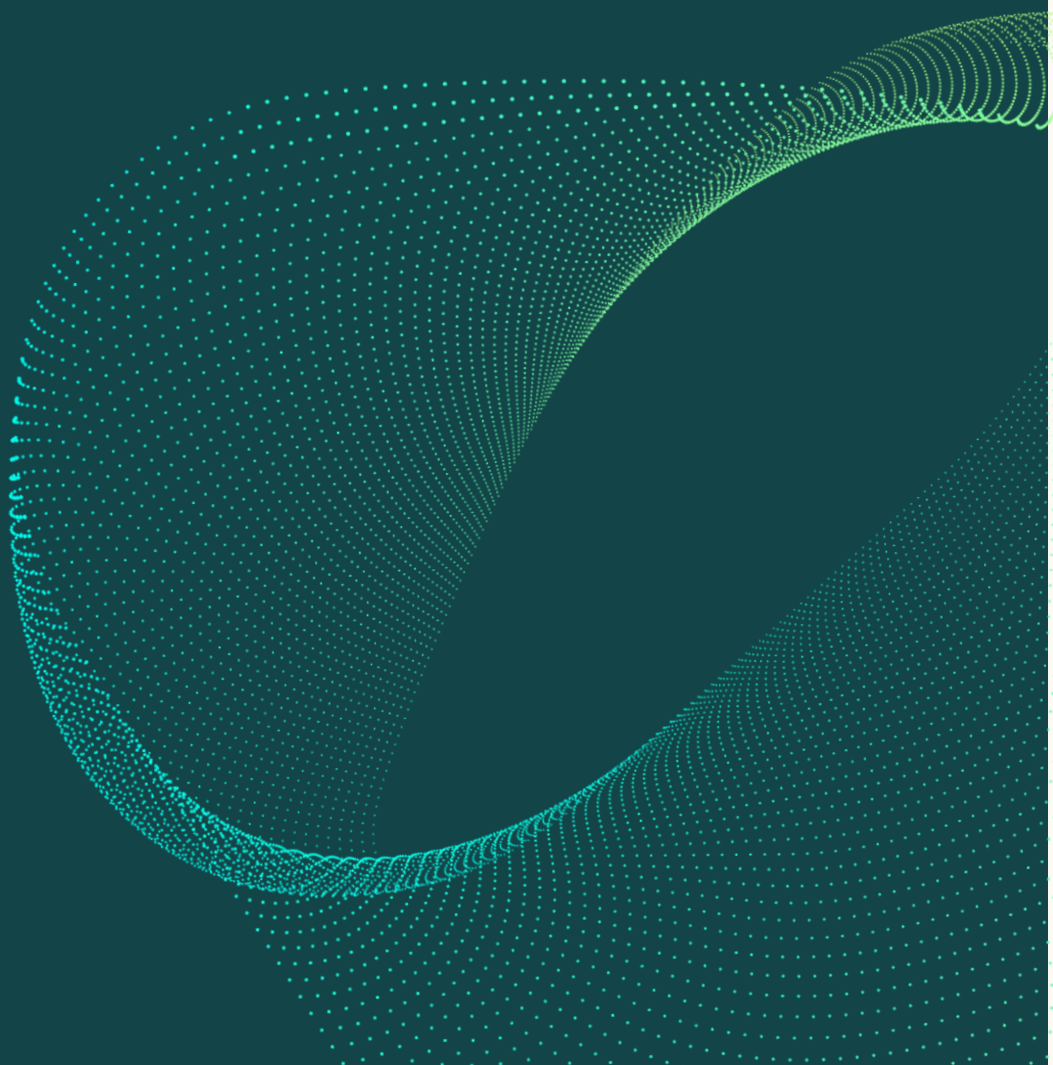
REGEN

Appendix 2: The potential

An overview of the mapping work done to identify potential opportunities for community energy in Manchester

AUGUST 2025



About Regen

Regen provides independent, evidence-led insight and advice in support of our mission to transform the UK's energy system for a net zero future. We focus on analysing the systemic challenges of decarbonising power, heat and transport. We know that a transformation of this scale will require engaging the whole of society in a just transition.

Contents

1

Introduction

Aims of research

This analysis aims to provide Greater Manchester Combined Authority (GMCA) (Figure 1) with a view of the renewable energy and community energy sectors to identify support opportunities for communities to own and deliver new projects in the region.

This provides a snapshot of the renewable sector's current state in Greater Manchester and looks ahead to opportunities for community energy to expand its portfolio in the coming years.

The key conclusions are as follows, and can be found in more detail throughout this document:

- Rooftop solar is a major opportunity for community energy in the region. Grid capacity is available for this scale of project, and there are many potential long-term sites, such as schools, hospitals and leisure centres, as well as viable potential community energy models.
- The majority of low-carbon technology in Greater Manchester is currently privately owned, including a majority of projects in the development pipeline. For projects in the pre-planning stage, the opportunity of shared ownership could be explored to rapidly increase the amount of generation in community ownership.
- While there seem to be limited sites for onshore wind from previous GMCA research, the sites that do exist are unlikely to have problems getting a grid connection. Community energy organisations would be well suited to develop this opportunity.

Glossary

Constraint – A constraint occurs when part of the electricity network (e.g. a substation, cable, or transformer) cannot carry additional power due to technical limits. If the network is constrained, it can often lead to a more expensive connection offer and/or a longer wait time to be connected.

Headroom – Headroom is the spare capacity available in the network at a given location to accommodate additional generation or demand without triggering a constraint.

Mega Volt-Amperes (MVA) – This unit of power combines active power (MW) with reactive power (MVAr). In this context, we broadly assume that if there is 10 MVA capacity, it can accommodate 9.5 MW of generation capacity (based on a 0.95 power factor).

Shared ownership – A model which involves a commercial developers and community organisations entering a financial partnership over the lifetime of a renewable energy project.

Methodology

The datasets used for this analysis include Greater Manchester Combined Authority (GMCA) Local Area Energy Planning (LAEP), Electricity North West (ENW) Distributed Future Energy Scenarios (DFES) and Renewable Energy Planning Database (REPD).

Where projects are referred to as 'in development', this means they are in the grid connection queue but have not yet started construction. Within this category, projects may be at various stages, including pre-planning, planning submitted, and planning accepted. Where projects are referred to as 'existing', this means they are constructed and generating electricity.

Projects that are in development have been found using the Renewable Energy Planning Database (REPD) and the Embedded Capacity Register (ECR). The REPD includes all projects that have come into contact with the planning process, and their progress. The ECR includes all projects that are connected, or accepted to connect, above 50 kW.

Existing projects data only includes sites over 50 kW due to data limitations. Some community-owned sites (Figure 2 shows an overview of the community organisations in GMCA) are under 50 kW and are therefore not captured in the mapping or averages outlined in the report. Community-owned sites include:

Community energy organisation	Number of sites under or equal to 50 kW	Number of sites over 50 kW
Greater Manchester Community Renewables	**6**	**2**
Oldham Community Power Ltd	**6**	**0**
Solar for Schools	**1**	**0**
Total	13	2

Areas identified as having **potential for wind or solar development** are taken from a study by Locogen, the methodology of which can be found in the accompanying data workbook.

Network headroom data is sourced from Electricity North West (ENW), the main network operator for the Greater Manchester area. Two small areas of land in Trafford and Manchester fall under Scottish Power Energy Networks (SPEN), which has not been included in the network mapping.

When analysing the network data from ENW, several assumptions were made in order to visually present the data in a clear and concise manner. The data was filtered to show: the inverter-based headroom; the Distribution Future Energy Scenario (DFES) Best View, and on the maps, only firm connections are shown. This is displayed for both the year 2025 (current) and the year 2030 (future). The future data is subject to change as further energy system planning is conducted (e.g. with Regional Energy Strategic Plans). As a key political entity in the region, the GMCA will have input into regional energy planning, which in turn will influence network planning.

The DFES Best View scenario represents the most likely path for the energy transition over the next 10 years and is used by networks to indicate the uptake or decrease in different types of technology and where they might be located, to help plan the future of the network. For further explanation, see ENW's latest publication about the DFES in the North West.

Regarding firm connections, datasets often have multiple layers indicating different levels of headroom availability (MVA) based on different factors, including whether the connections were firm or non-firm. Firm connections are those that are not subject to any curtailment or interruptions, whereas non-firm connections may have their generation supply turned down or off in response to the conditions of the wider network. For community energy projects, firm connections are preferable to reliably model income from generation over the lifetime of the project.

In our analysis, we have assumed that the substation is the limiting factor, which is most often the case, rather than infrastructure such as the network and cables.

Figure 1: Map showing Greater Manchester Combined Authority (GMCA) area

Community organisations involved in energy generation

Boundaries

GMCA local authorities

Urban areas

Active generation

Generation ambition

Source: Stakeholder engagement and research
Notes: Some organisations do not have a physical location within the area and as such their geographic location has been determined by an existing project. Some organisations have many project locations across the region. To see a list of project sites visit the Community Energy England website.

Figure 2: Community organisations involved in energy generation

2

The current state of the sector

An outline of the current state of the renewable energy sector in Greater Manchester.

The mix of low-carbon technologies

There is currently 793 MW of installed generation technology across the GMCA region. The largest proportion of this is fossil gas, with fossil fuels and waste making up 51% of existing generation. The rest of the generation is made up of 14% biomass or biogas, 19% renewables and 16% storage (Figure 3).

The data does not show small-scale rooftop solar data (less than 50 kW or 0.05 MW). Despite this, there is a total of 77 MW of solar above 50 kW per site spread across the area (Figure 4). Out of the existing 201 solar projects above 50 kW, only 15 are above 1 MW, with the average being 0.4 MW. This scale of project is typically due to the urban environment and prevalence of larger rooftop solar arrays on public sector, commercial and industrial buildings.

Solar is relatively evenly distributed across the Greater Manchester area, except for a noticeable lack of generation in Wigan. However, there is a healthy pipeline of solar projects currently being developed in the area. These are largely rooftop solar projects (Figure 5).

