

Distribution Future Energy Scenarios Stakeholder Consultation Event

WPD West Midlands licence area
Tuesday 29 June 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

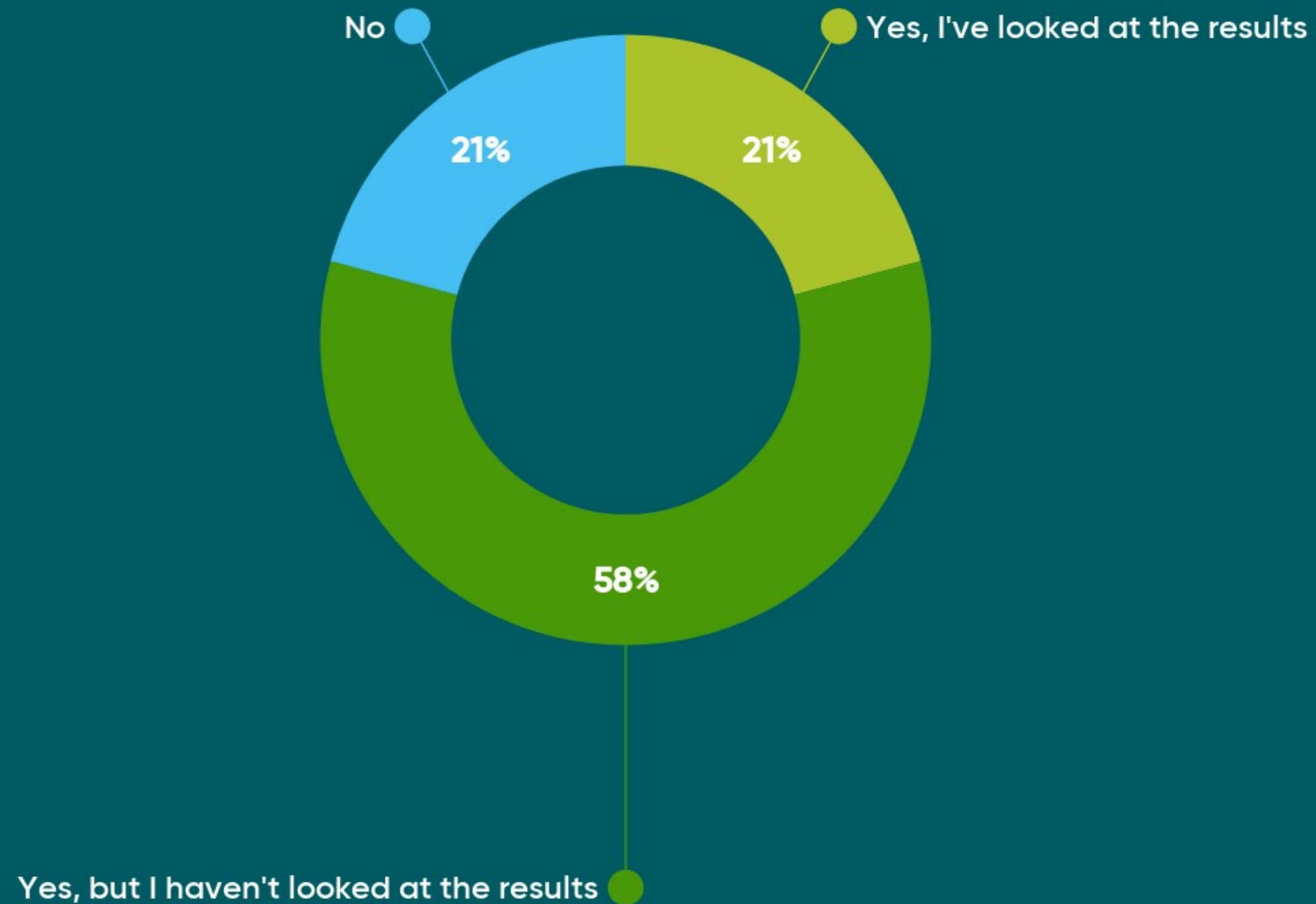
- WPD - Network strategy for net zero future energy scenarios
- Regen - Modelling the 2021 distribution future energy scenarios
- Q&A



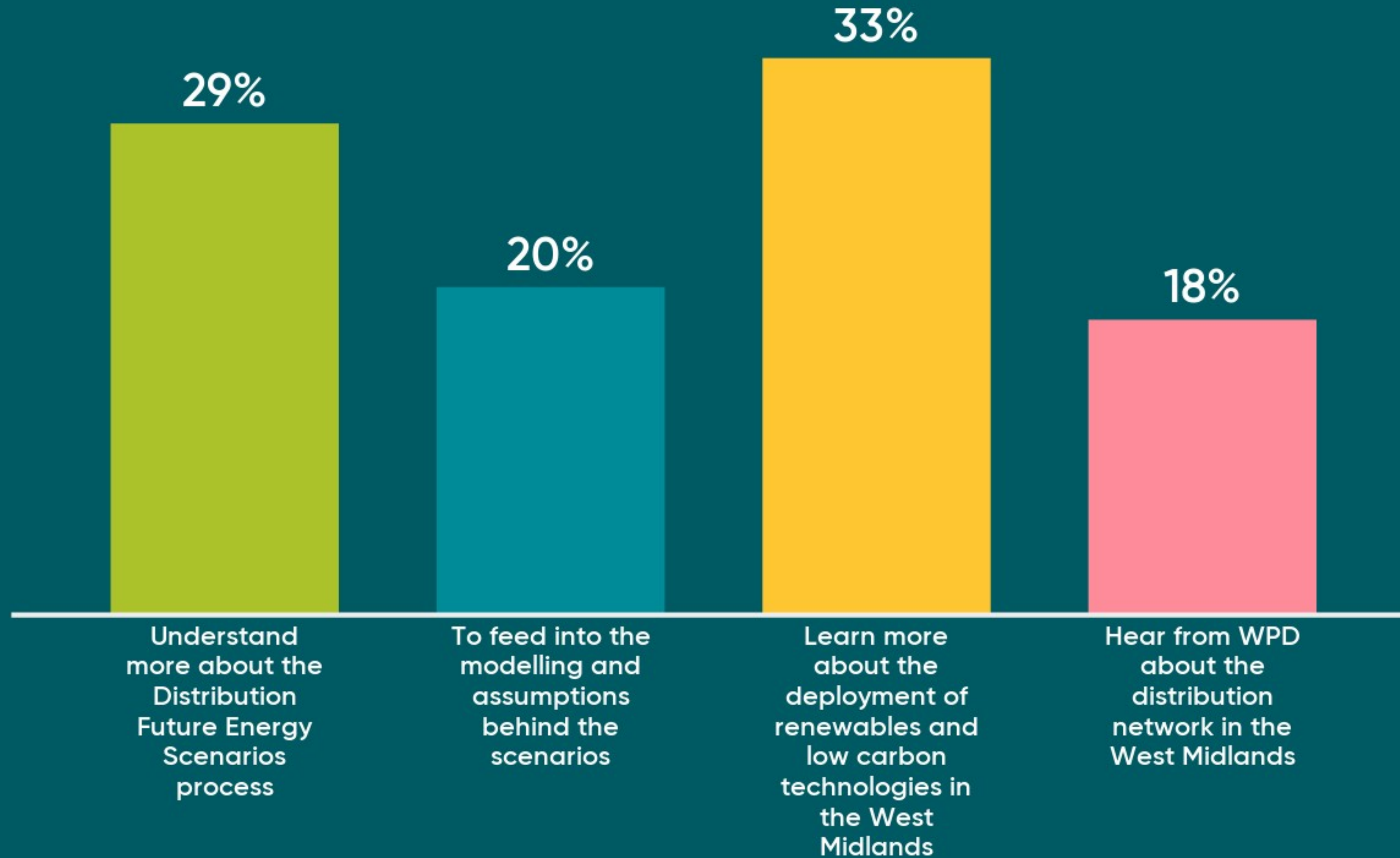
The key role of stakeholders

- 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?



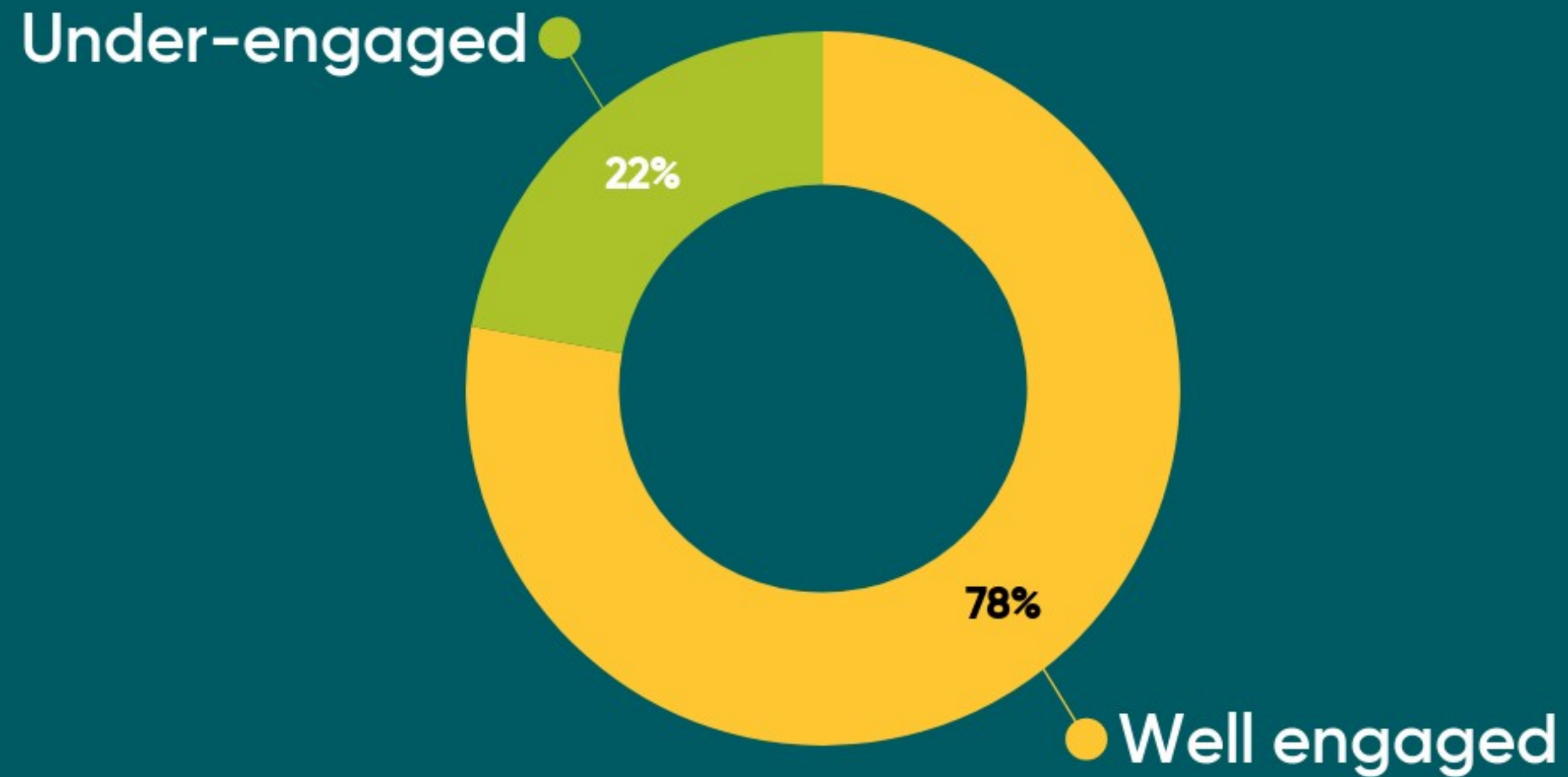
What do you want to get out of today?



WPD – Network strategy for net zero future energy scenarios

→ Ben Godfrey – DSO manager, 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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Regen's role in Distribution Network Future Energy Scenarios (DFES)

- 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

West Midlands licence area context and analysis input

- Jonty Haynes – Senior energy analyst, Regen
- Grace Millman – Energy analyst, Regen





WPD West Midlands licence area vs West Midlands region



Renewable generation

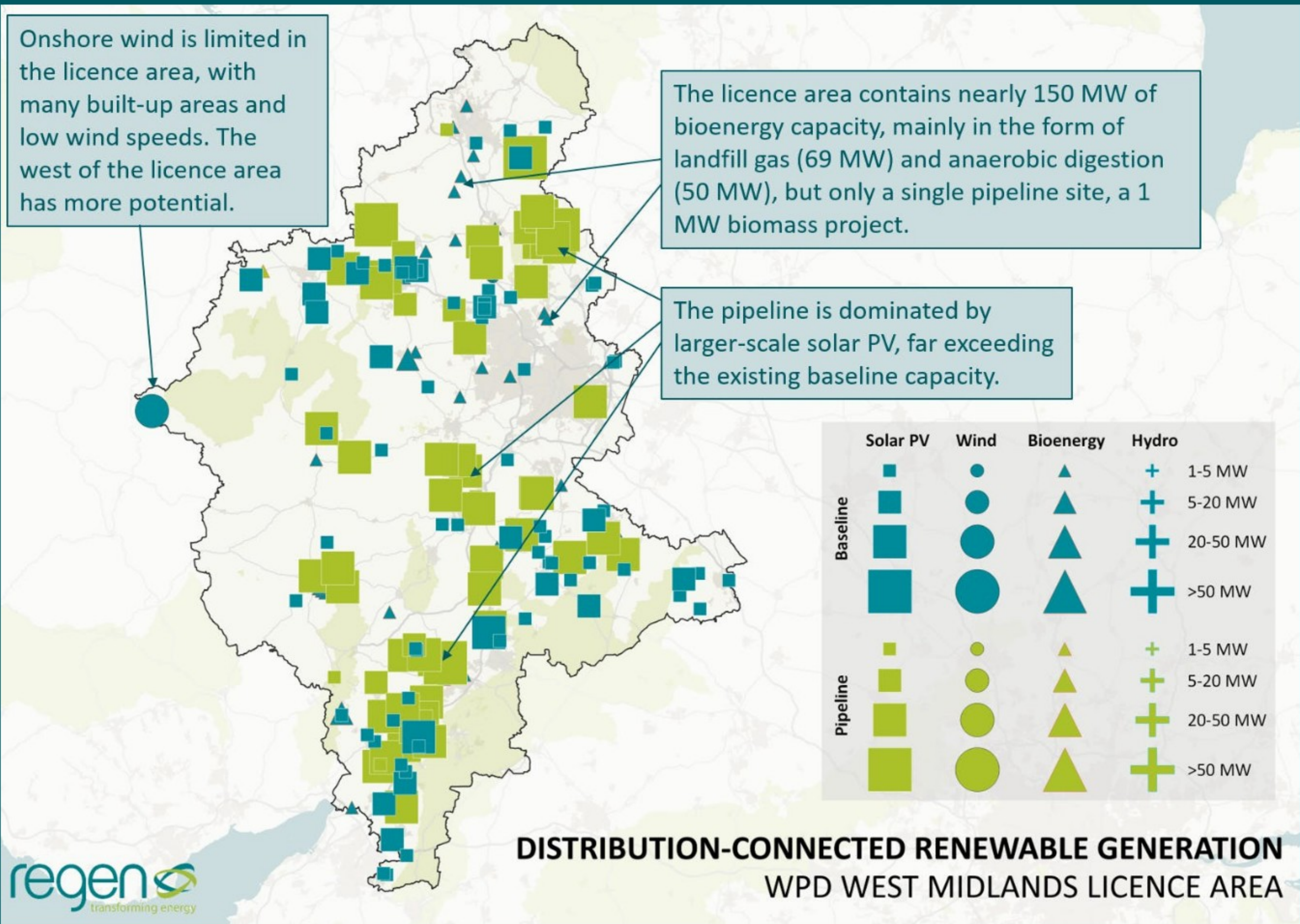
→ Jonty Haynes - Senior energy analyst, Regen



Onshore wind is limited in the licence area, with many built-up areas and low wind speeds. The west of the licence area has more potential.

