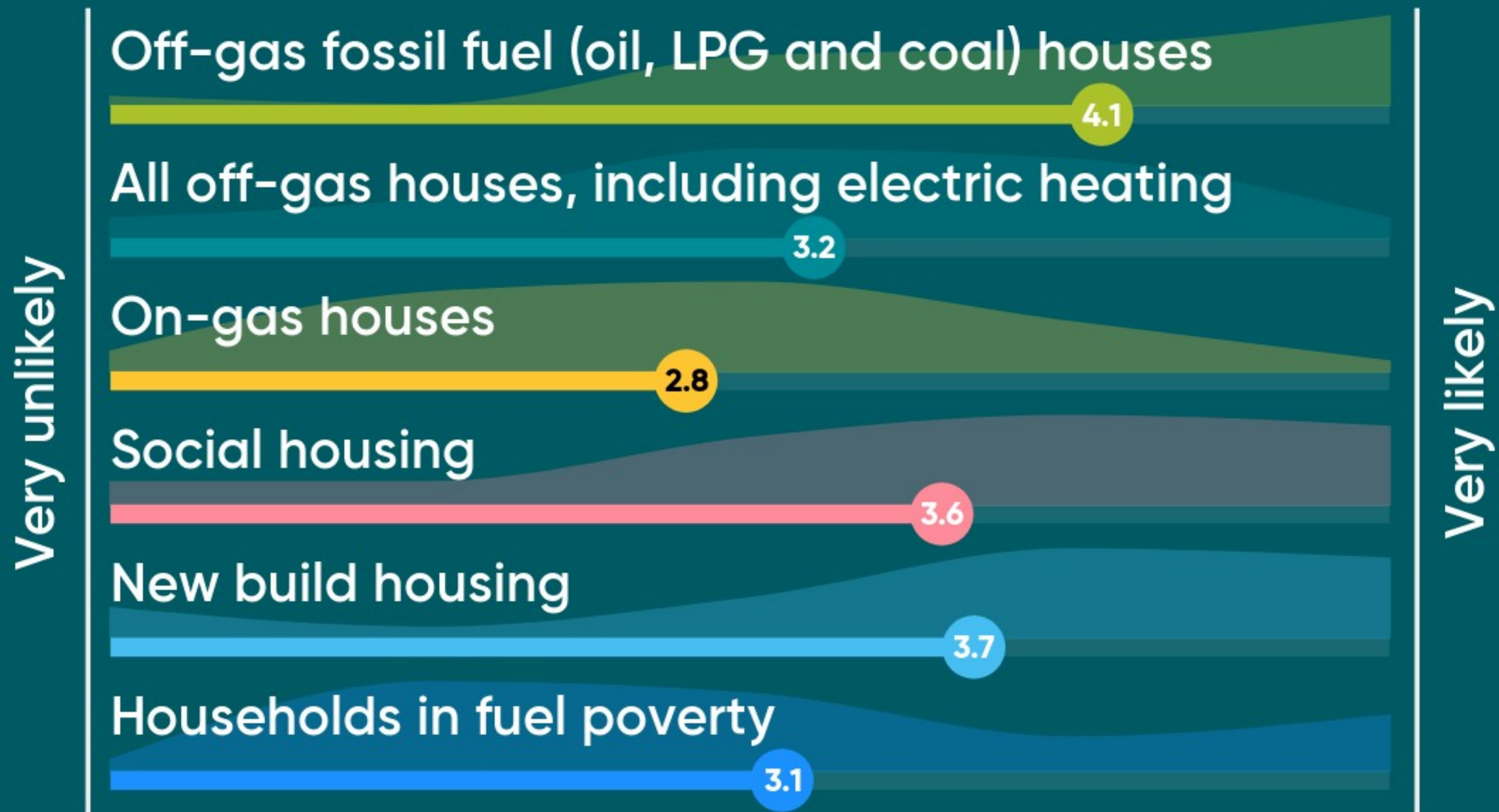


- Government ambition to install 600,000 heat pumps per year by 2028 (currently around 30,000 per year)
- Government ambition to phase out high-carbon fossil heating in off-gas properties in the 2020s
- Future Homes Standard, which will require new build homes to install low carbon heating, expected to be in force from 2025
- Domestic RHI to close in March 2022 (to date has supported 55,000 heat pump installations)
- Clean Heat Grant proposed, but not yet confirmed, to support domestic low carbon heat installations
- Heat and Building Strategy expected from BEIS in the coming months





As the government looks to achieve its target of 600,000 heat pumps installed per year by 2028, which of these areas will be targeted?