There are 10 wind projects in the north of the city that total 76 MW; however, onshore wind is underrepresented, likely due to the effective ban on onshore wind from 2015-2024 and GMCA being predominantly an urban area. A handful of small-scale hydro schemes exist, including the community-owned Stockport Hydro, which has been in operation since 2012.

The installed capacity of storage is 124 MW, with a pipeline of 2,474 MW (Figure 6). Many of the applications for a grid connection which make up the 2,474 MW will be speculative, and a fraction of these projects will go on to be built.

Ownership structures

The large majority of generation is owned by private developers, with public and community ownership accounting for only 21 out of the 436 sites over 50 kW, which is equivalent to 32 MW or 4% of total generation (Figure 7). A total of 11 MW of public or community-owned generation

is solar, or co-located solar and storage, 4 MW biomass or biogas and the remaining 17 MW is either publicly owned gas or oil.

Two sites over 50 kW are owned by a community organisation (Greater Manchester Community Renewables), and both are solar PV projects on schools.

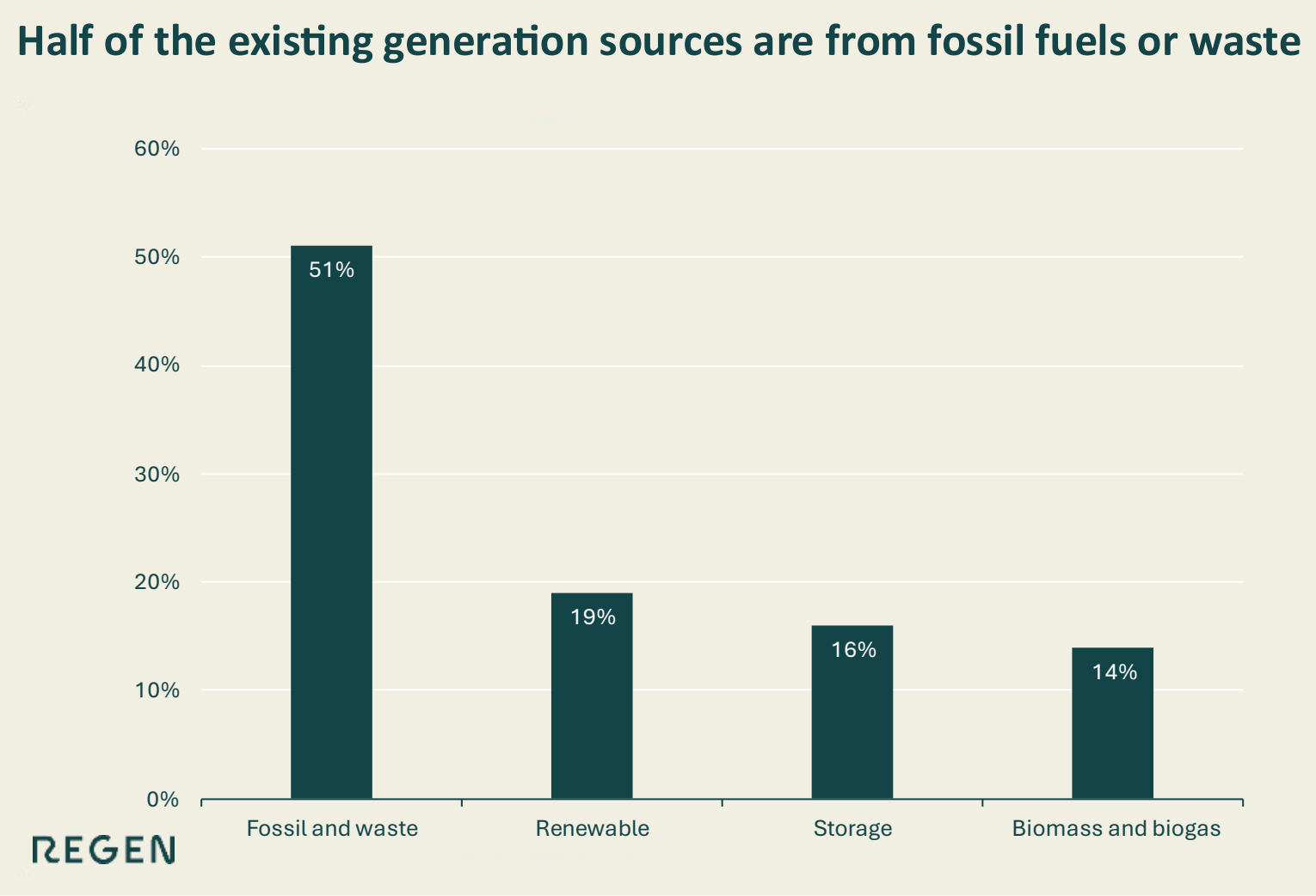
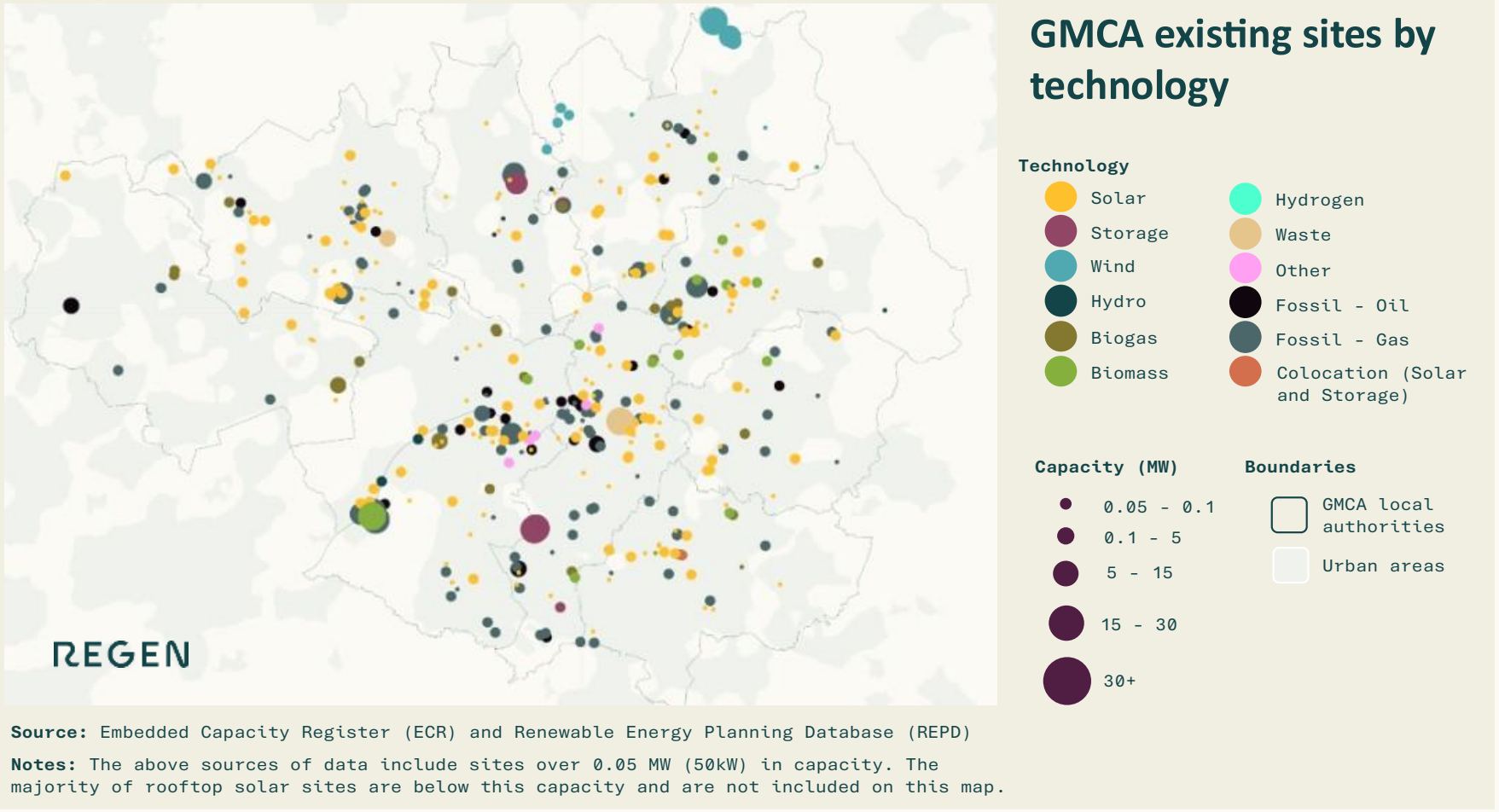


Figure 3: Existing generation in the GMCA region by type



Source: Embedded Capacity Register (ECR) and Renewable Energy Planning Database (REPD)

Notes: The above sources of data include sites over 0.05 MW (50kW) in capacity. The majority of rooftop solar sites are below this capacity and are not included on this map.