The licence area contains nearly 150 MW of bioenergy capacity, mainly in the form of landfill gas (69 MW) and anaerobic digestion (50 MW), but only a single pipeline site, a 1 MW biomass project.

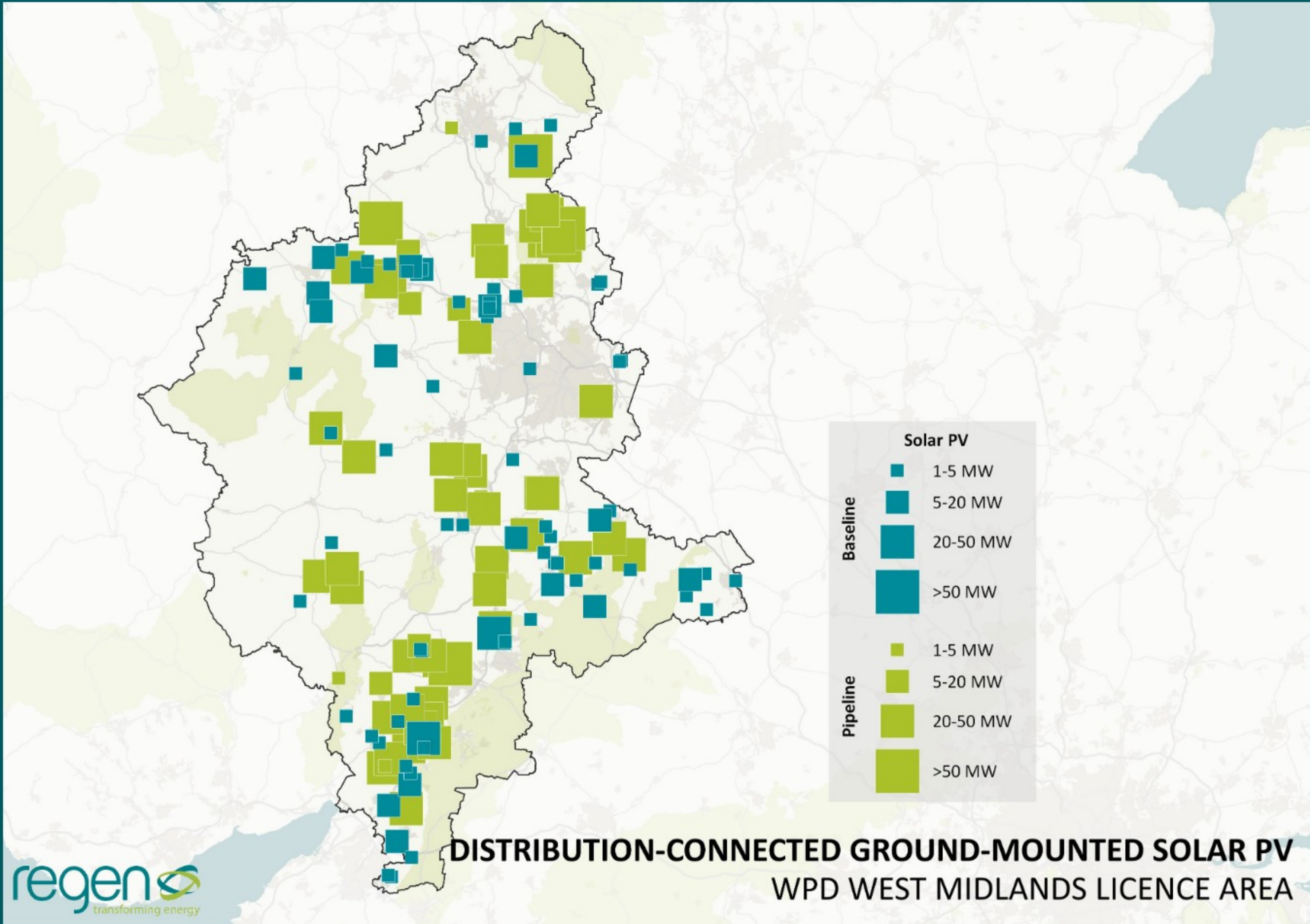
The pipeline is dominated by larger-scale solar PV, far exceeding the existing baseline capacity.



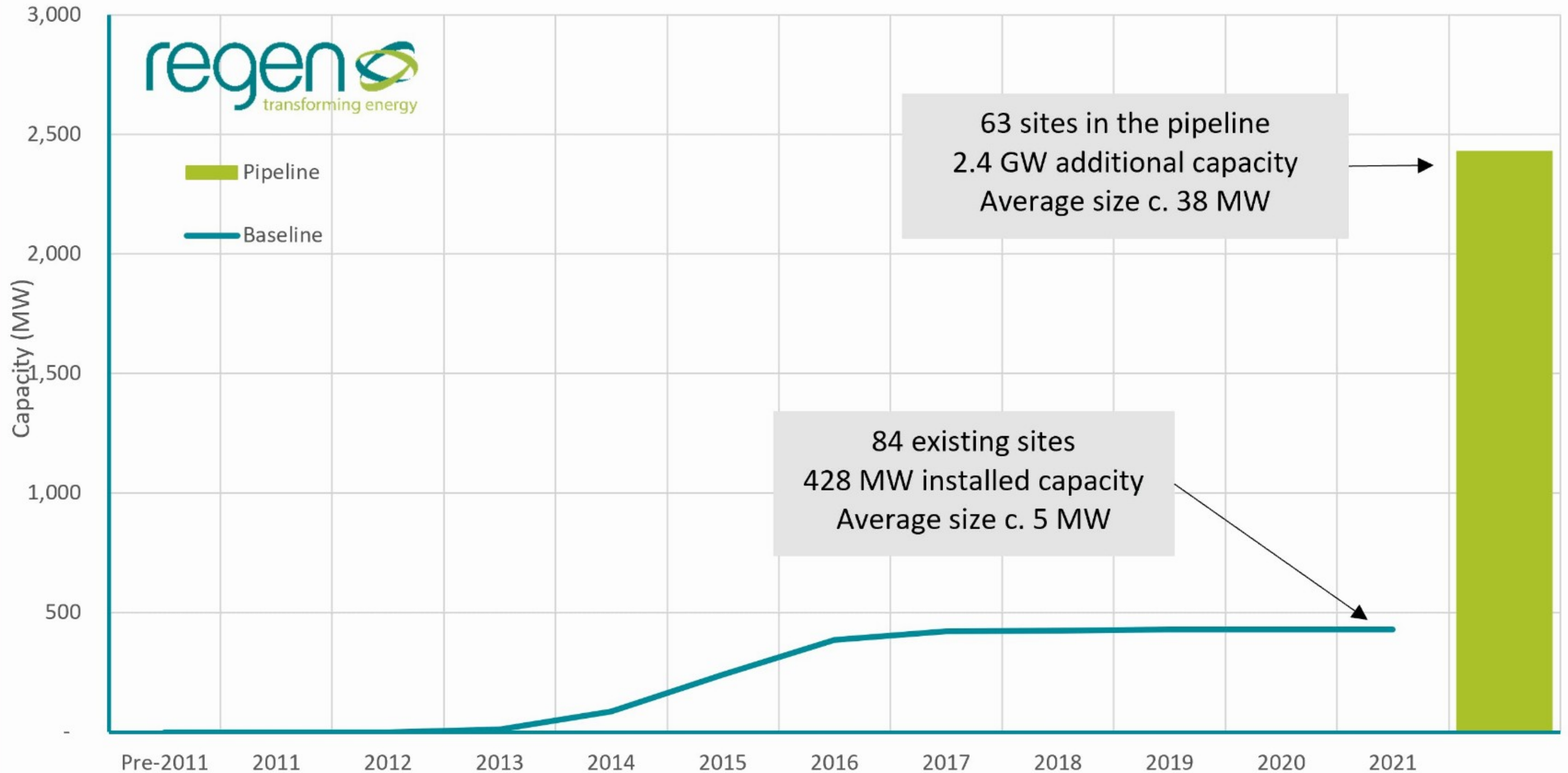
	Solar PV	Wind	Bioenergy	Hydro	
Baseline					1-5 MW
					5-20 MW
					20-50 MW
					>50 MW
Pipeline					1-5 MW
					5-20 MW
					20-50 MW
					>50 MW