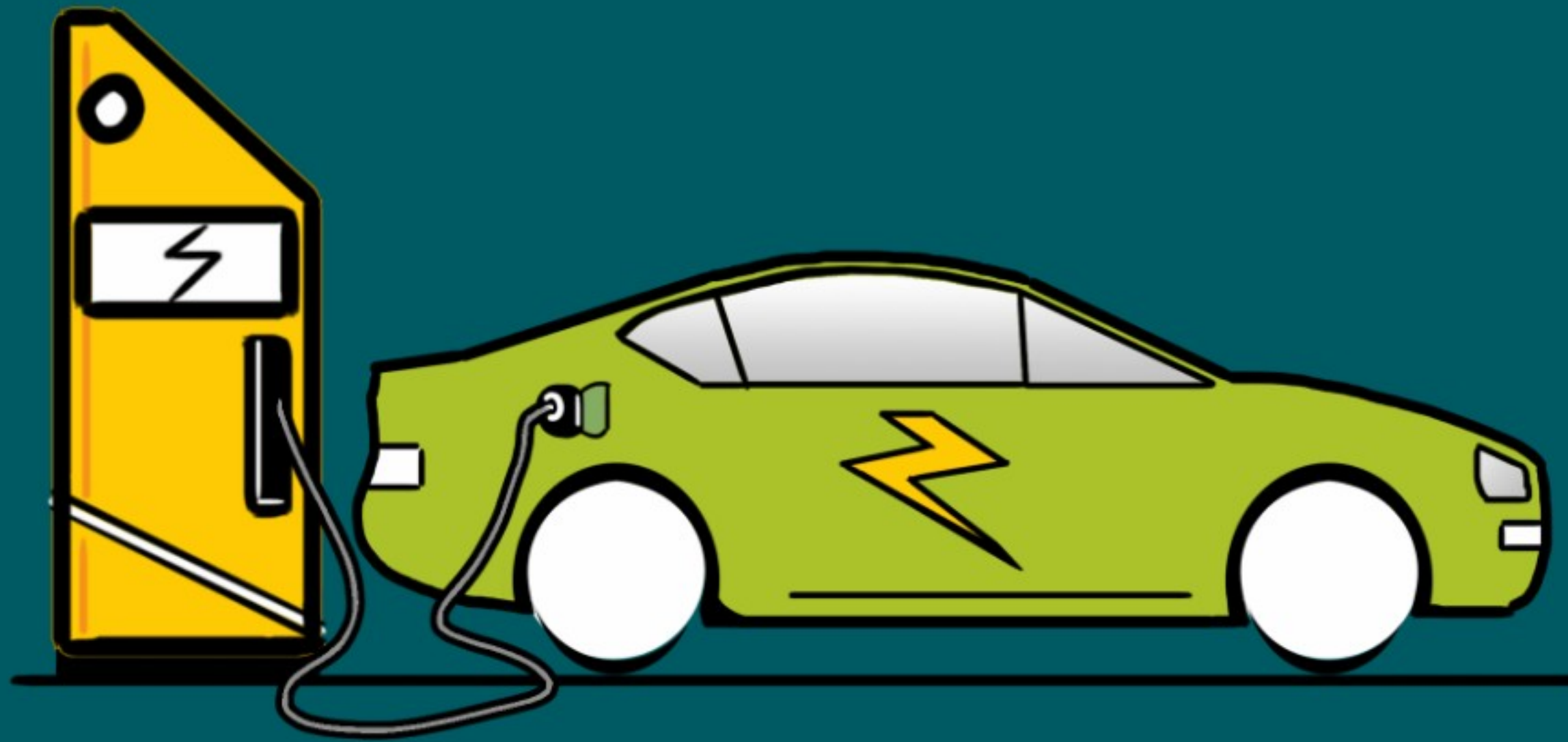


Electric vehicles

→ Jonty Haynes – senior energy analyst, Regen

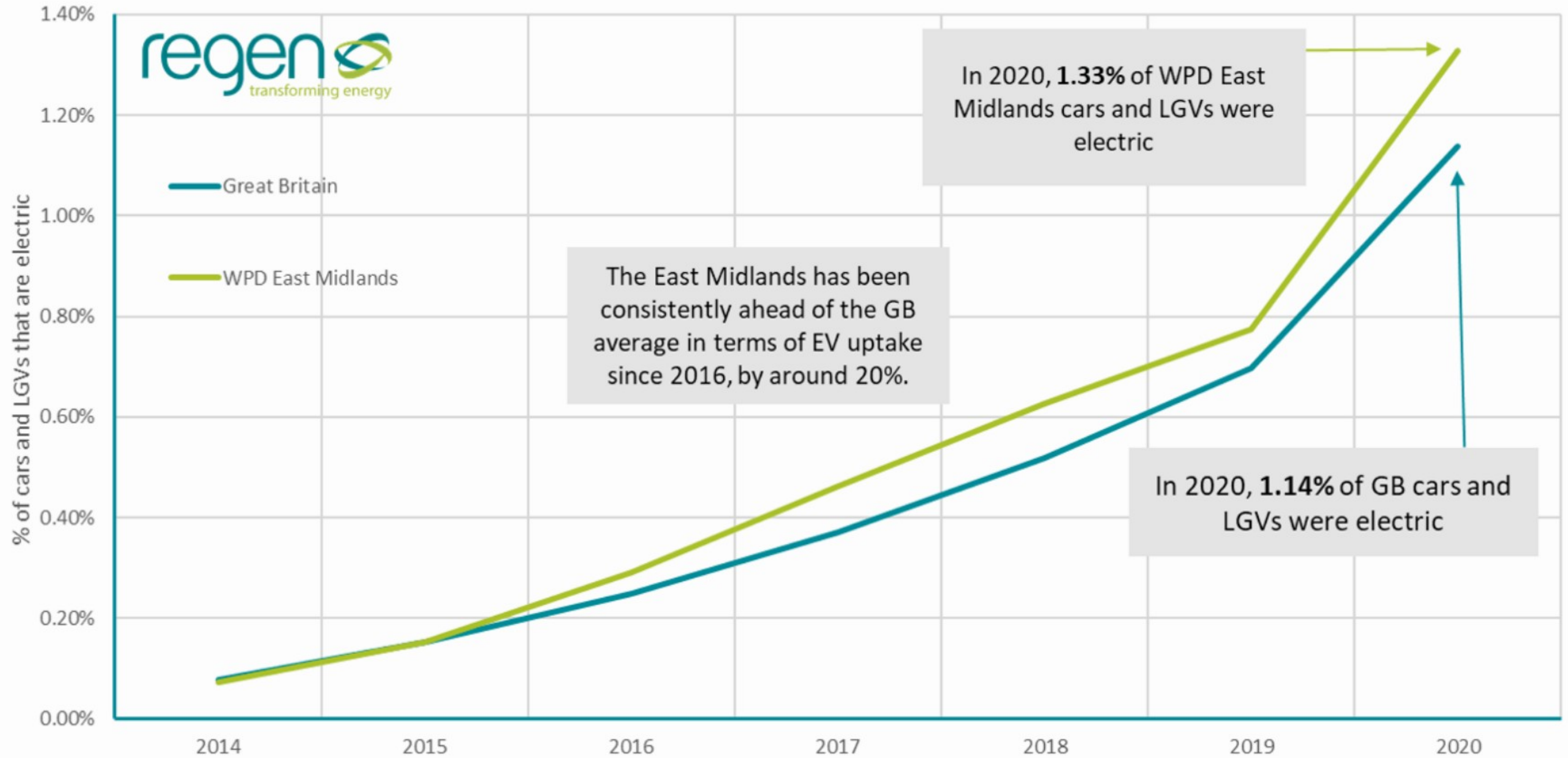


UK policy on EVs and EV chargers



- End of the sale of new petrol/diesel cars and vans from 2030, with plug-in hybrid car and van sales allowed until 2035
- EV sales have increased dramatically since the start of the COVID-19 pandemic, with a more affordable second hand market also emerging
- Proposed changes to building regulations to increase the proportion of new and existing developments with chargepoints
- Installation of a national network of ultra-rapid charging hubs at motorway service areas