Figure 4: Existing generation sites in GMCA region by technology

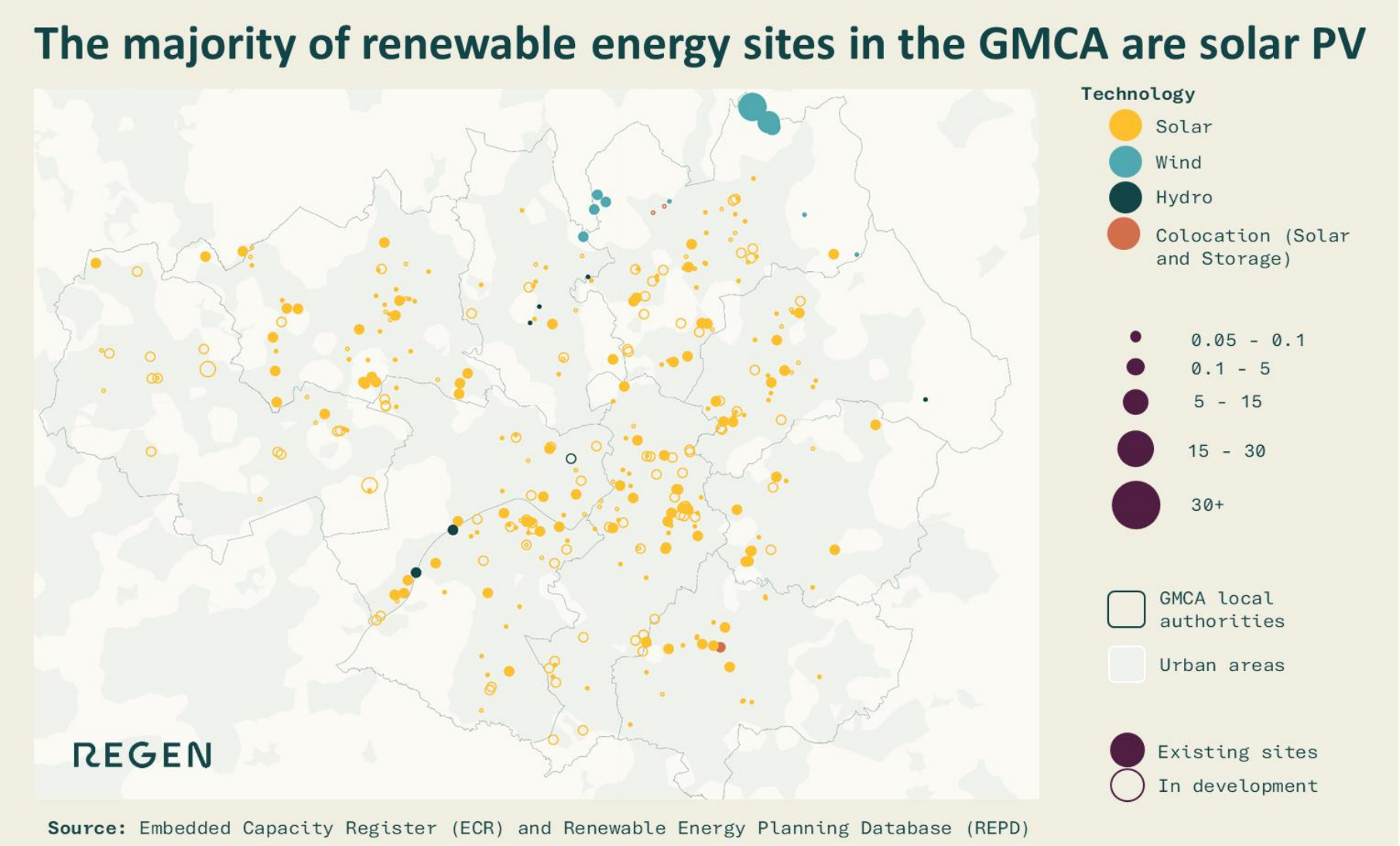


Figure 5: Distribution of existing and in-development renewable generation sites

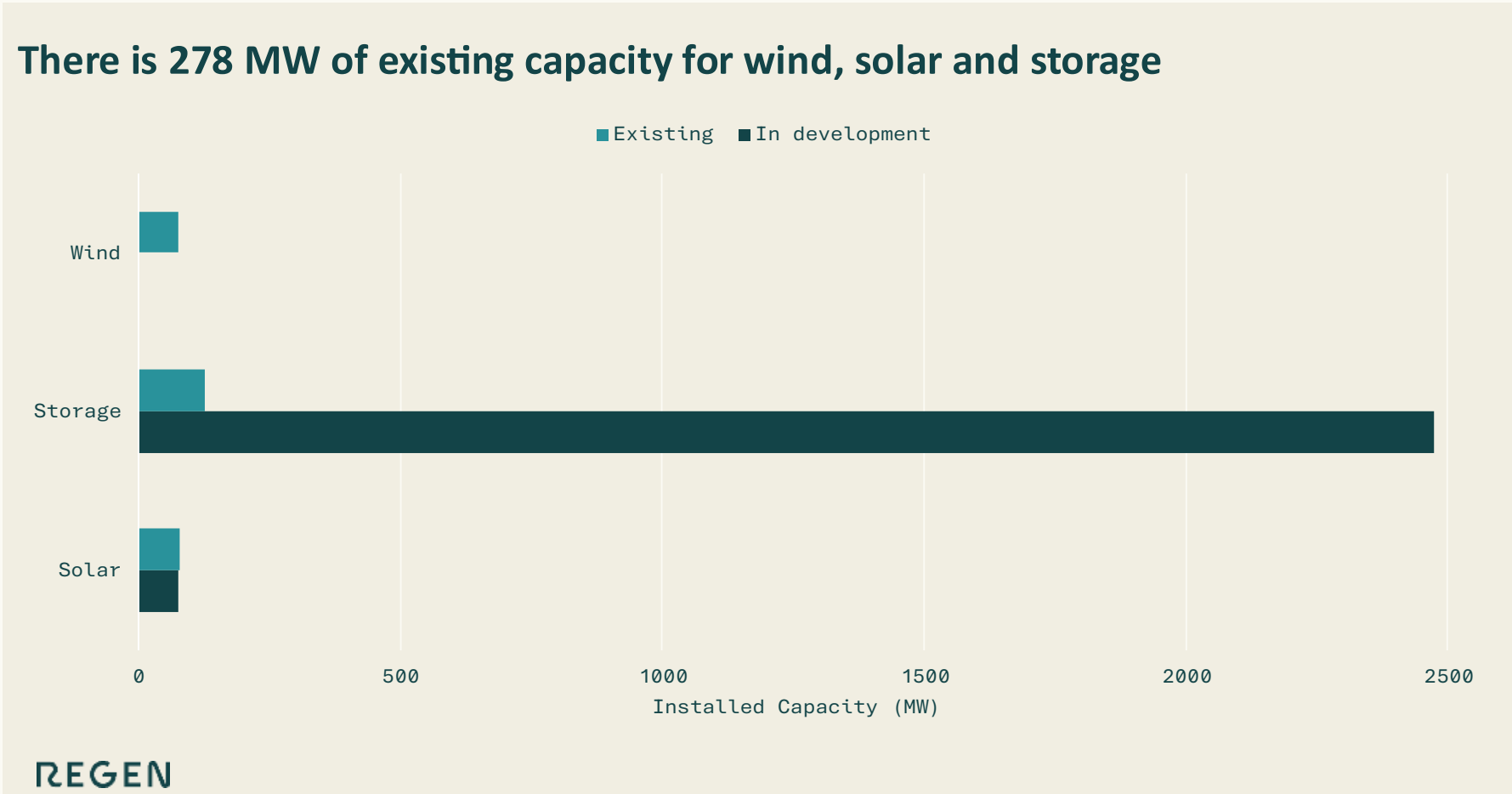
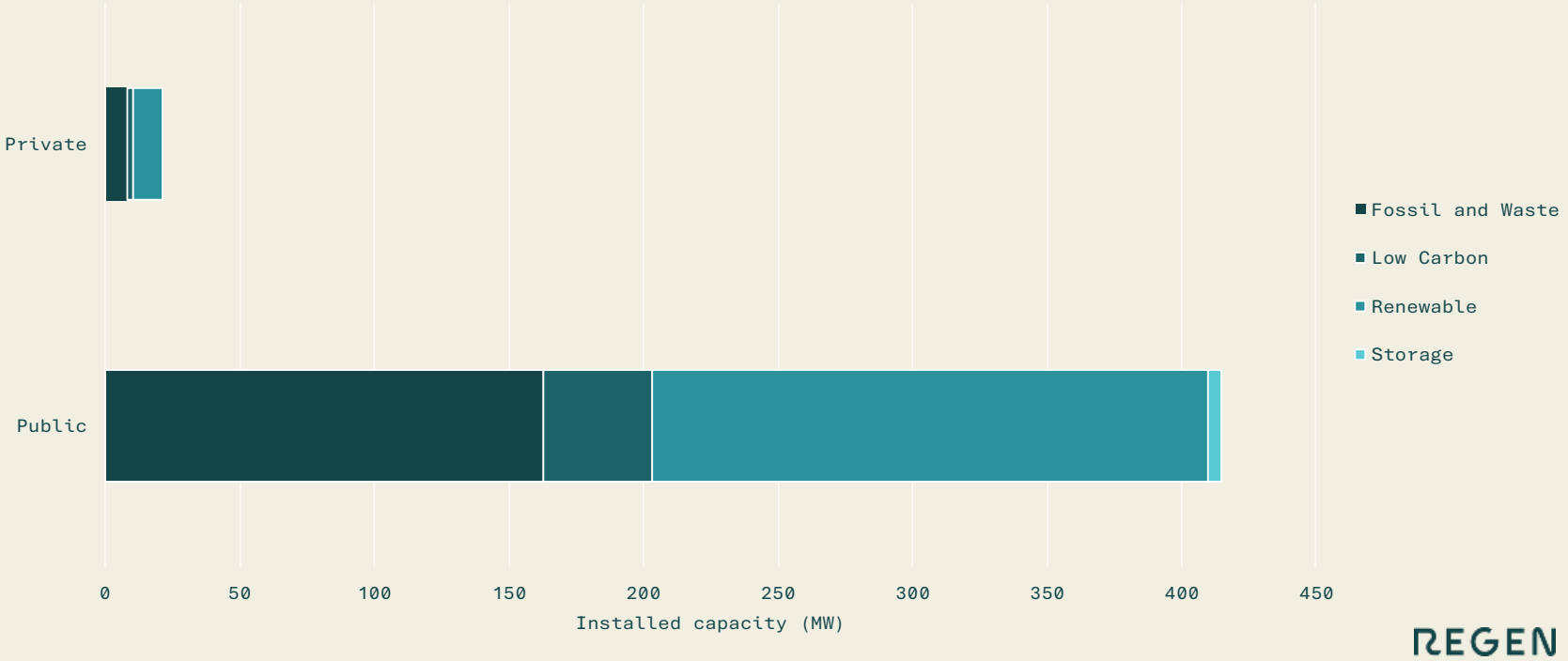


Figure 6: Graph showing the existing and in-development capacity of the three main low carbon technologies in the GMCA region

The majority of generation capacity in the GMCA are owned by private organisations

Public organisations own 21 of the 436 sites in the region. Of these 21 over half are renewable or low carbon technologies. Two sites over 50kW are owned by a community group (Greater Manchester Community Renewables), these are both solar PV projects on schools.