DISTRIBUTION-CONNECTED RENEWABLE GENERATION
WPD WEST MIDLANDS LICENCE AREA

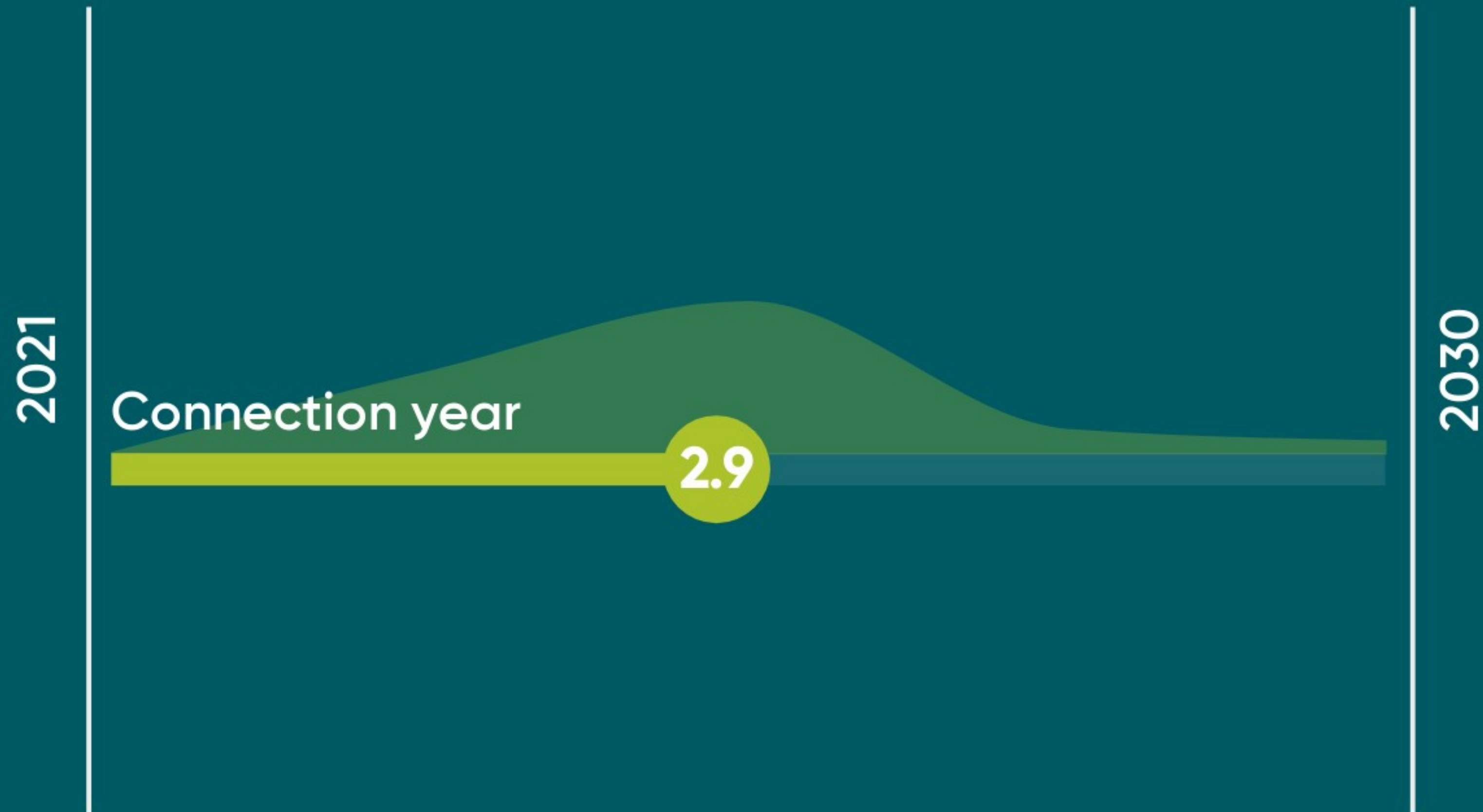




Large scale solar PV capacity in the West Midlands licence area



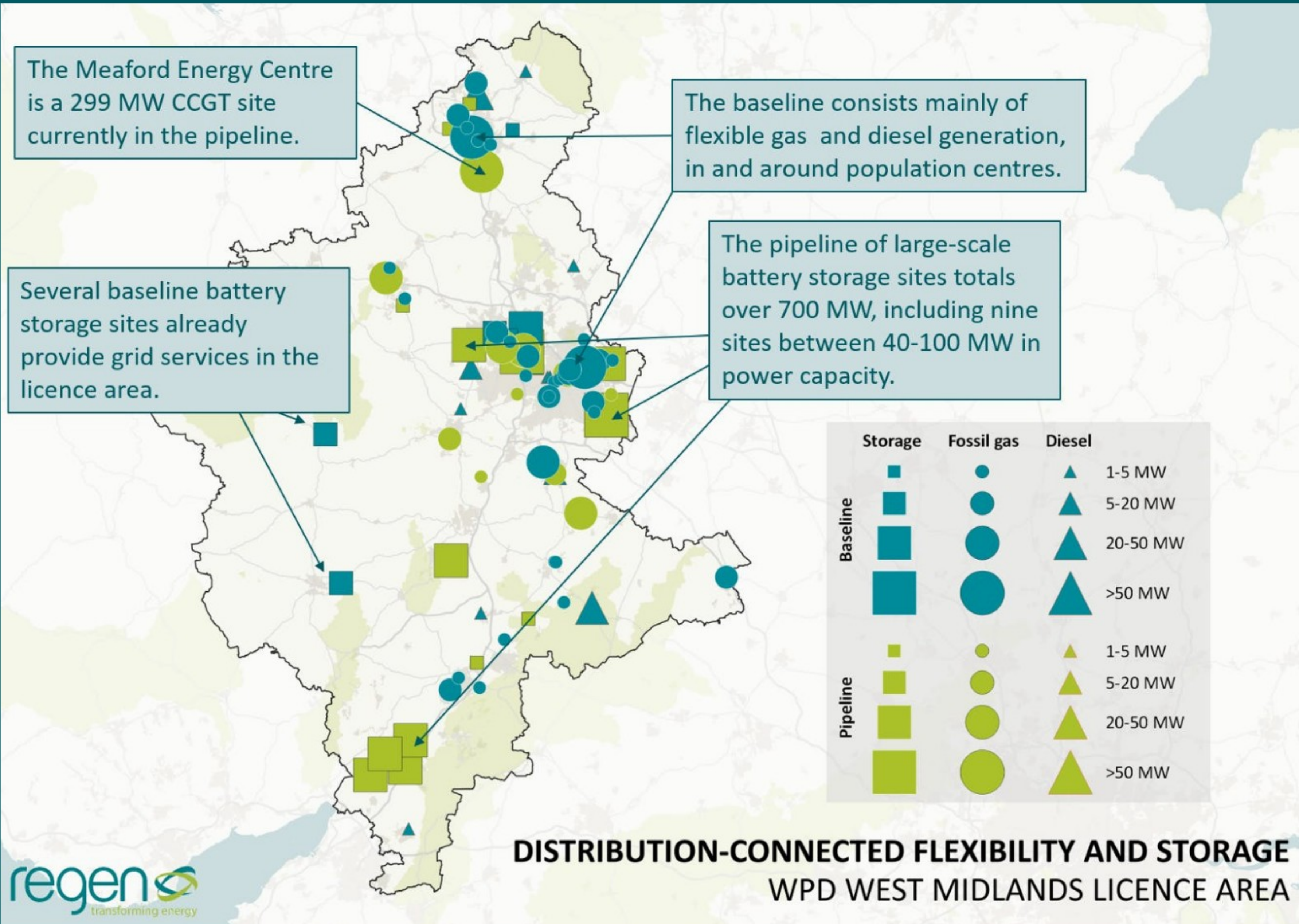
When will the large-scale solar pipeline start connecting in the West Midlands?