Proportion of cars and LGVs that are electric - GB vs WPD South Wales



In 2020, **1.33%** of WPD East Midlands cars and LGVs were electric

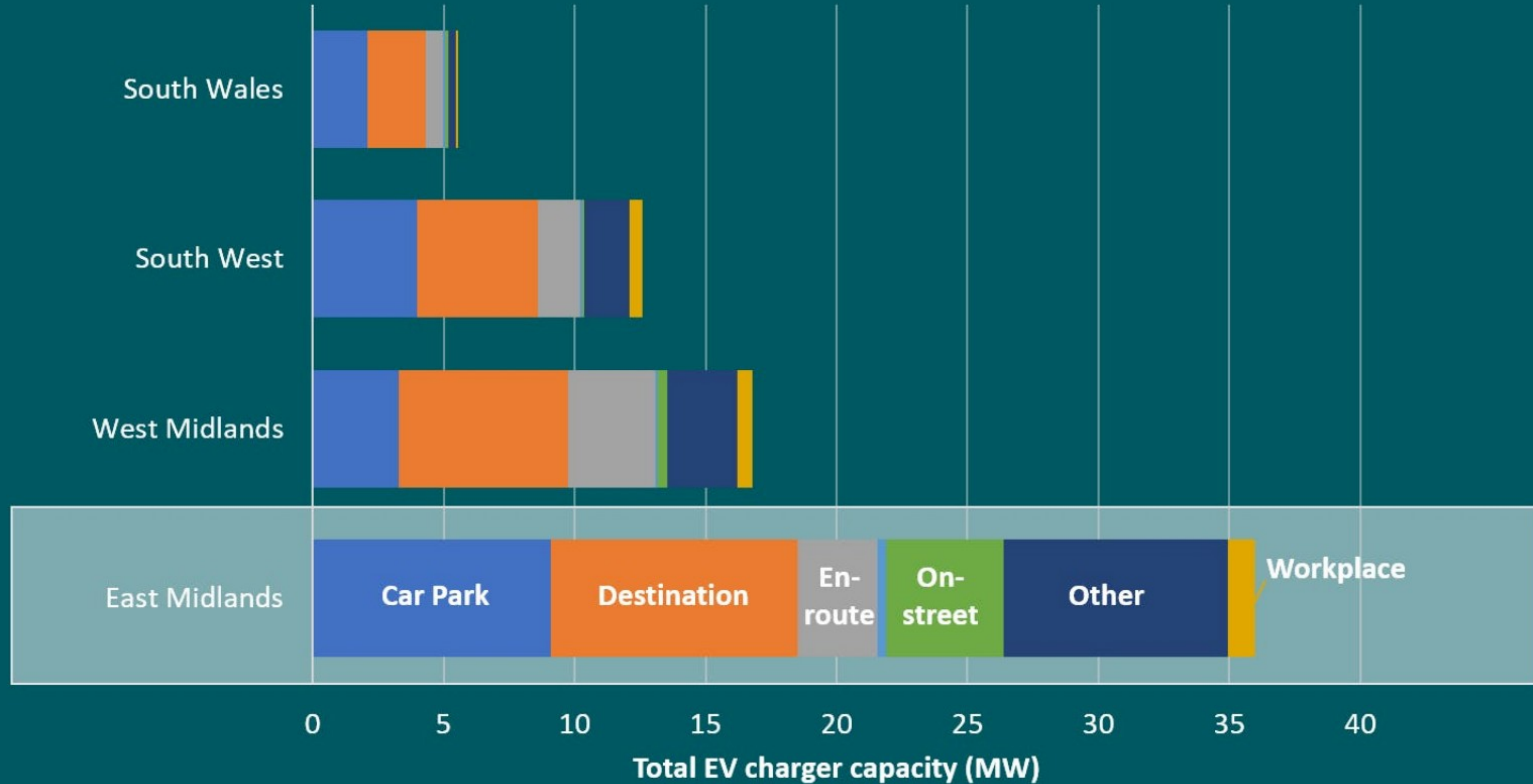
The East Midlands has been consistently ahead of the GB average in terms of EV uptake since 2016, by around 20%.