Source: Embedded Capacity Register (ECR) and Renewable Energy Planning Database (REPD).
Notes: The ECR only shows sites over 50kW in capacity and thus excludes rooftop solar, reducing the number of community owned sites.

Figure 7: Graph showing the MW of public and privately owned generation by technology

3 Future opportunities

The future of renewables in Greater Manchester, and where community energy can fit in

Shared ownership

The majority of projects being developed in the GMCA area are privately owned. There are opportunities here for community energy organisations to partner with willing private developers to develop *shared ownership* projects. This process could include community organisations or developers directly reaching out to one another, or the combined authority (or another intermediary) facilitating connection. Not all private developments will be suitable for shared ownership. Here, we have outlined a few important factors to consider:

- **Stage of development.** Developers are likely to be more resistant to shared ownership projects that are more developed (i.e. further along in the planning process, financial modelling, construction, etc) as this requires adapting established finance models, risk analysis and forward plans. Therefore, while more established projects should not be discounted as there is the possibility of the community buying in at a later stage in the project at a higher cost, it is likely that projects in pre-planning will be more willing to discuss the opportunity of shared ownership.
- **Type of developer.** Shared ownership is not currently mandated or incentivised in England (this may change with the Local Power Plan). Therefore, many developers are resistant to exploring this option due to perceived and real impacts on their projects. It will be more forward-looking, agile developers who see the value of shared ownership who will be most likely to be willing to enter discussions.
- **Type of technology.** Solar and wind shared ownership projects have been successfully developed several times in the past. However, there is only one example of a shared ownership battery site (see Feeder Road). This is likely due to the more complex business model of battery storage that relies on many different markets and has a more fluctuating income, compared to wind and solar. This level of risk could be off-putting to community organisations. Wind and solar thus make for more demonstrated and well-understood models.

Size of opportunity

The table below outlines the projects over 5 MW that are currently either in planning or the grid queue. It is worth noting that not all of these projects are guaranteed to progress, depending on the assessment of their planning applications or challenges in securing future funding, for

example. However, as new renewable and storage projects are initiated, there is an opportunity to embed shared ownership models within Manchester.

Technology	Number of projects in development	Total capacity of projects (MW)
Solar	**3**	**21**
Storage	**35**	**2,474**
Total	38	2,495

The three larger ground-mounted solar projects that are privately owned are outlined below:

Developer name	Project name	Size of project (MW)
Whitehead Restoration Limited	Whitehead Landfill Site, Lower Green Lane - Solar Farm	10
Sas Energy - Wigan Council	Makerfield Way Depot	7
Novus Solar Developments Ltd	Chamber House Farm	4

Solar

Rooftop solar

In the urban environment, rooftop solar is a key opportunity for community organisations. The main challenges with this include:

- **Finding suitable sites.** For the typical community energy solar business model to work without a clear long-term national price mechanism (such as a feed-in tariff or contract for difference), the site must consume a large percentage of the energy generated to ensure a viable return for the electricity generated. The site should also preferably be south-facing and on a 30-40 degree slope.
- **Approaching and negotiating with the site owner.** Approaching building owners, explaining the concept and case for community energy, and creating individual contracts and agreements can be time-consuming as well as expensive.
- **Finding long-term partners.** The business model for community energy is difficult to justify and currently requires a building with high energy use that can use most of the energy generated by the solar panels.

Buildings for public good, such as schools, hospitals, leisure centres, etc, can be excellent sites for community energy. These buildings are likely to be owned by the same organisation (often a local authority) for years to come and are often high energy users – suited for the current community energy business model. In Manchester, there is an even distribution of these types of sites across the city (Figures 8-10). With 2,863 buildings in the GMCA region that are used for public good, this is a **huge opportunity for community-owned rooftop solar**.

The ownership structure of these buildings in Manchester is varied (Figure 11). For each structure, there is likely different legal and governance processes that need to take place. Since the large majority (1,329) are a limited or public limited company, it is sensible to focus on creating a replicable offer to these types of organisations to support the growth of rooftop solar projects.

Over 5 MW ground-mounted solar

Sites over 5 MW will be ground-mounted solar that require 20-30 acres of land. The exact acreage will depend on the type of panels and how efficient they are. Within the GMCA area, several sites have been identified by previous research (LAEP and Locogen) that could be suitable for larger ground-mount solar projects (Figure 12). Prioritising community-owned generation in accessing this information and sites could support the sector in exploring new generation.

However, these projects are unlikely to be able to be developed before 2030 due to the Clean Power Plan, which has assigned pots of renewables for each region at the transmission network level. For the region Manchester sits within, T4, the solar pot is nearly full, meaning it will be difficult to get a connection agreement before 2030. More detail can be found on the CP30 pots on Regen's dashboard.

Under 5 MW ground-mounted solar

Projects under 5 MW are not included in the transmission impact assessment (TIA) or CP30 pots and therefore do not enter the transmission queue. However, they will still need capacity at the distribution level to be able to connect. If there are constraint issues, they will need to join the distribution queue and be subject to potentially prohibitively expensive upgrade costs. It's important to note there are areas which are exceptions to this rule, where any project above 1 MW will be subject to the TIA and therefore the transmission queue (and CP30 pots). In the GMCA region, the Grid Supply Points where the cut-off is 1 MW instead of 5 MW are Kearsley, South Manchester and Stalybridge (more detail found here).

At the primary substation and bulk supply point levels (where under 5 MW, the majority of generation projects will connect), there is enough capacity for new small-scale generation projects to connect (Figures 13-16). Almost 90% of primary substations are forecast to have

over 5 MVA of generation headroom in 2030, and almost 95% of bulk supply points have over 5 MVA of generation headroom, so primary level or BSP constraints should not delay the connection of sub-5 MW renewable projects.

Where the grid capacity is low going into 2030, for example, at the bulk supply point level in parts of Wigan, Manchester, Oldham and Rochdale, local authorities should work alongside the network operator (ENW) to identify community energy priority areas and viable paths for network upgrade.

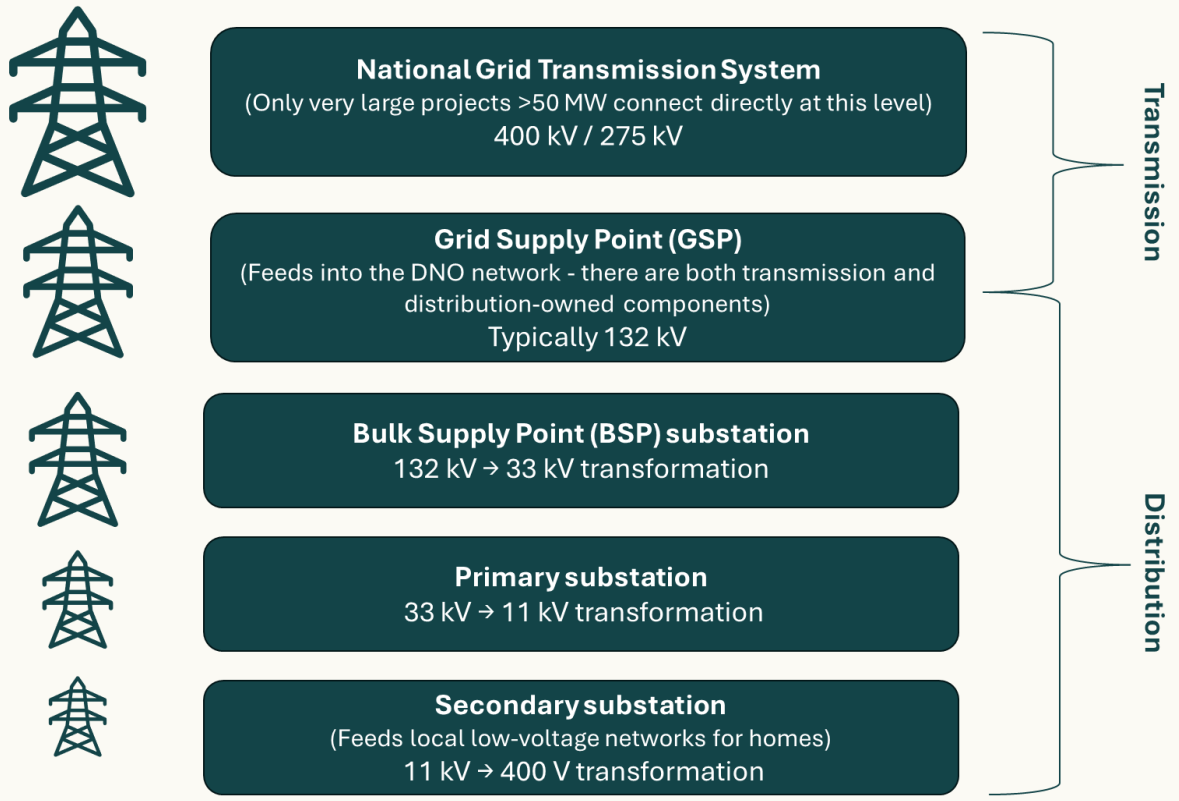


Figure 8: Graphic showing different levels of substation on the electricity network

Onshore wind

Community projects for onshore wind have tended to range between one and three turbines.