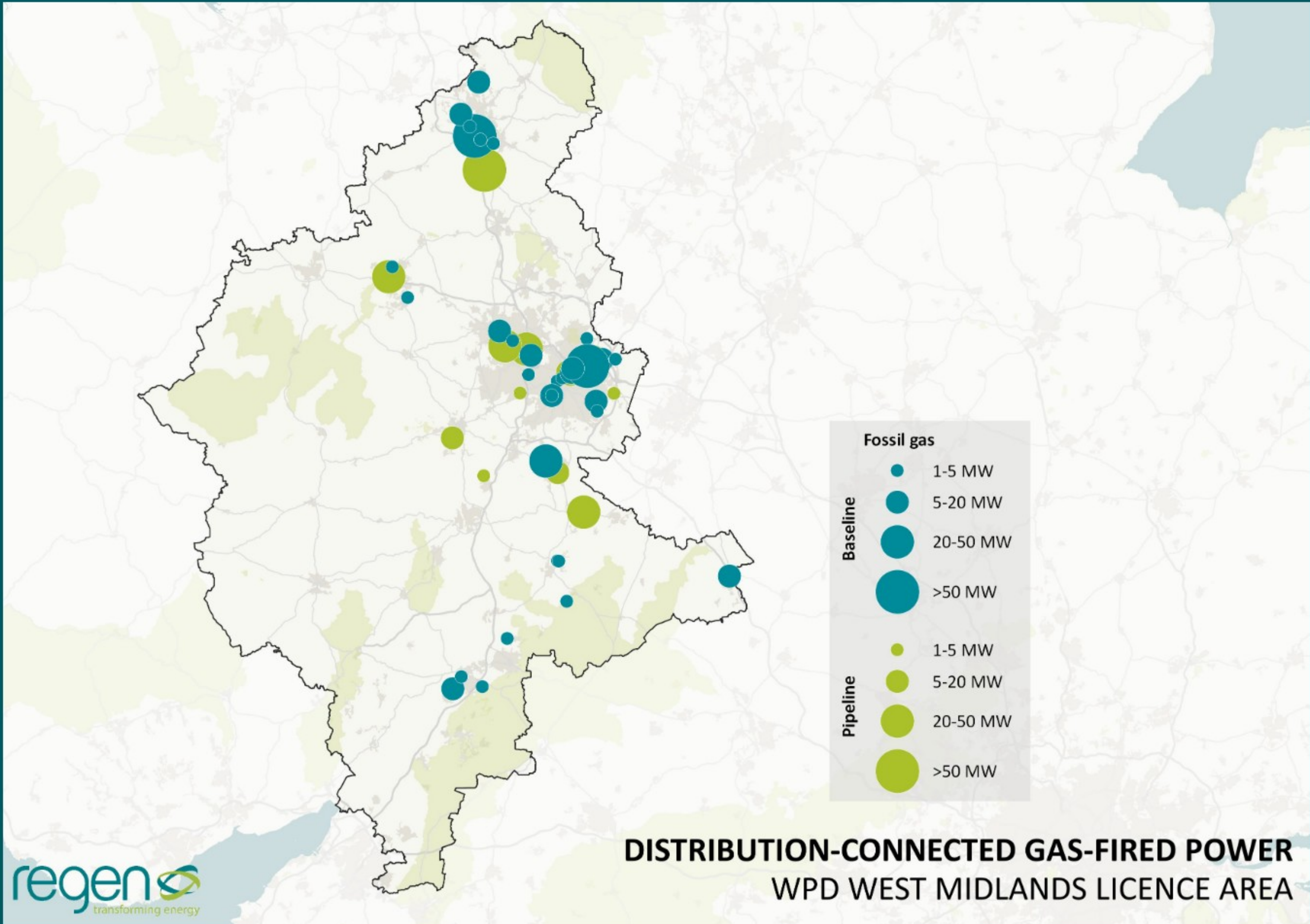


Flexibility and storage

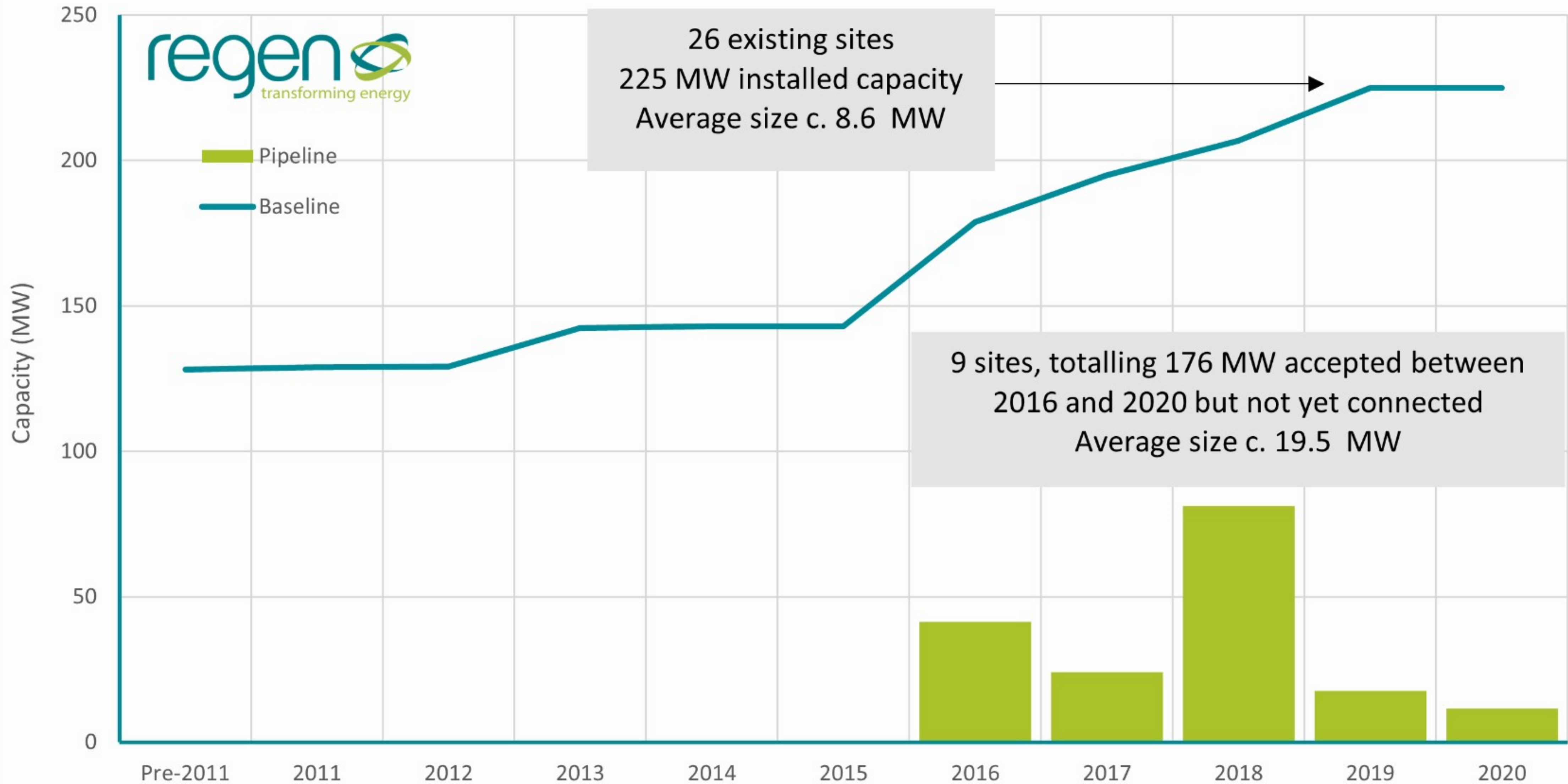
→ Grace Millman - Energy analyst, Regen



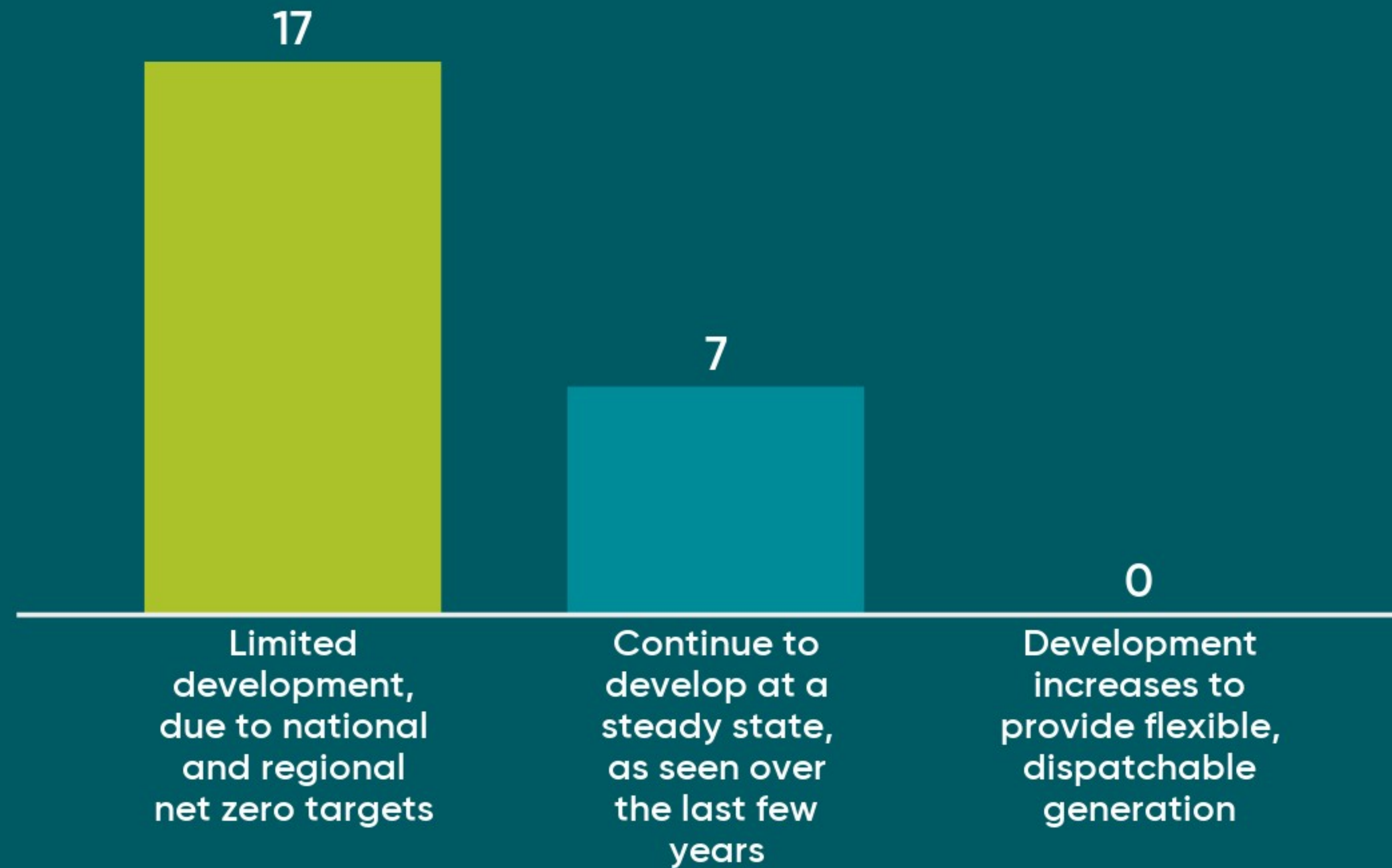




Fossil gas generation capacity in the West Midlands licence area



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



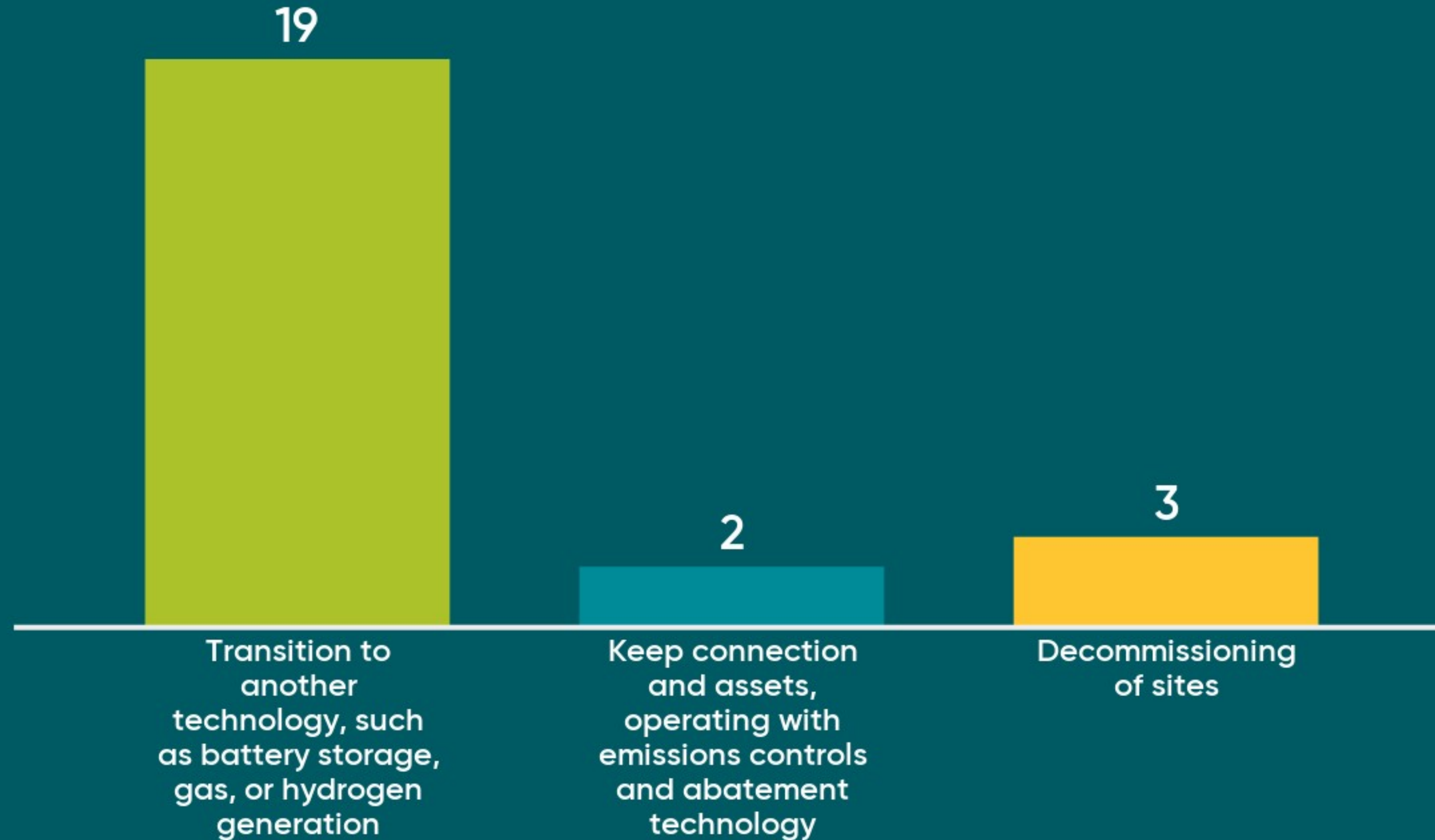
Diesel generation

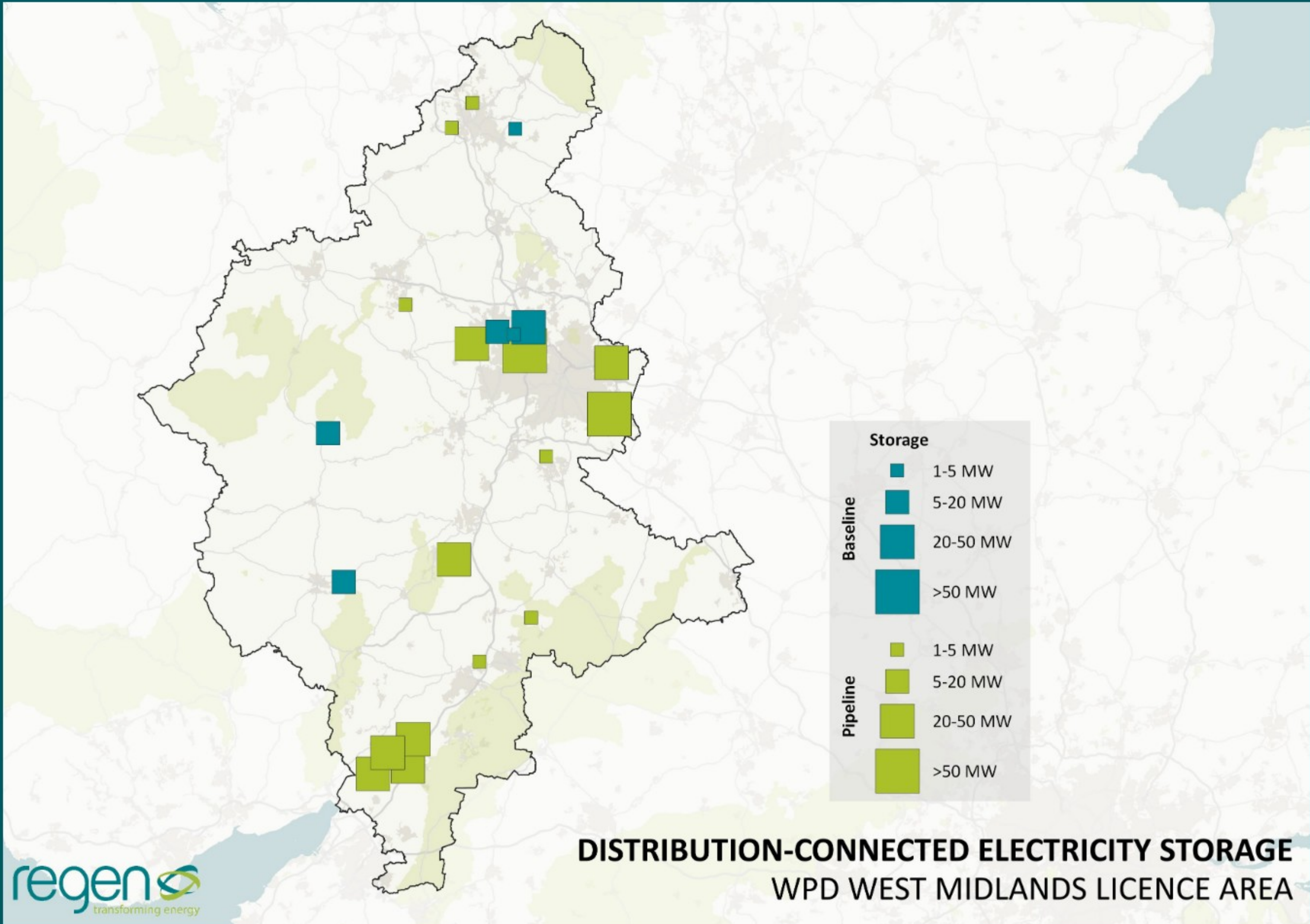
There are stringent environmental permitting regulations and ambitious emission reduction targets around commercial medium-scale diesel generators.

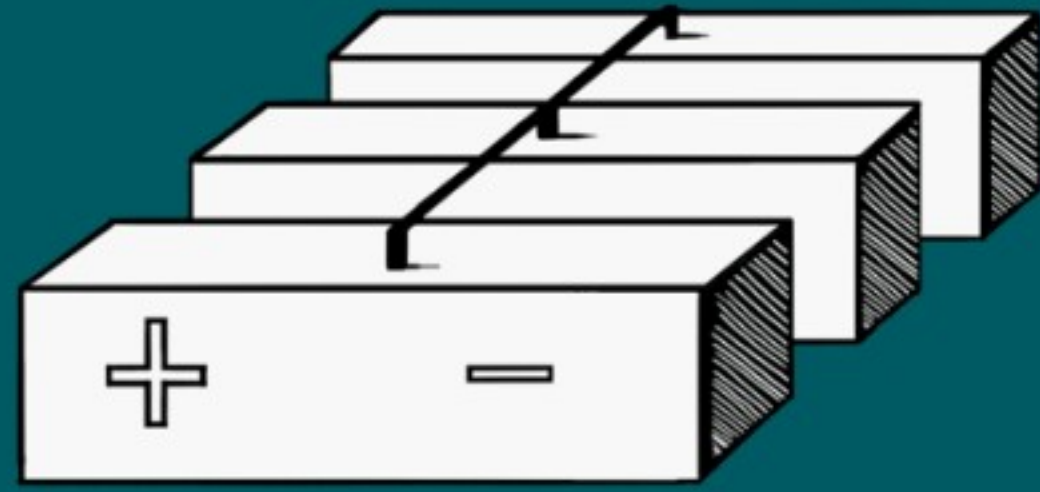
In particular, the permitting regulations and air quality requirements under the Medium Combustion Plant Directive (MCPD) have been passed into UK law.



What will happen to current commercial medium-scale diesel generation sites that are impacted by the MCPD?