In 2020, **1.14%** of GB cars and LGVs were electric

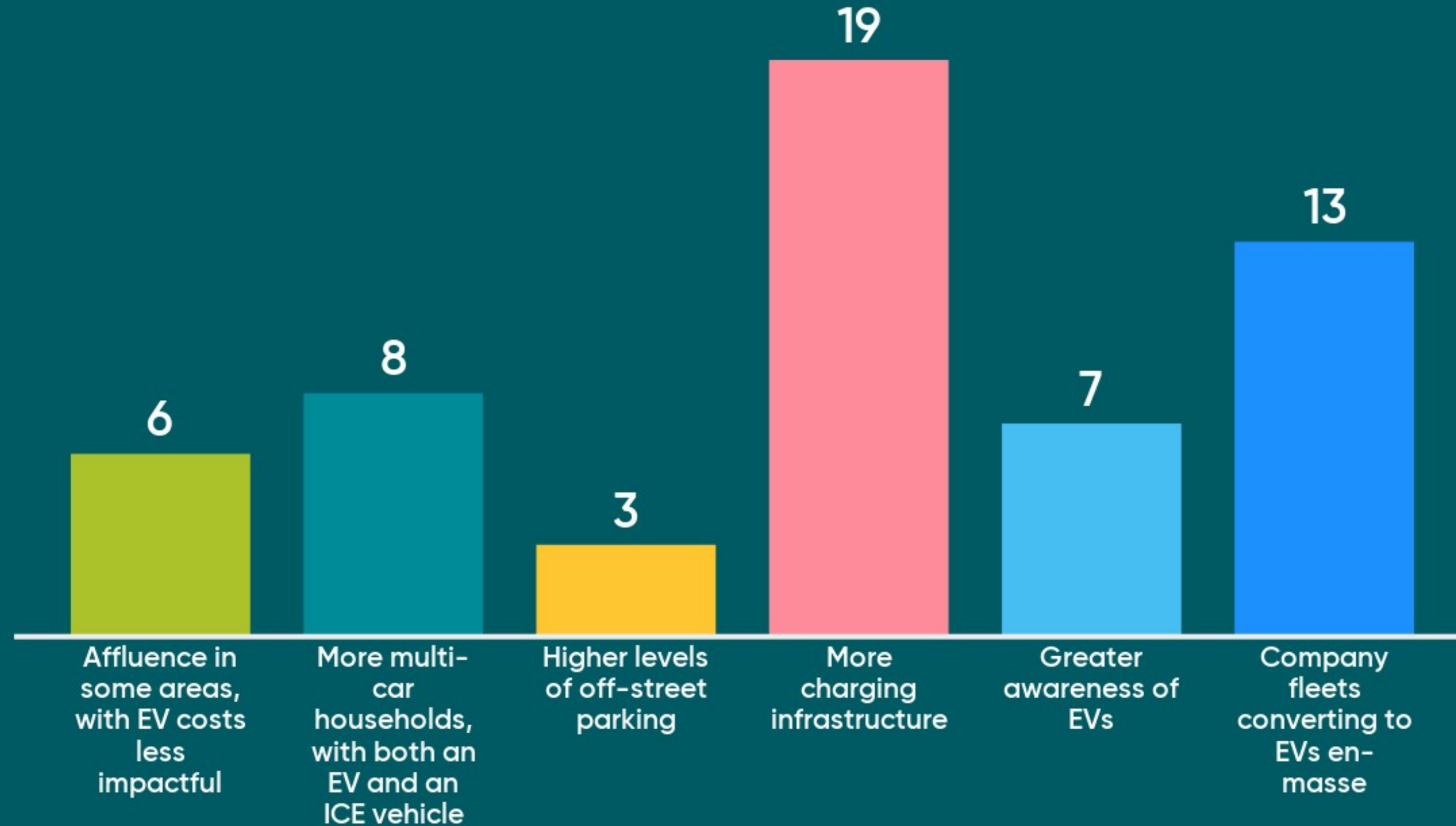


EV charging capacity by location type in WPD's licence areas

Source: National Chargepoint Registry



Why might the East Midlands' current uptake of EVs be ahead of the national rate?



New developments study

- Contacting every local authority in the area
- Covering new housing and new business land
- Many technologies are influenced by new housing, such as heat pumps and EV chargers
- Also want to find out about local low carbon heat strategies, transport strategies, climate emergency declarations etc.

What impact will local climate emergency declarations have in the coming decade?



Zoning for low carbon heat options, including increased interest in heat networks



Increasing EV charging infrastructure



Electrification of public transport, such as buses



Designation of zones for renewable energy



Refusal of planning permission for projects incompatible with net zero



Increased standards for housing developments, such as zero carbon homes, EV charging, rooftop solar etc.

Further questions and Q+A

- Jonty Haynes - senior energy analyst, Regen
- Oli Spink - network strategy engineer, WPD
- Grace Millman - energy analyst, Regen



How has the energy system and people's use of energy shifted as a result of the COVID-19 pandemic?

Is there anything else you'd like to highlight for our analysis?

Did you find the event today...

Clear?

Interesting?

Useful?