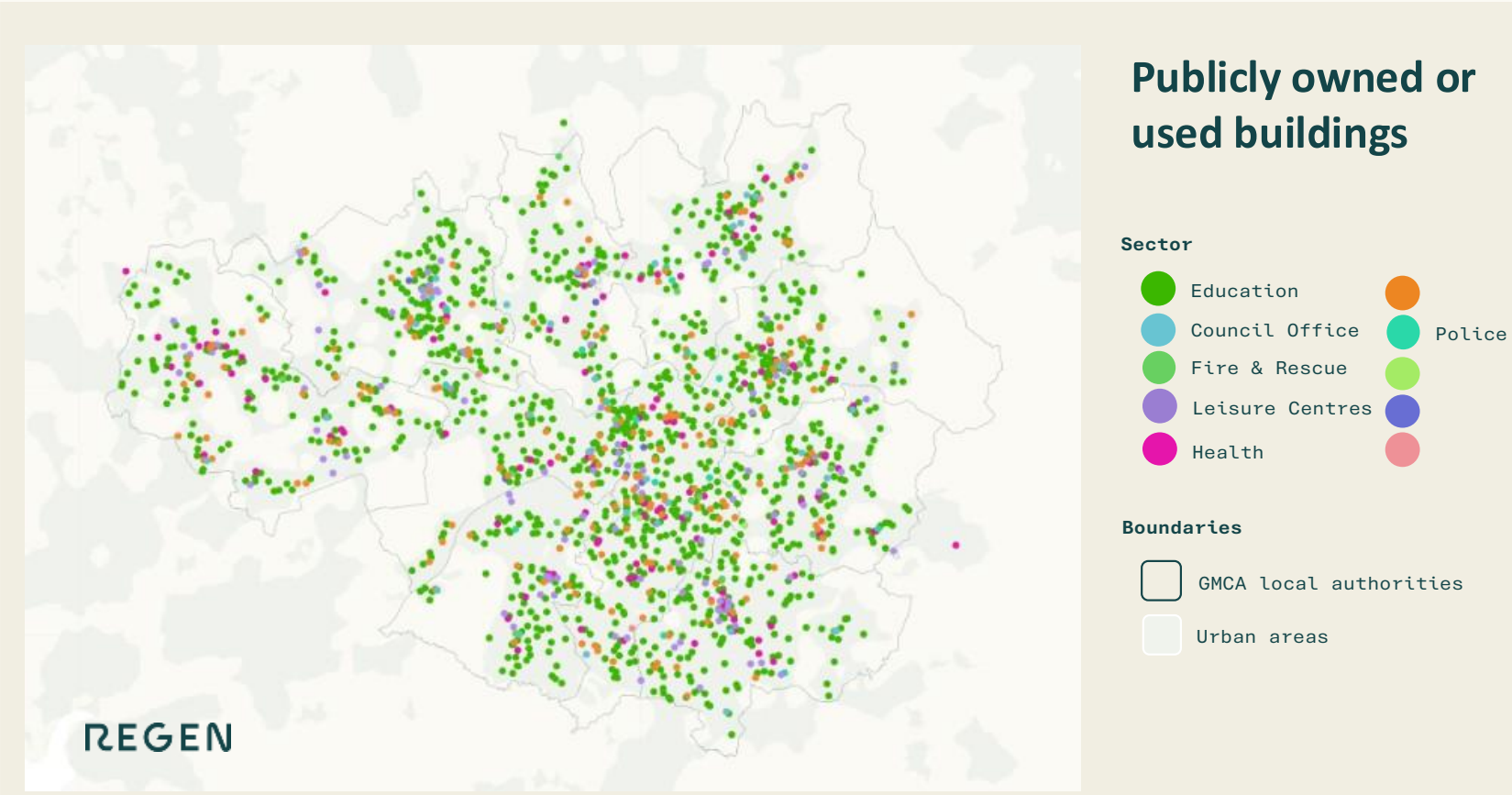
Over 5 MW

Across the country, there is a deficit in the amount of onshore wind currently in the queue to meet CP30 targets. As a result, new wind developments are highly likely to receive a grid connection offer. At this stage, project developers must submit evidence of land rights, planning progress and other key project information in order to secure a connection. More information on connections reform can be found in the policy briefing.

However, while getting a connection offer may be possible, the majority of Grid Supply Points (GSPs) across Greater Manchester are currently constrained (Figure 17). This would lead to the connection offer including the cost of upgrading the network, which may impact project viability. Where the local or combined authority has identified key areas for development of community projects, they should work with distribution and transmission network operators to understand options for grid upgrades and identify viable solutions to bring these forward.

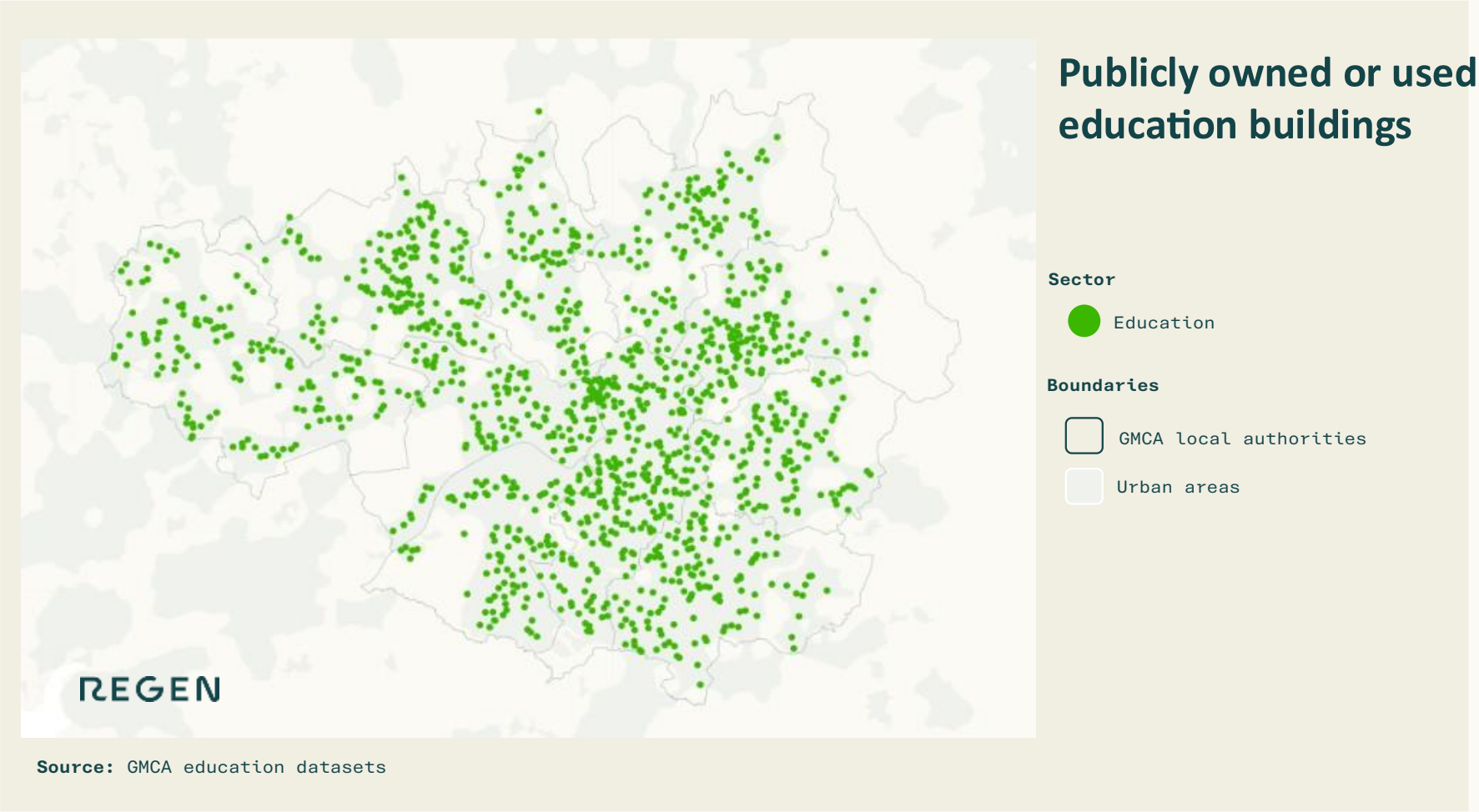
Under 5 MW

For onshore wind projects under 5 MW the same considerations apply as for solar.