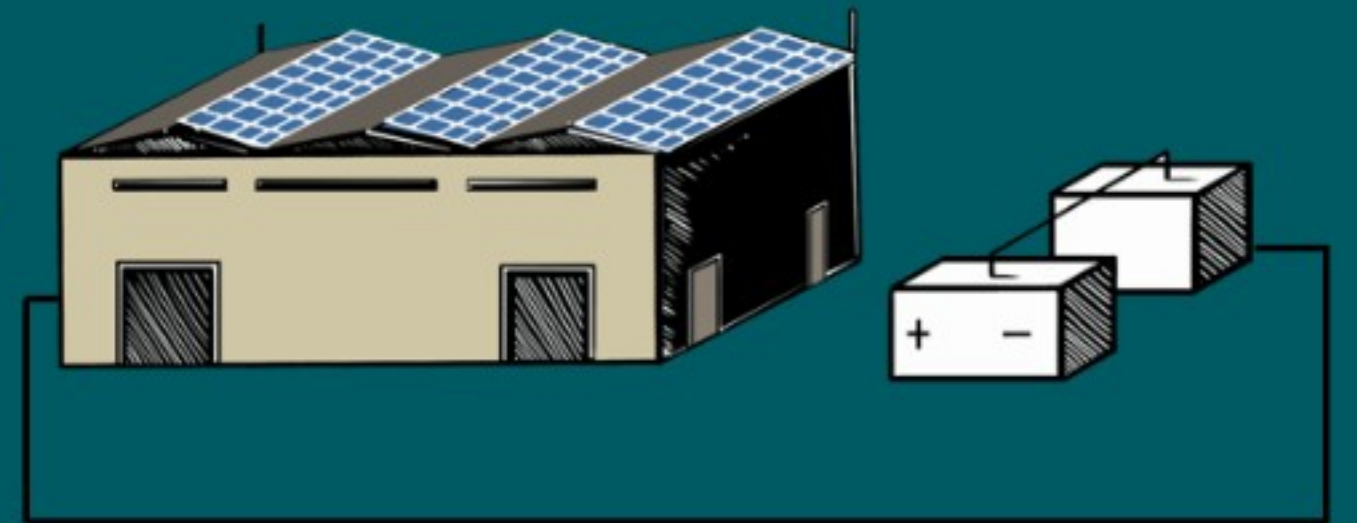
Standalone network services

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



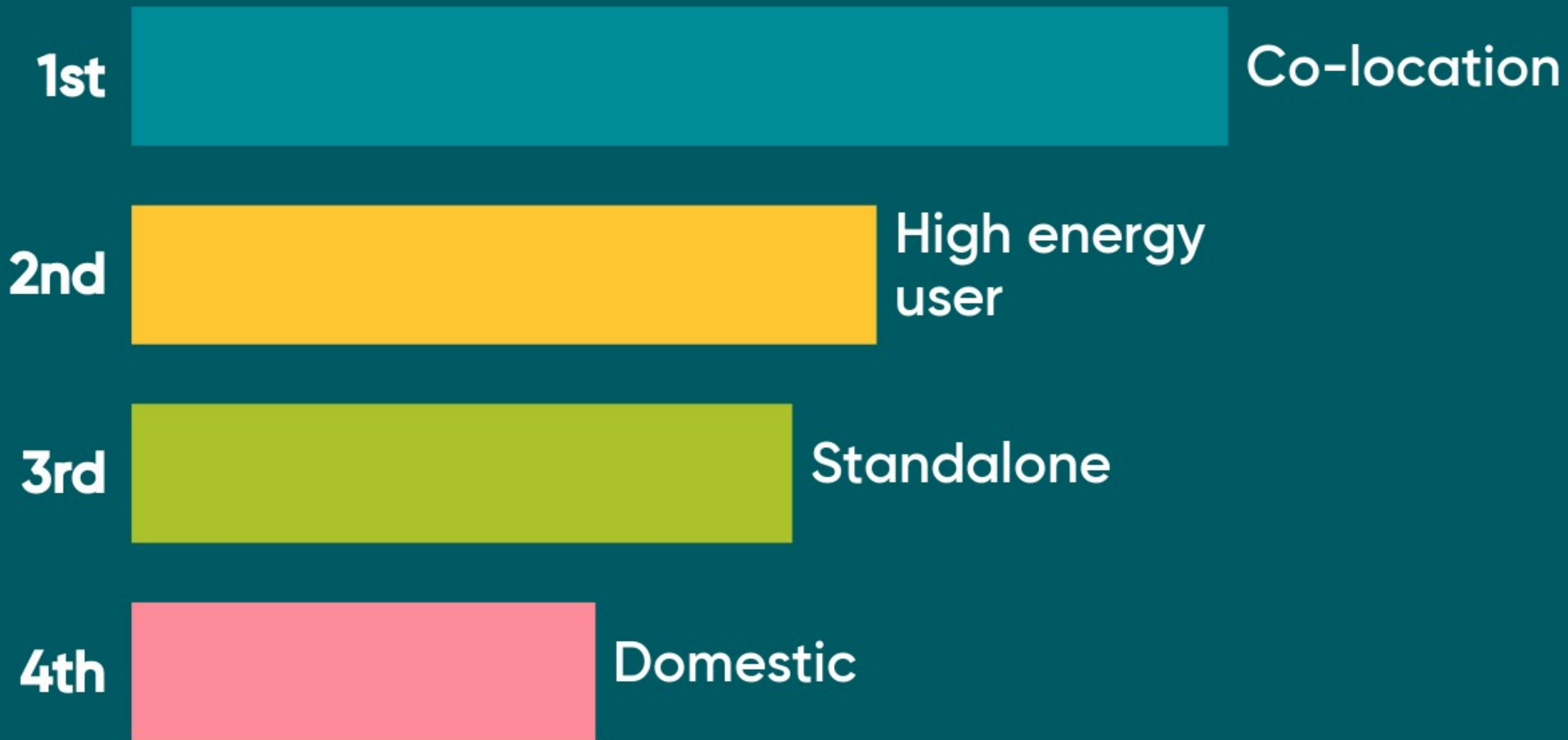
Domestic

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

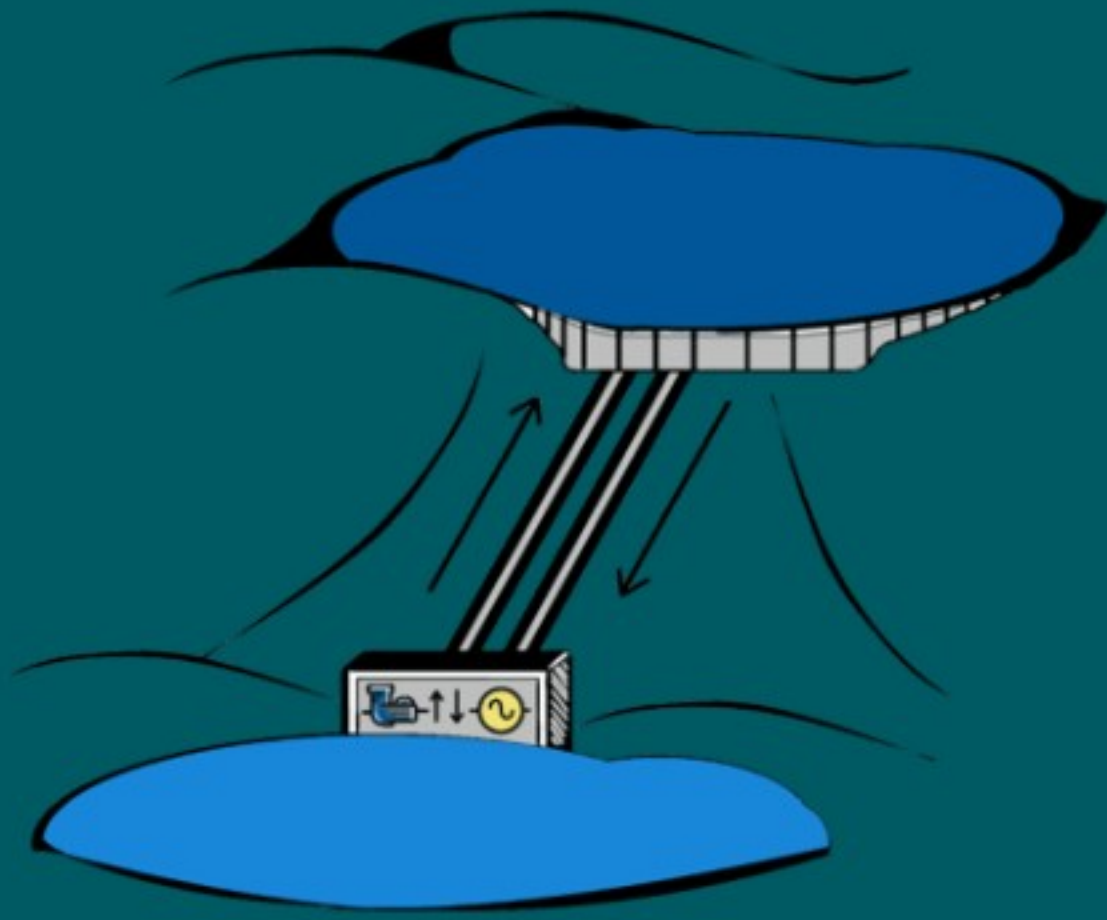
Electricity storage business models



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



Pumped hydro

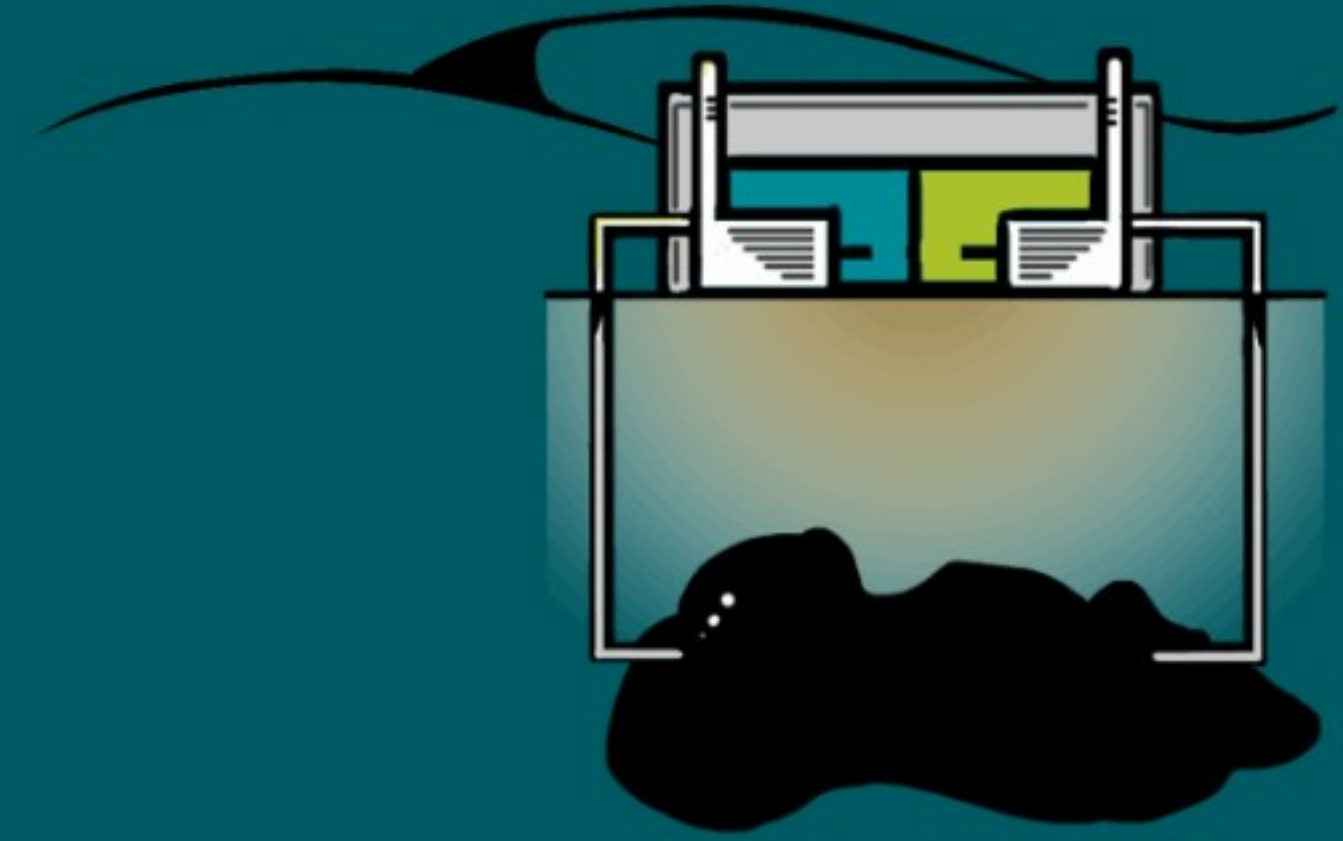


Flywheels

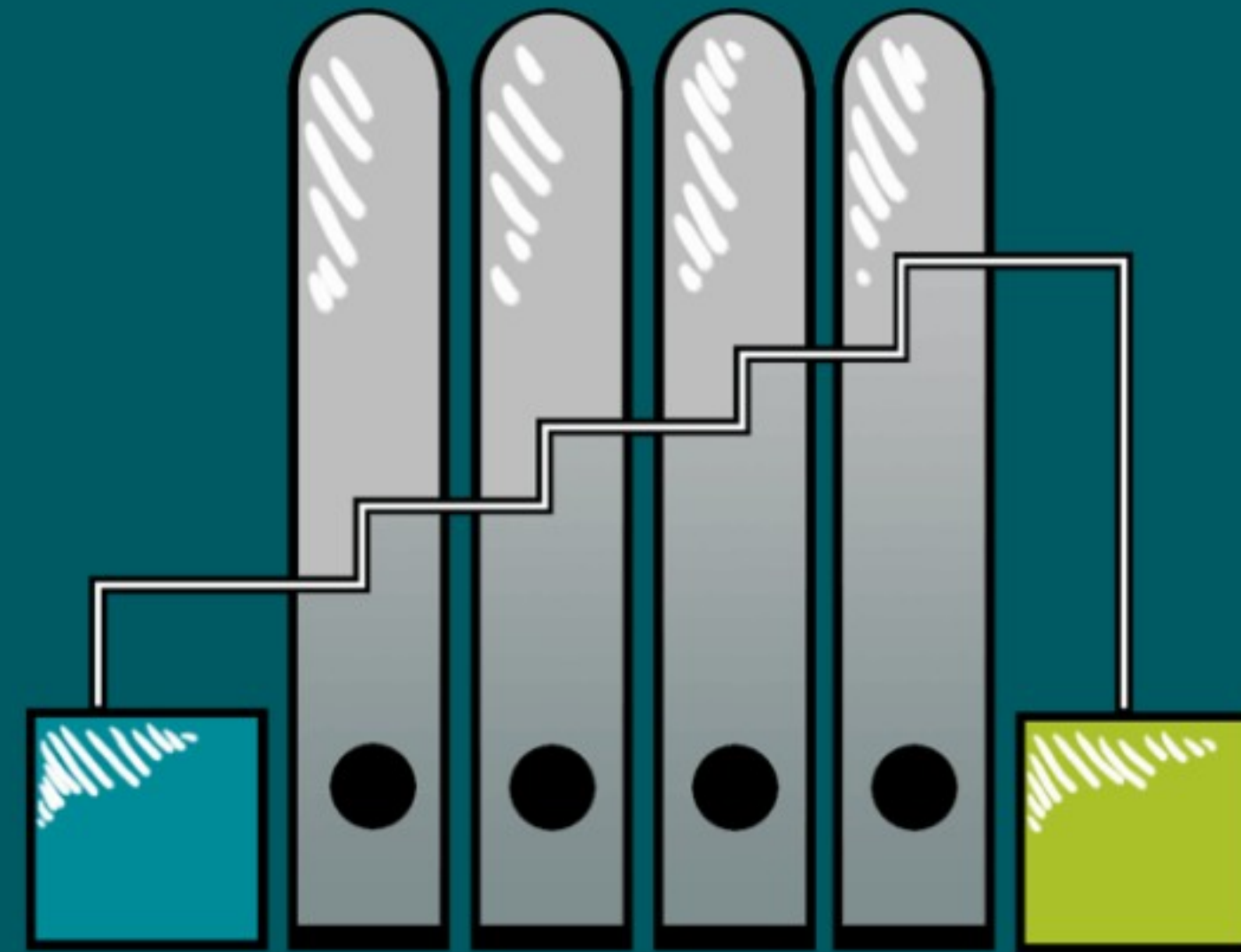
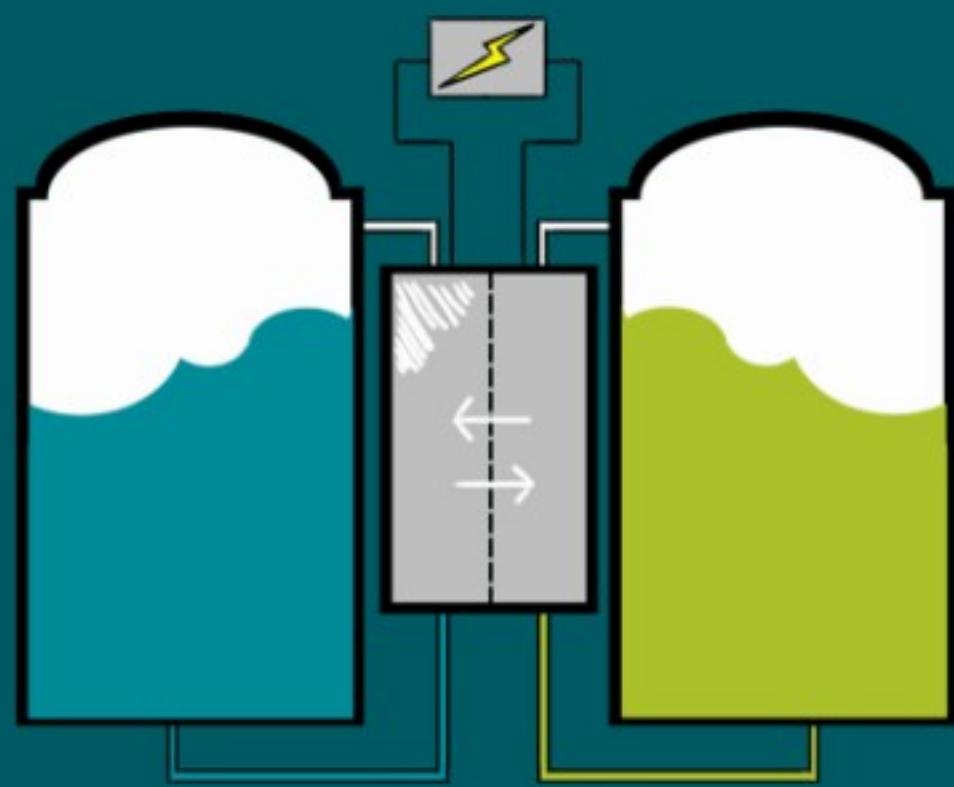