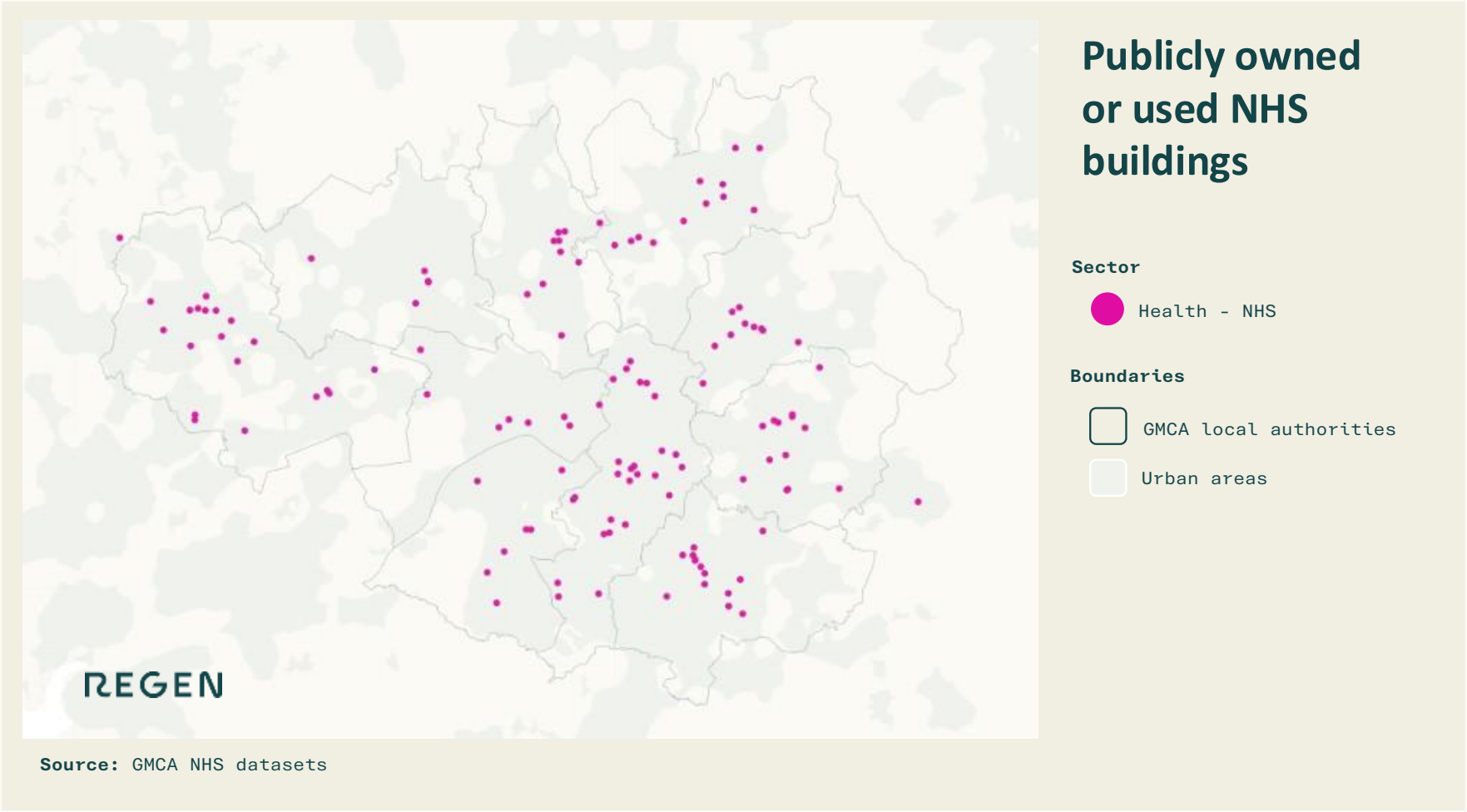
Source: GMCA Energy System Catapult InSite data for buildings, and GMCA NHS and education datasets

Figure 9: Map showing the distribution of publicly owned or used buildings



Source: GMCA education datasets

Figure 10: Map showing the distribution of education buildings

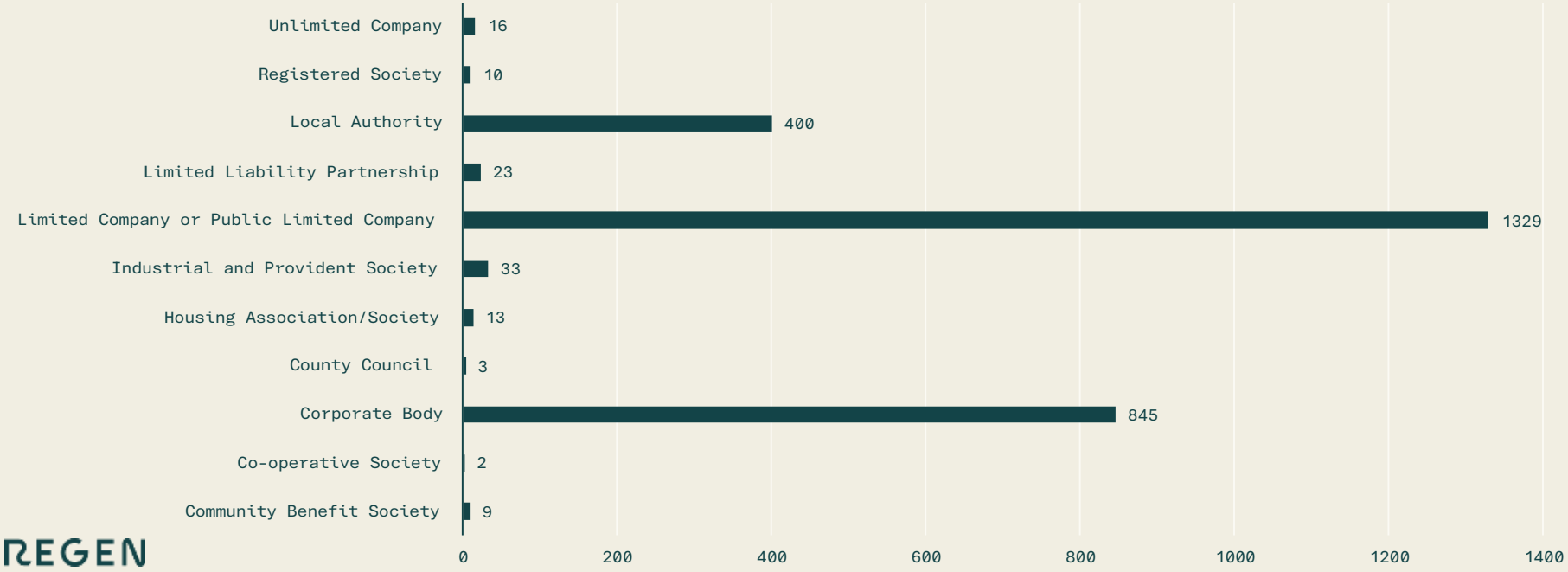


Source: GMCA NHS datasets

Figure 11: Map showing the distribution of NHS buildings

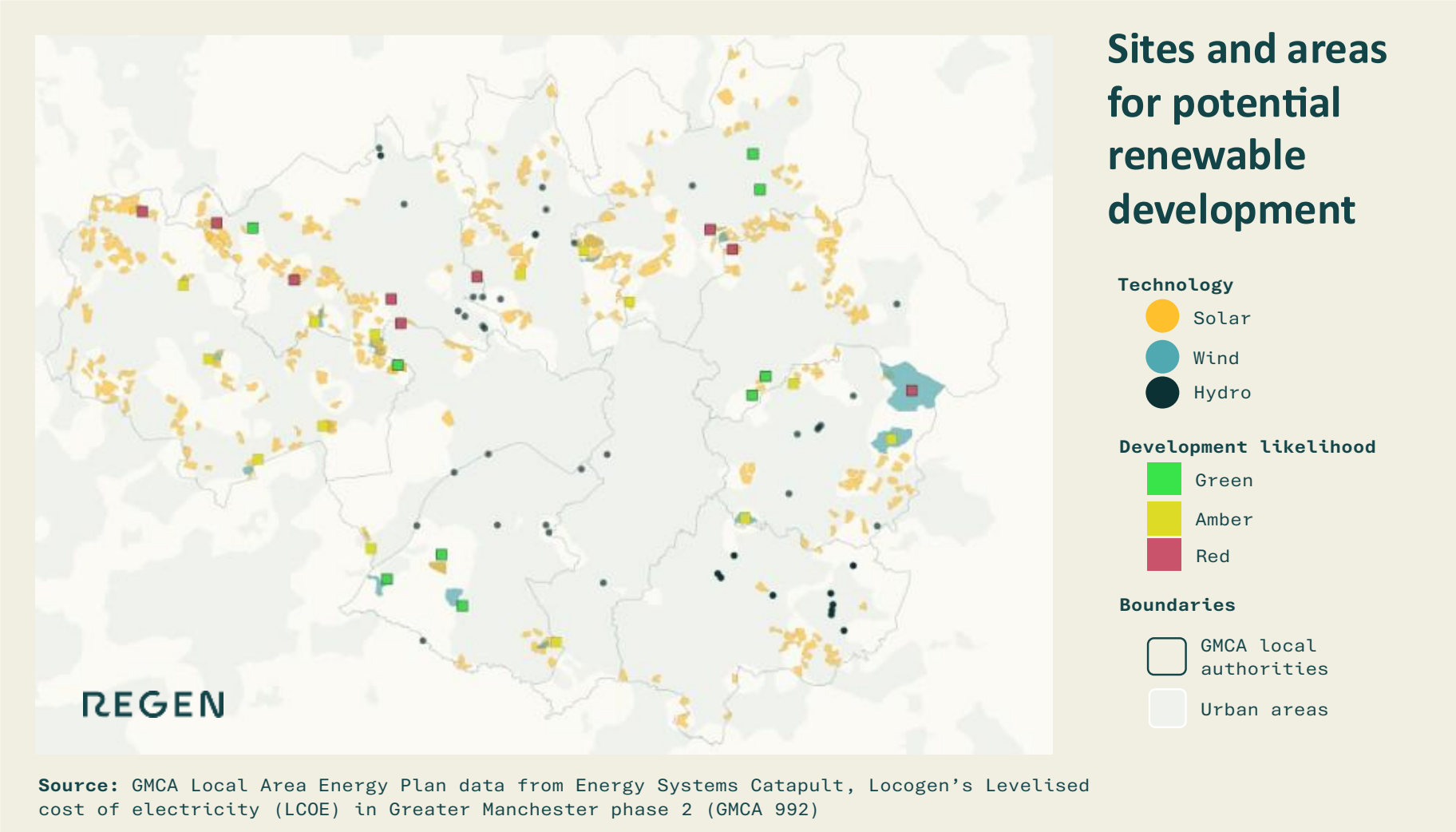
Ownership of public use buildings in Greater Manchester Combined Authority

Half of all public buildings in the GMCA are owned by Limited or Public Limited Companies, 31% by Corporate Bodies and Local Authorities owning 15%. Community Benefit and Co -operative Societies own only 0.4% of public buildings.



Source: GMCA Energy System Catapult InSite data for buildings

Figure 12: Graph showing the ownership structures of the public use buildings in GMCA

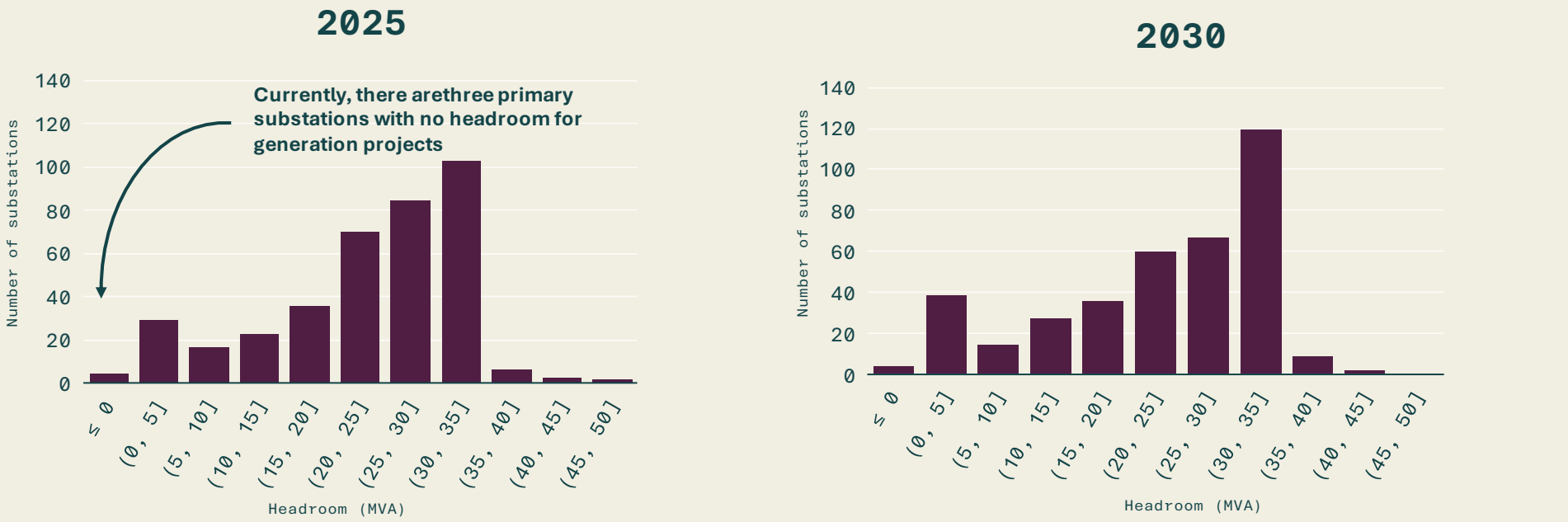


Source: GMCA Local Area Energy Plan data from Energy Systems Catapult, Locogen's Levelised cost of electricity (LCOE) in Greater Manchester phase 2 (GMCA 992)

Figure 13: Sites and areas for potential renewable development with RAG rating for development likelihood

Network headroom at the primary substation level

Primary substations within the GMCA have a range of headroom availability, with MVA of 20-30 the most common in 2025 and 30 -40 the most common in 2030.



Source: ENW NDP PRY BSP generation

REGEN

Figure 14: Network headroom for primary substations in GMCA region

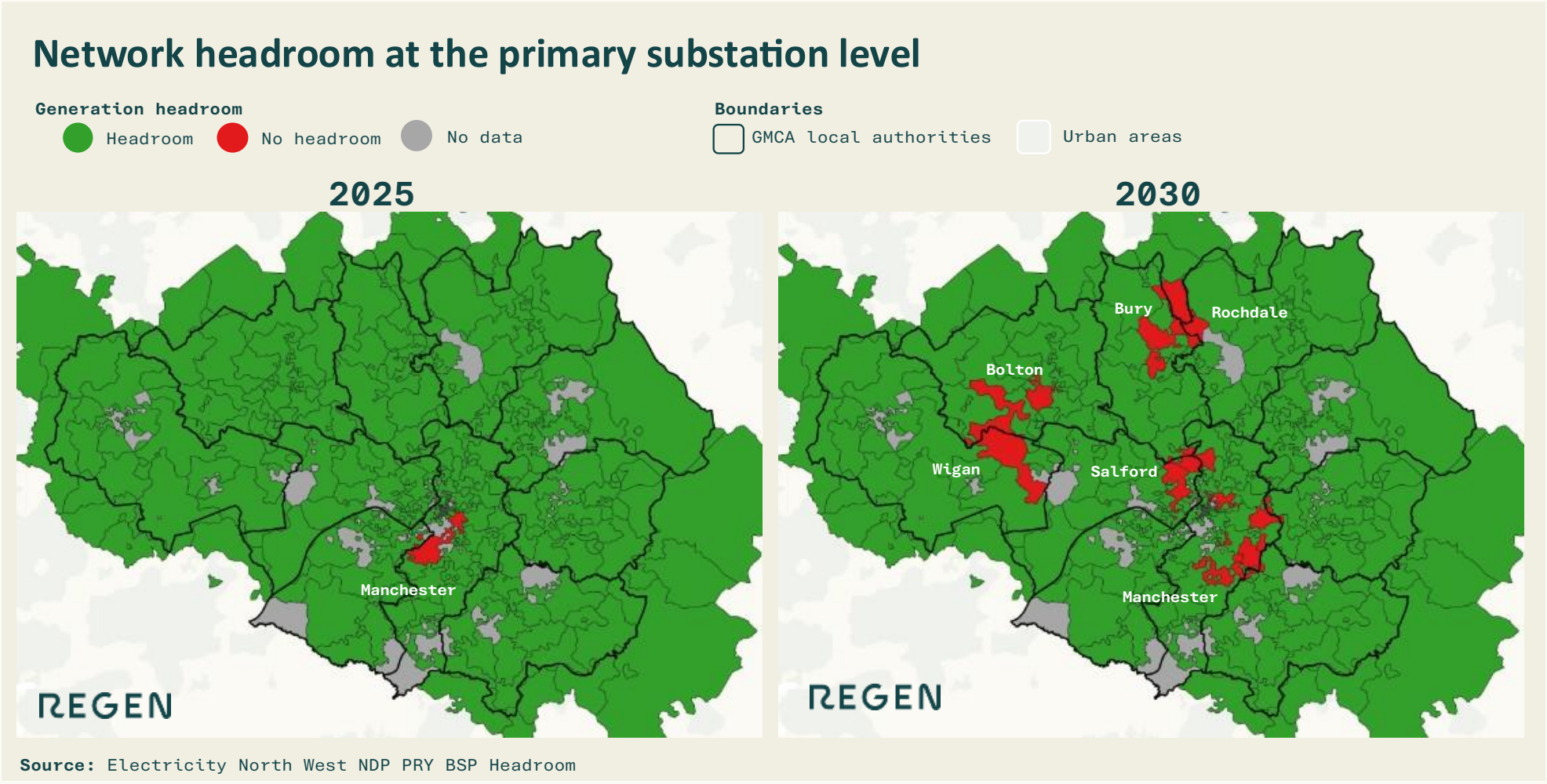
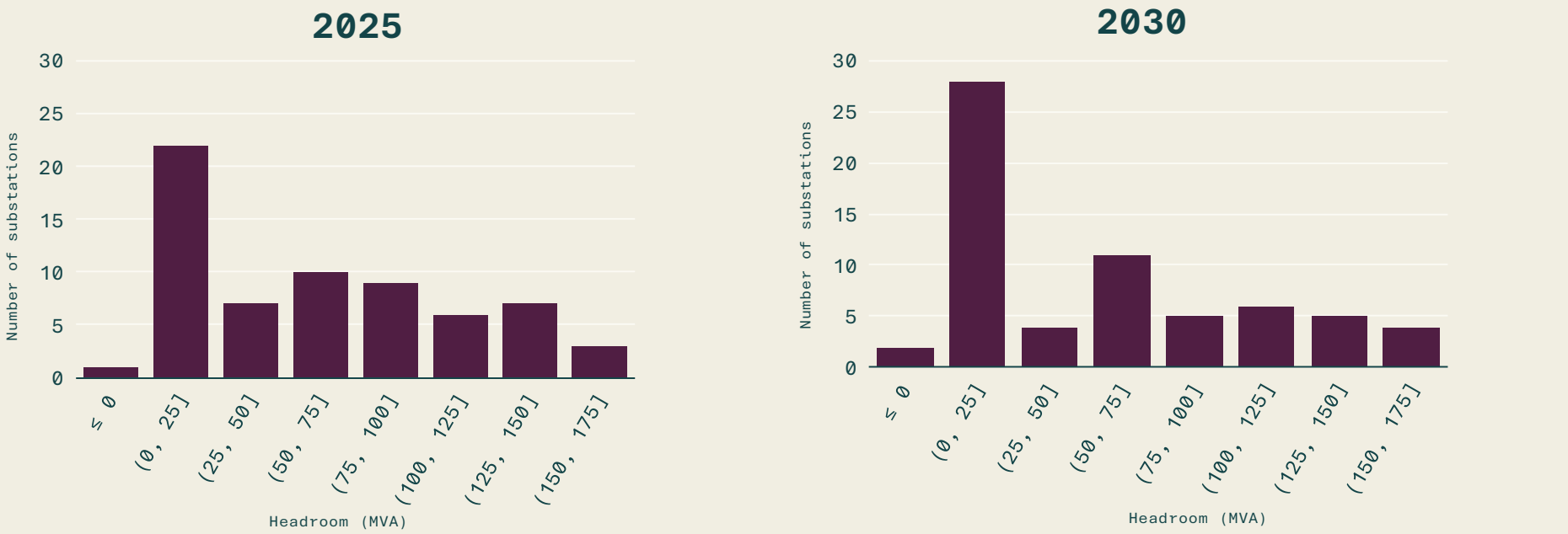


Figure 15: Map showing headroom availability for the primary substation level in GMCA region

Network headroom at the bulk supply point level

Bulk supply points within the GMCA have a range of headroomavailability, with MVA of 1-25 the most common in 2025 and 2030