Liquid air

Compressed air



Flow batteries

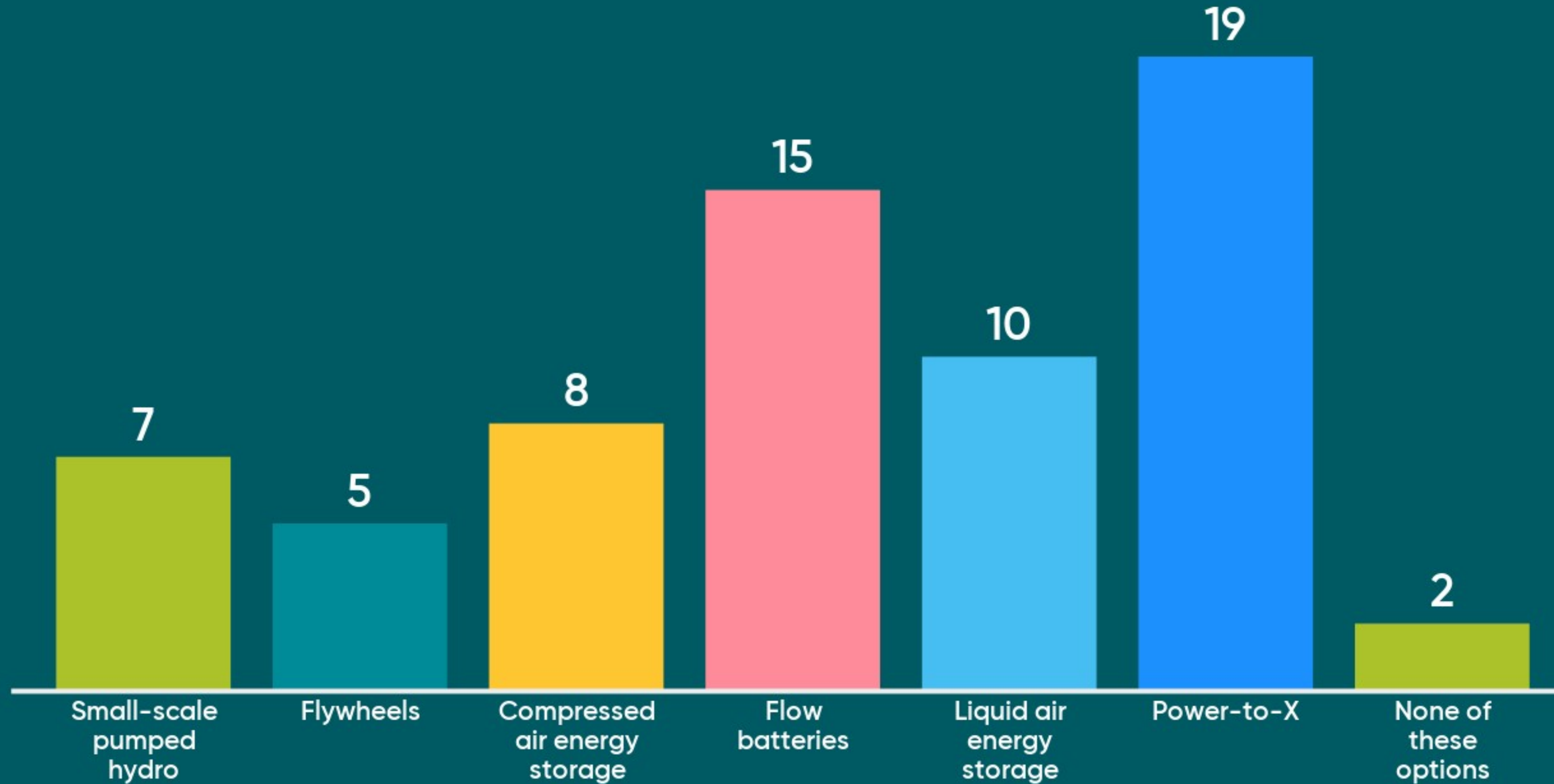


Power-to-X



Alternative energy storage technologies

Which alternative storage technologies could see deployment on the distribution network in the future?



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

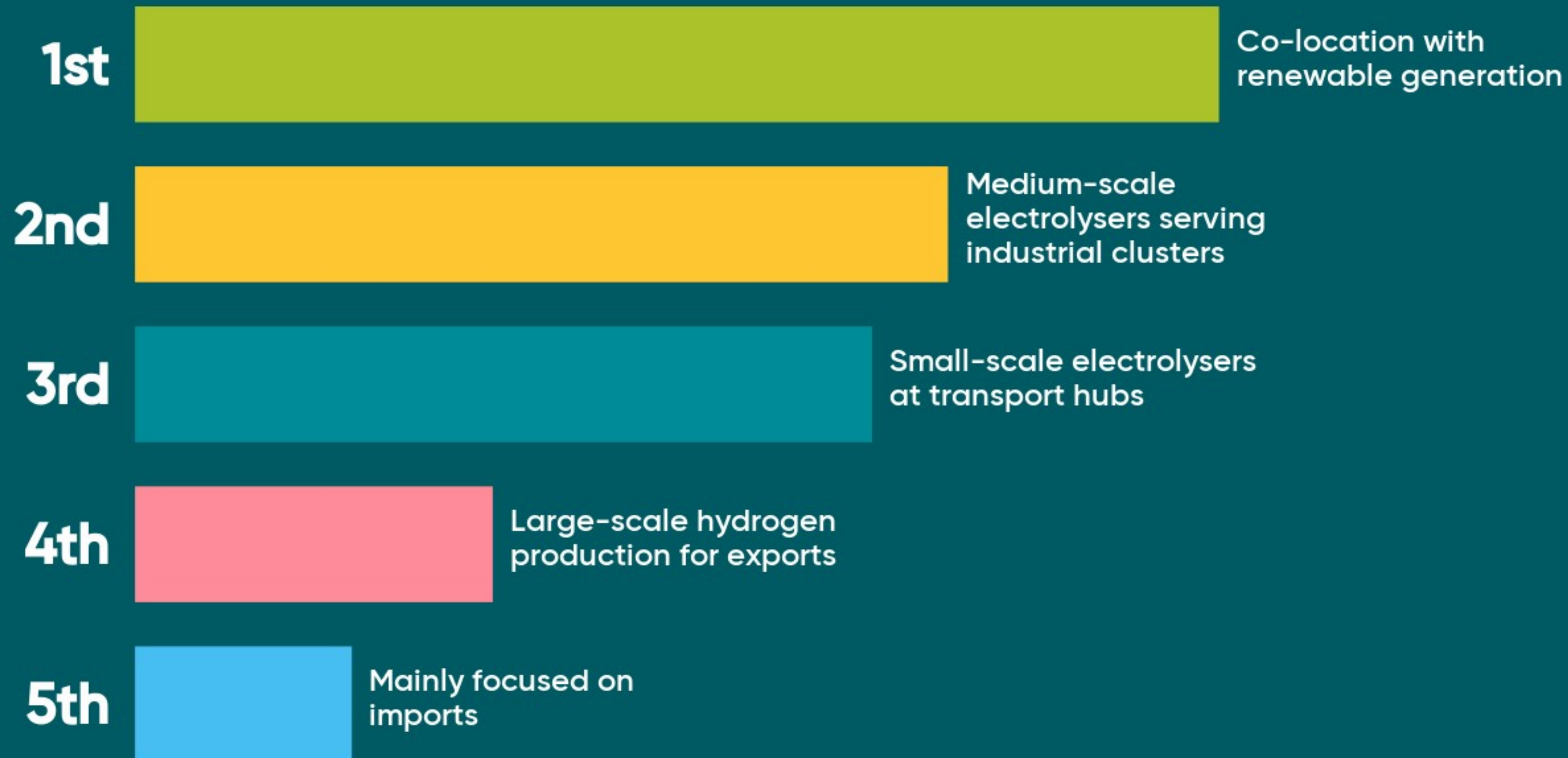


Heating homes and businesses

Potential uses of green hydrogen



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

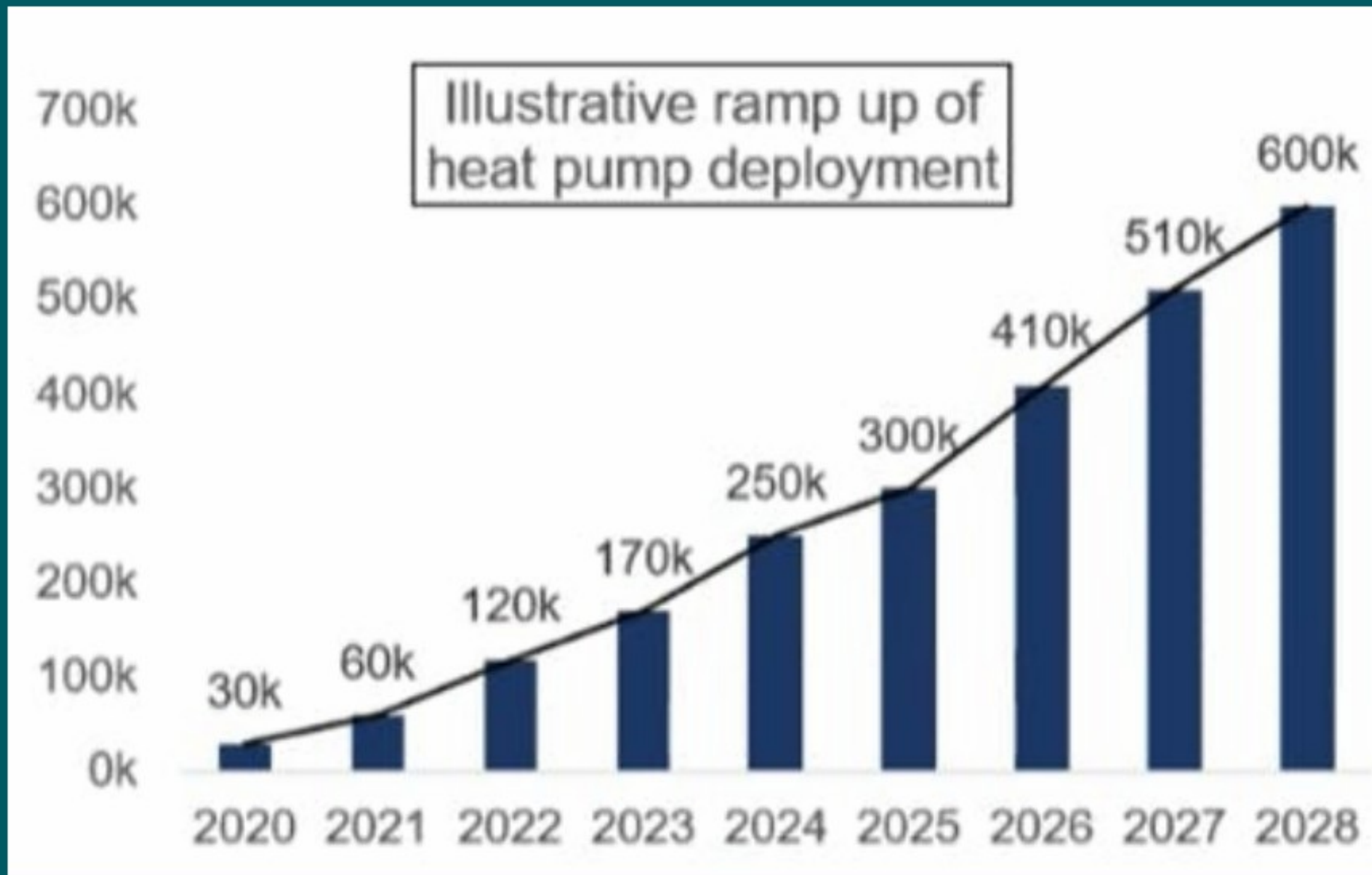


Electrified domestic heat

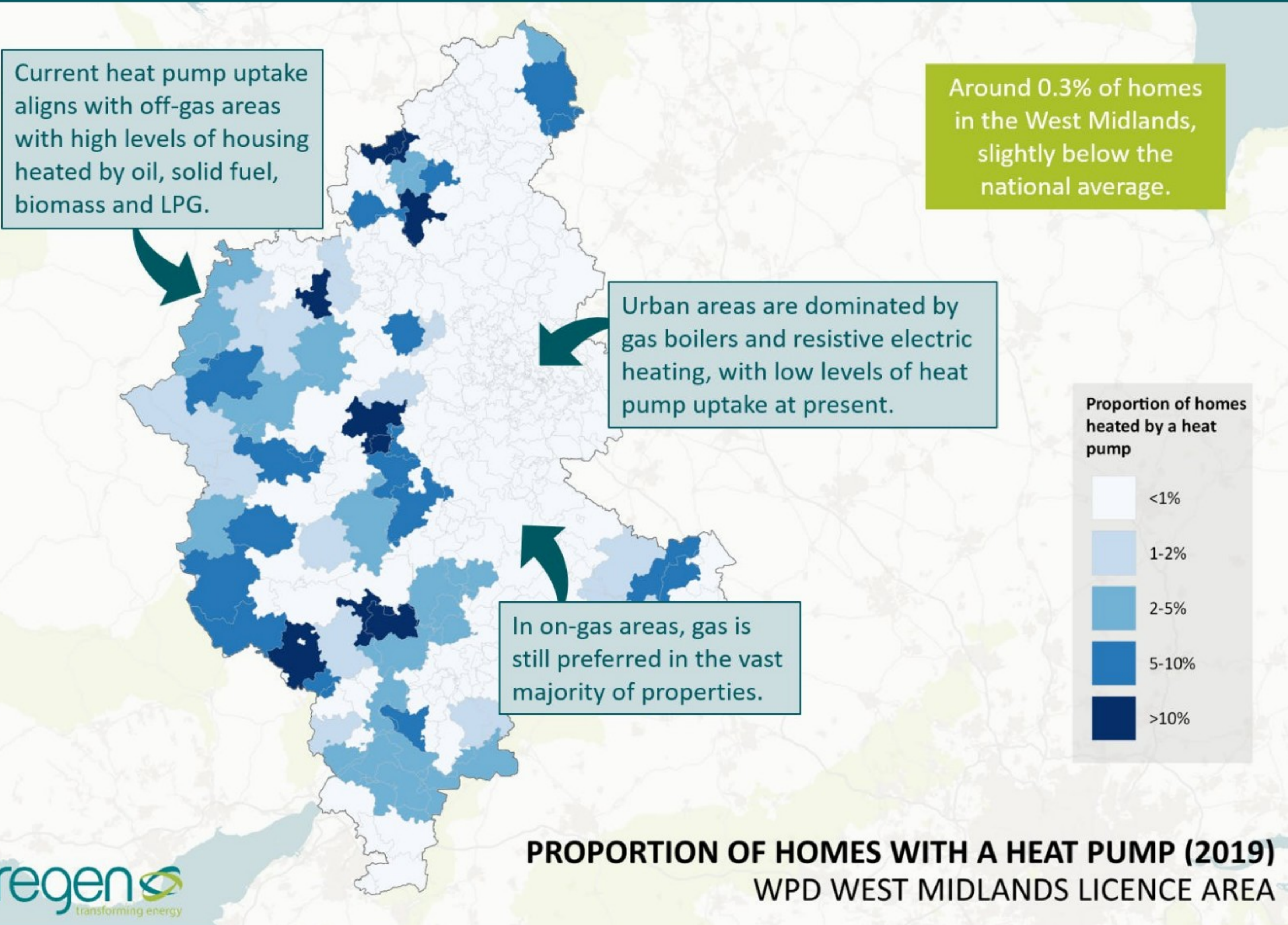
→ Jonty Haynes - Senior energy analyst, Regen