Source: ENW NDP PRY BSP generation

Figure 16: Network headroom for bulk supply point level in GMCA region

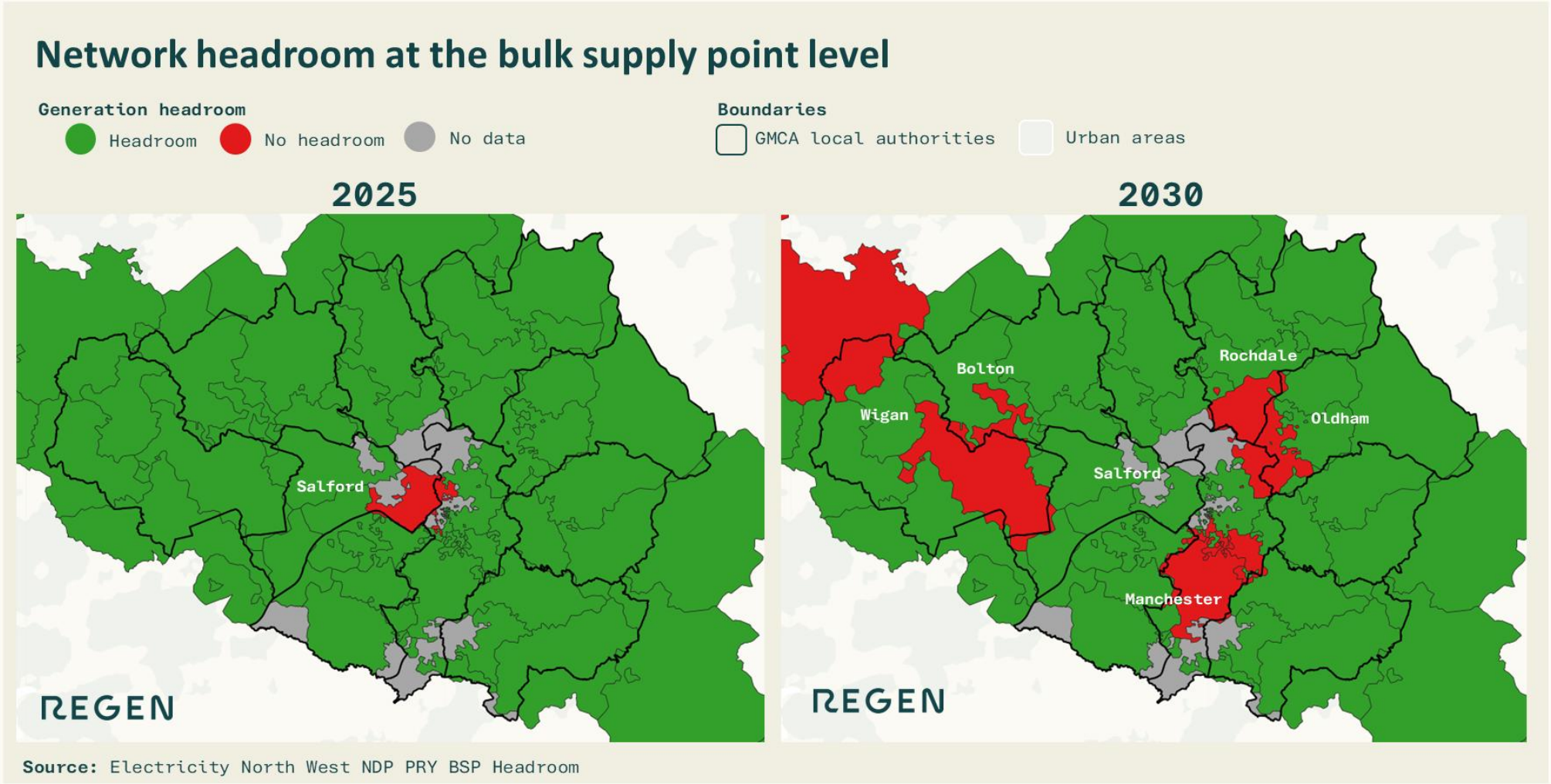


Figure 17: Map showing headroom availability for the bulk supply point level in GMCA region

Network headroom at the grid supply point level

Materiality headroom status

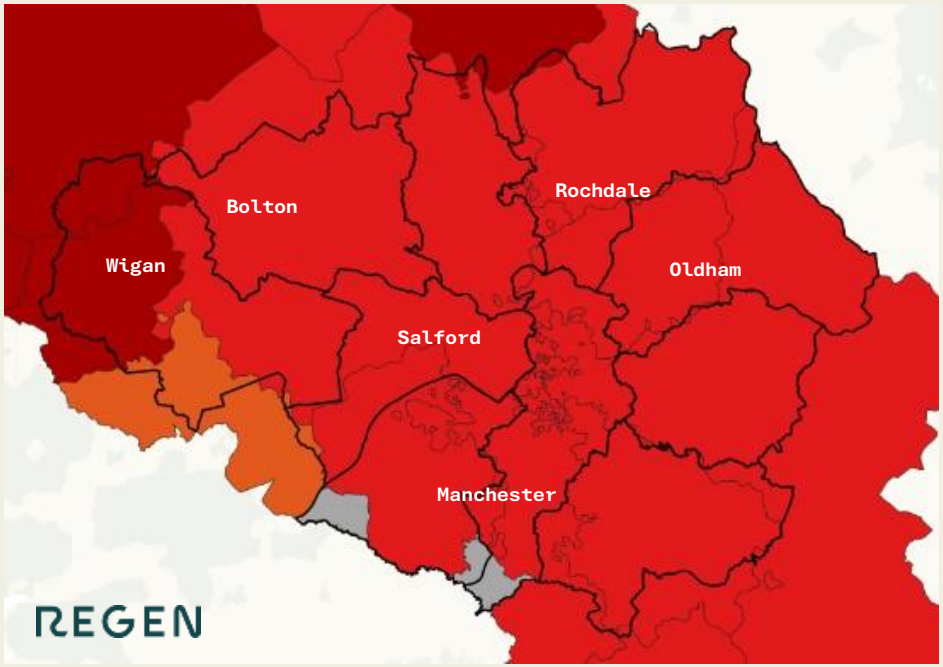
A B C D No data

Boundaries

GMCA local authorities

Urban areas

2025



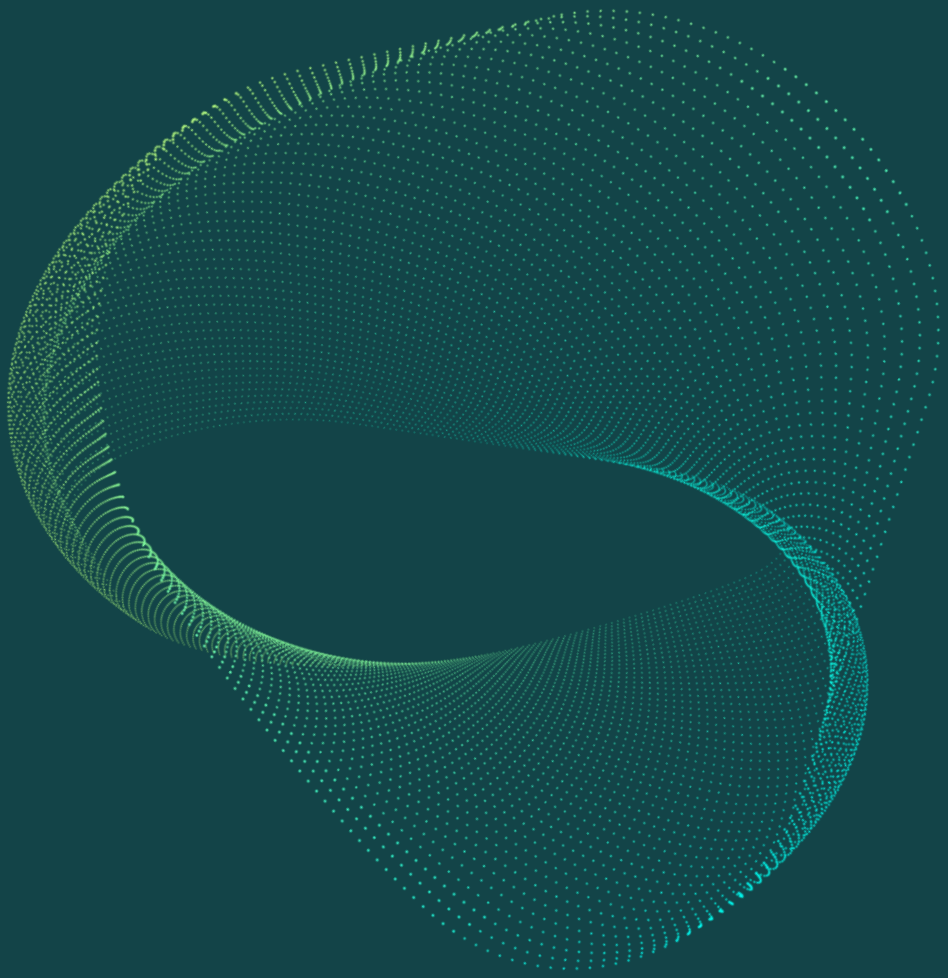
At the grid supply point (GSP) level, headroom availability is categorised by ENW into different materiality headroom statuses according to the available thermal capacity at the transmission network point before a modification application is triggered, whereby an upgrade to the network would be required.

Status:
A – there is spare transmission capacity
B – there is insufficient transmission capacity and modification application will be required to determine the scope of this
C – there is insufficient transmission capacity and existing in progress sites have been identified and are progressing, new sites will require a new modification application
D – not defined on ENW open data portal

Within the GMCA all GSPs have insufficient capacity, and any new projects will require a modification application to assess the scope of network upgrades required. This will likely mean extra costs and longer times to connect for projects over 5 MW

Source: ENWL GSP Heatmap

Figure 18: Map showing headroom availability for the grid supply point level in GMCA region



Regen
Bradninch Court,
Castle St,
Exeter
EX4 3PL

01392 494 399
www.regen.co.uk

August 2025