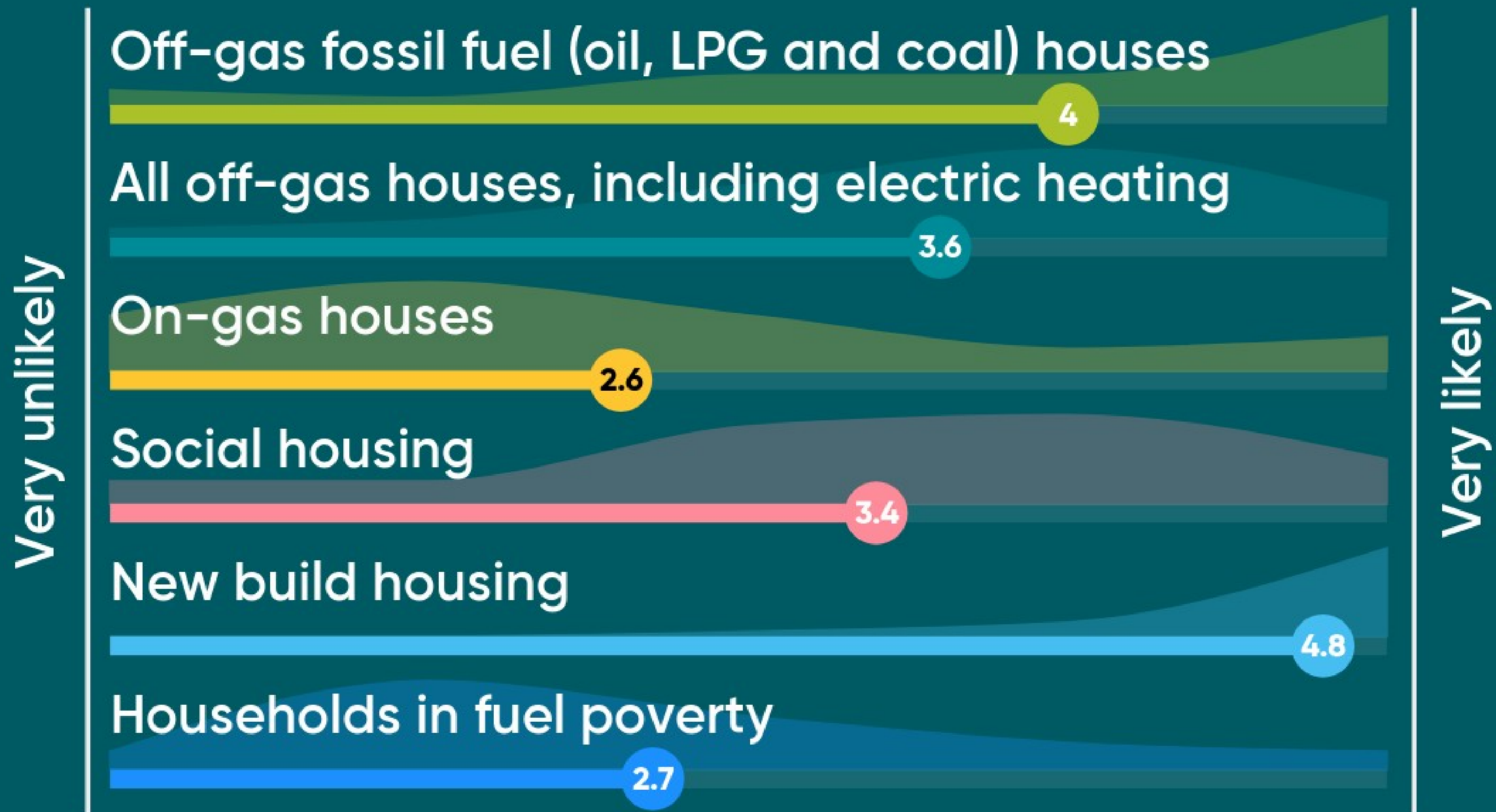
Domestic heat policy context

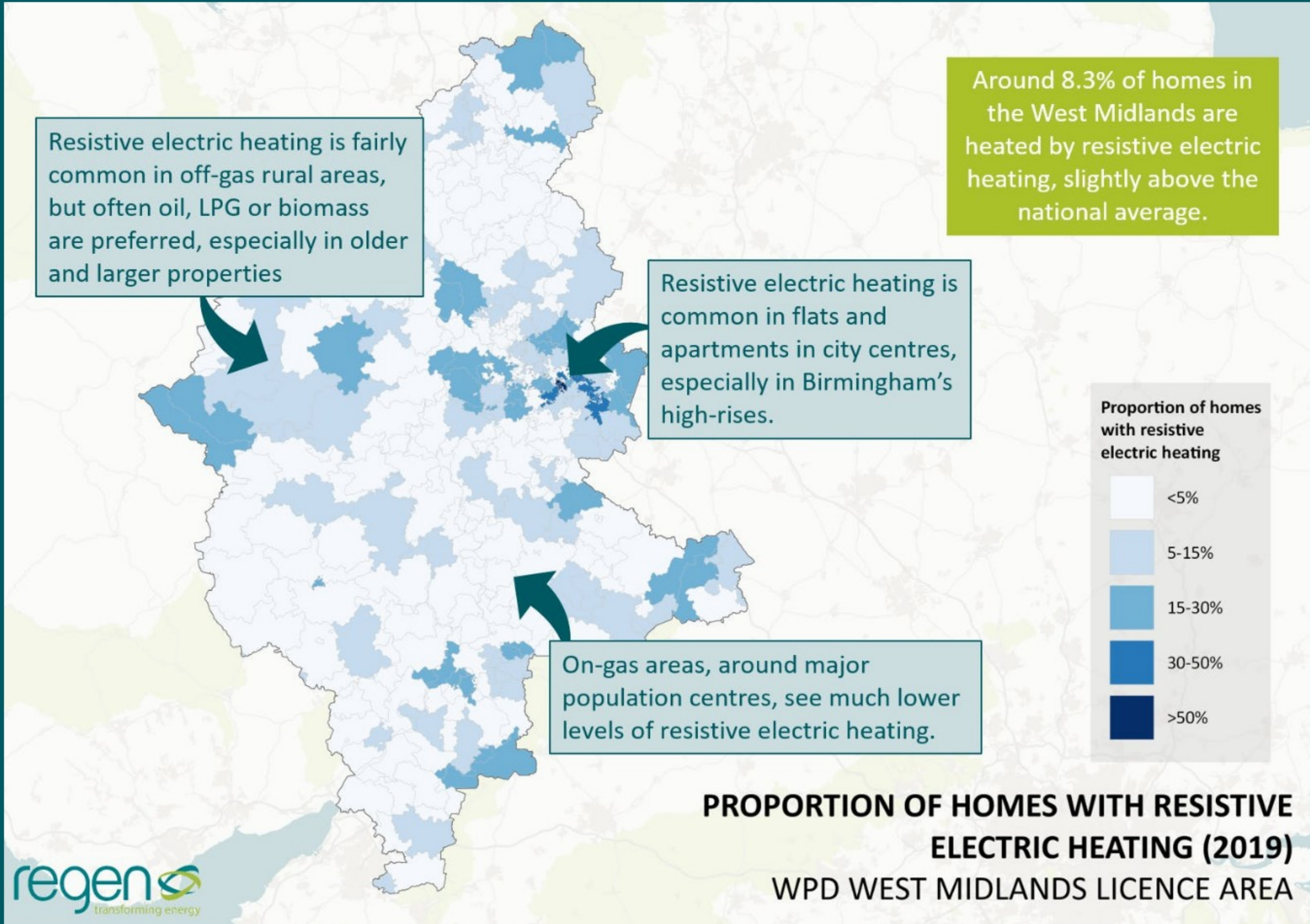


- Government ambition to install 600,000 heat pumps per year by 2028 (currently around 30,000 per year)
- Government ambition to phase out high-carbon fossil heating in off-gas properties in the 2020s
- Future Homes Standard, which will require new build homes to install low carbon heating, expected 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

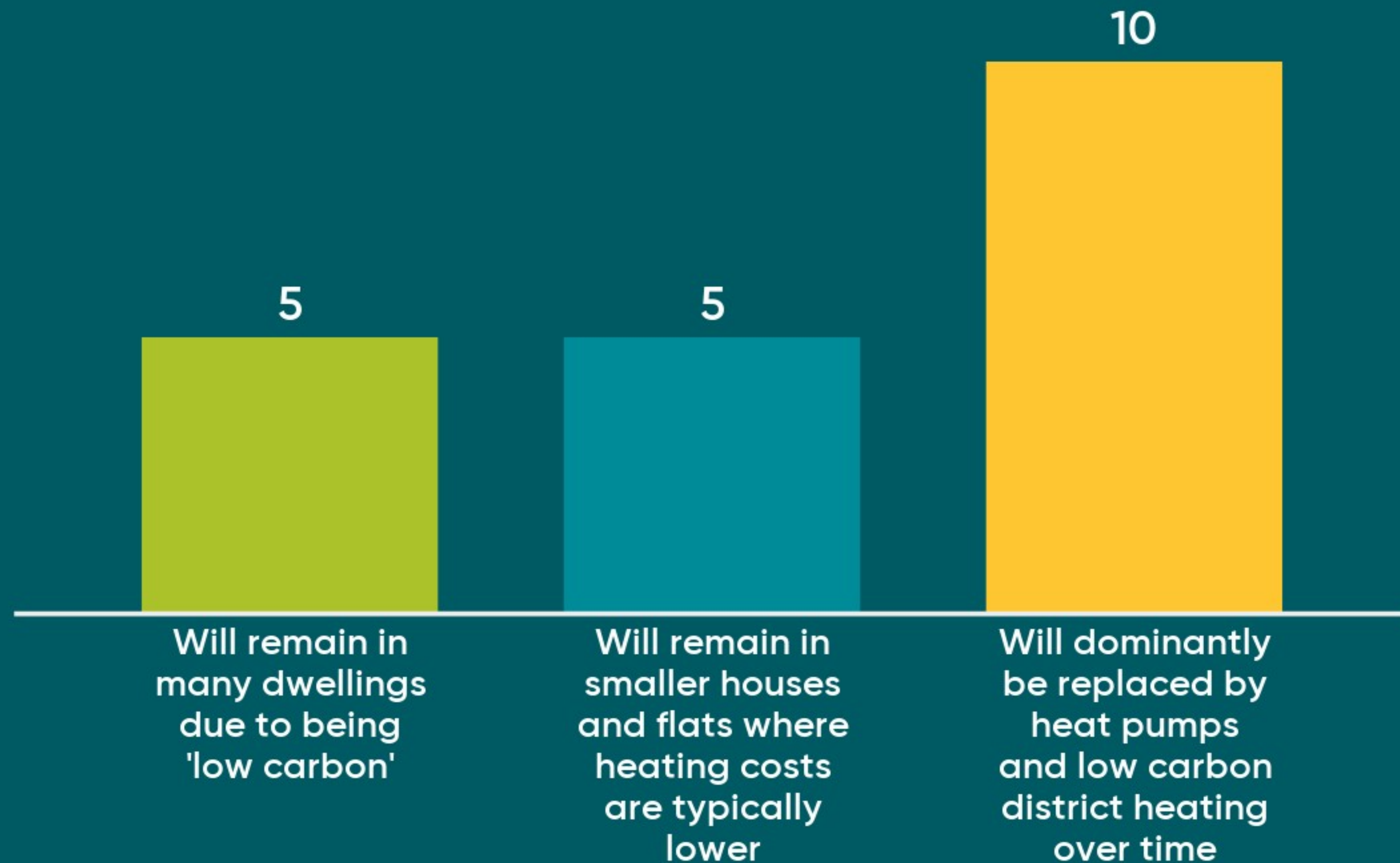


As the government looks to achieve its target of 600,000 heat pumps installed per year by 2028, which of these areas will be targeted?





What is the role of resistive electric heating in a net zero future?

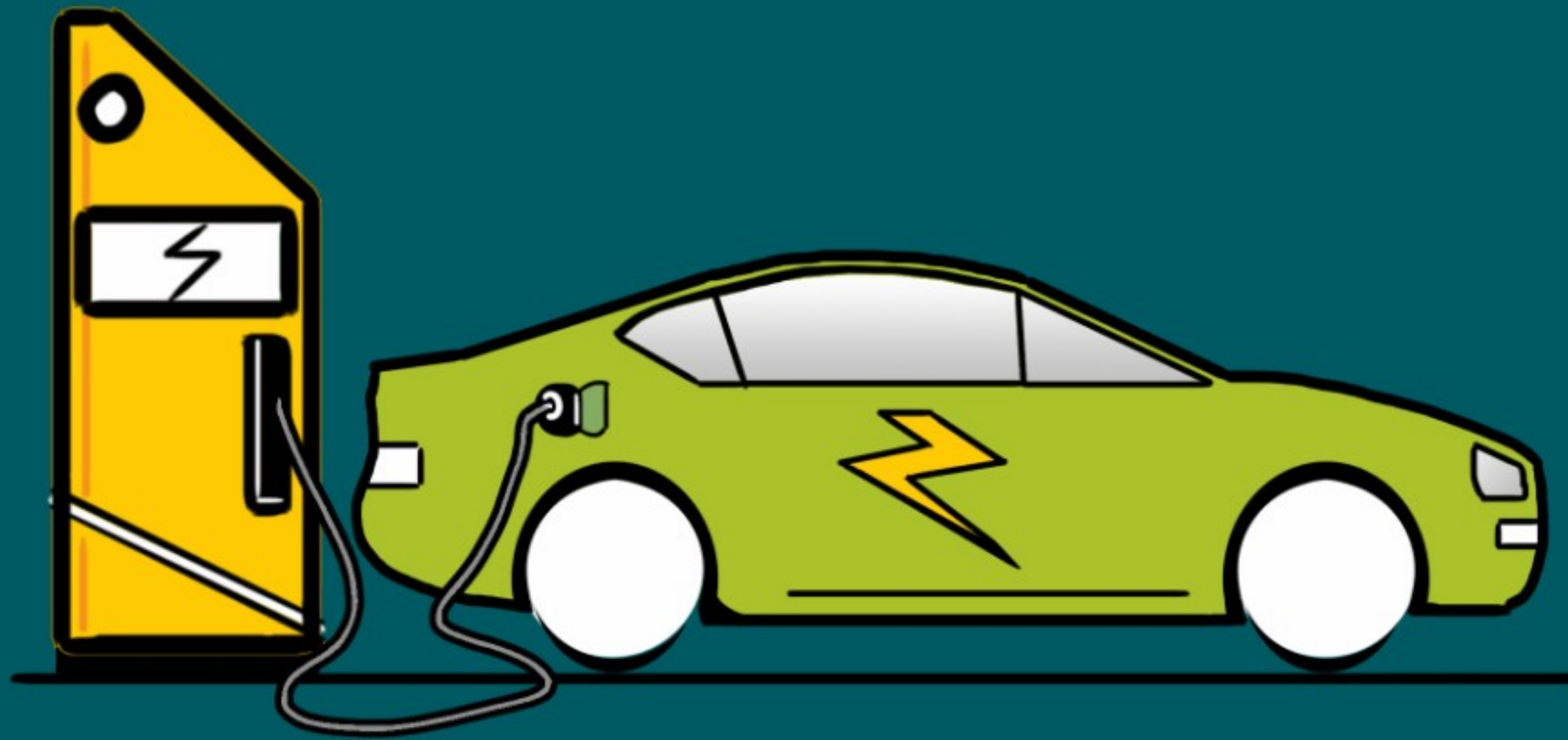


Electric vehicles

→ Jonty Haynes - Senior energy analyst, Regen



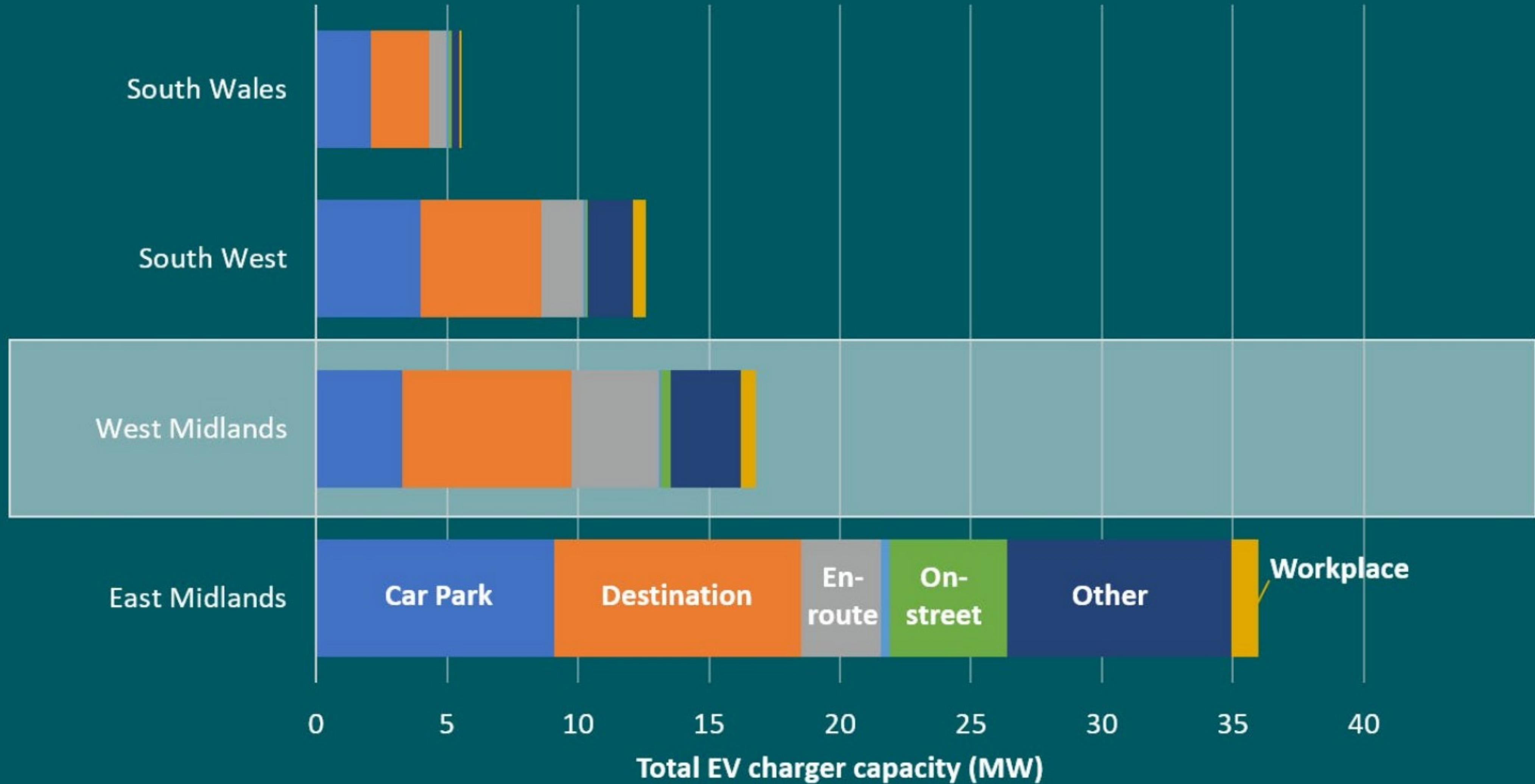
UK policy on EVs and EV chargers



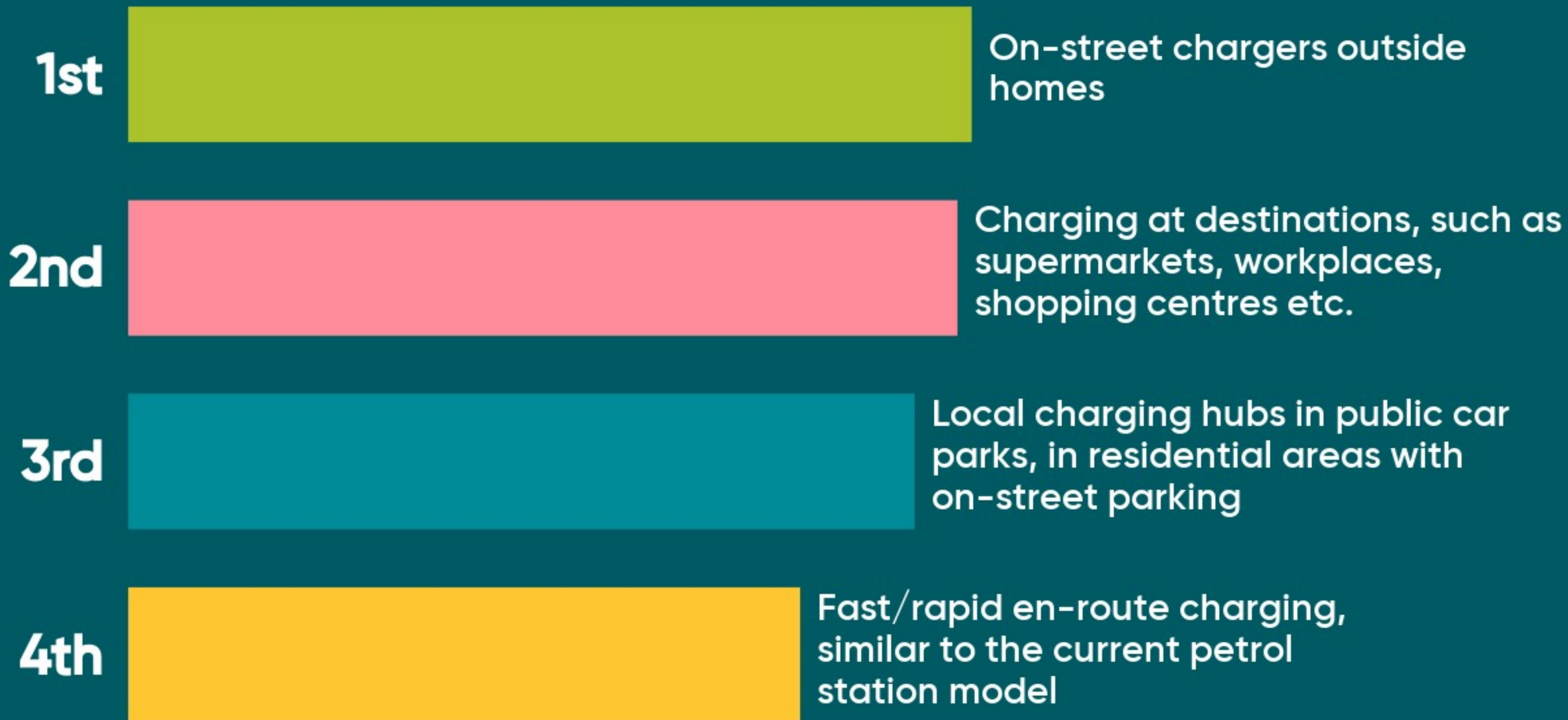
- End of the sale of new petrol/diesel cars and vans from 2030, with plug-in hybrid car and van sales allowed until 2035
- EV sales have increased dramatically since the start of the COVID-19 pandemic, with a more affordable second hand market also emerging
- Proposed changes to building regulations 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
- Clean air zones becoming active in many cities, such as Birmingham

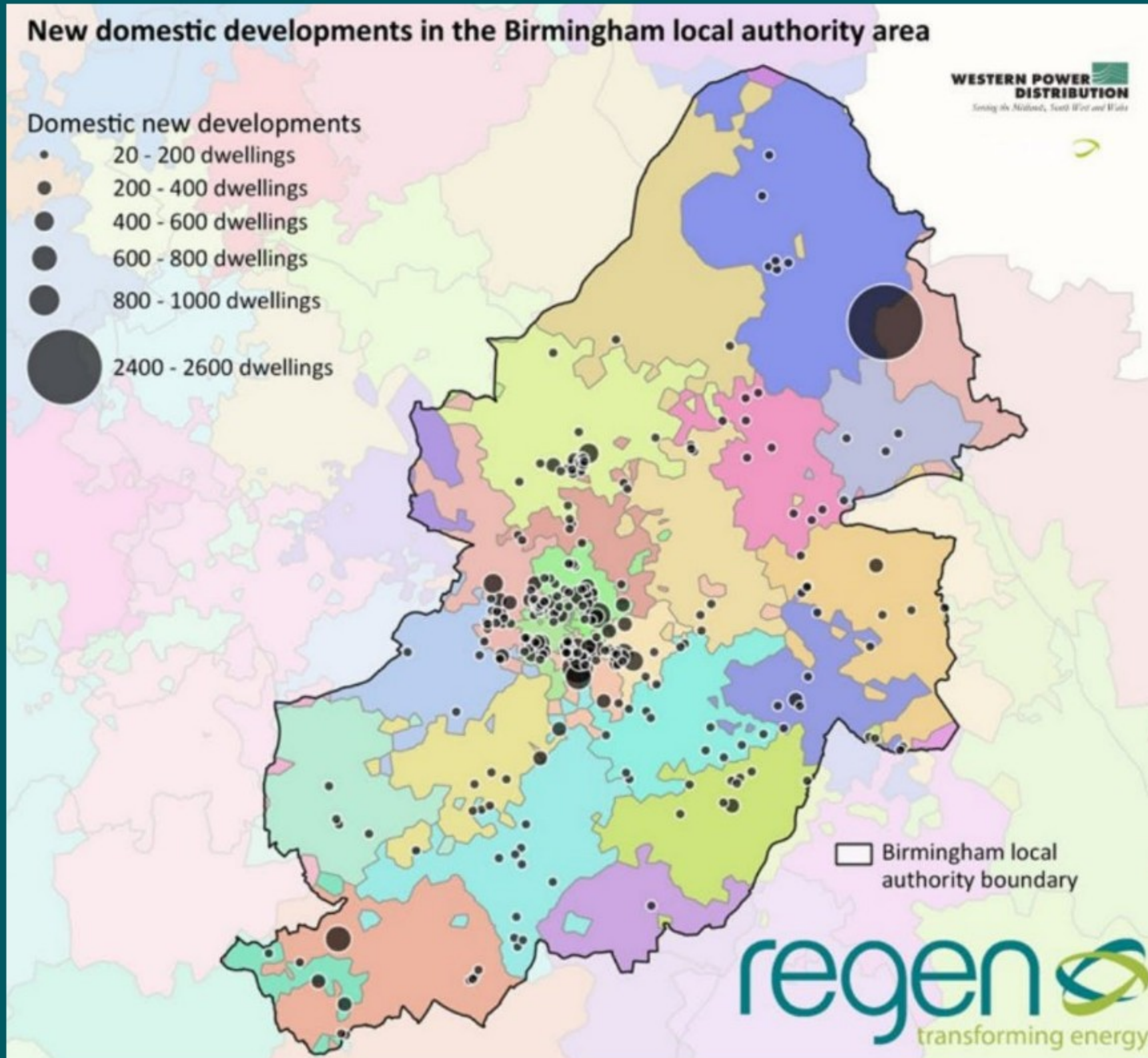
EV charging capacity by location type in WPD's licence areas

Source: National Chargepoint Registry



How popular will these potential solutions to EV charging for on-street parked vehicles be?





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?

1

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

4

Increasing EV charging infrastructure

2

Electrification of public transport, such as buses

0

Designation of zones for renewable energy

6

Refusal of planning permission for projects incompatible with net zero

14

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
- Ben Godfrey - DSO manager, 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?

