



Caerphilly County Borough
2nd Replacement Local Development Plan 2020-2035

EB24: Renewable Energy Evidence Paper

October 2026



**Caerphilly County Borough 2nd
Replacement Local Development Plan
2020-2035**

EB24

**Renewable and Low Carbon Energy
Background Paper**

October 2026

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1. Introduction

This paper is one of a series produced as part of the evidence base for the 2nd Replacement Local Development Plan, 2020-2035 (2RLDP). Each topic paper can be read in isolation or together to gain a wider understanding of how the policies and/or allocations in the 2RLDP have been developed to address issues facing Caerphilly County Borough.

The purpose of this paper is to provide further information on the policies relating to renewable energy generation contained within the 2RLDP. It sets out details of the background evidence, much of which is set out in separate, stand-alone reports. This paper provides references to these reports to avoid duplication and repetition. It reflects the position at the date of publication and may be subject to updates and revision as the 2RLDP progresses through the plan preparation process.

2. Planning Policy Context

2.1. National Planning Policy

Future Wales: The National Plan 2040

Future Wales (FW) was published in February 2021 and provides the National Development Framework for Wales. It recognises that Wales has significant opportunities to generate renewable energy and notes that Welsh Government is committed to maximising this potential to achieve the goal of Net Zero by 2050. The policy framework focuses on proposals for large-scale energy developments, which are classified as Developments of National Significance (DNS) and are determined by Welsh Ministers.

Future Wales has set out ten large 'Pre-Assessed Areas' for wind energy across the country, with most of Area 10 being located within Caerphilly County Borough. Wind energy farms located within these pre-assessed areas possess "a presumption in favour of development (including repowering), subject to criteria in Policy 18" (Future Wales: The National Plan, Policy 17, pg. 95, 2021).

Policies 17 and 18 of FW contain specific spatial and criteria-based policies respectively, that should be considered in the determination of DNS proposals. Future Wales also identifies Heat Network Priority Areas, with specific details of these being noted within Policy 16. Caerphilly town is identified as a Heat Network Priority Area.

Planning Policy Wales Edition 12 (PPW12)

Planning Policy Wales provides the legislative framework for the planning system in Wales. PPW12 sets out Welsh Government's policy aspirations for energy through an energy hierarchy. Reducing energy demand sits at the top of the hierarchy and forms the main priority for energy development in Wales, followed by efficient energy usage, renewable energy generation, minimising the carbon impact of traditional forms of energy generation and minimising the extraction of carbon intensive energy materials sitting at the bottom of the hierarchy.

The Welsh Government has set targets for the generation of renewable energy:

- For Wales to generate 70% of its electricity consumption from renewable energy means by 2030.
- For one gigawatt of renewable energy capacity in Wales to be locally owned by 2030, increasing to 1.GW by 2035.
- For new energy projects to have at least an element of local ownership.

PPW12 recognises that the planning system in Wales has an active role to help ensure these targets are delivered, in terms of new renewable energy generation capacity and the promotion of energy efficiency measures in existing and new buildings.

Welsh Government's Practice Guidance: Planning for Renewable and Low Carbon Energy – A Toolkit for Planners

To ensure Local Planning Authorities (LPAs) contribute to fulfilling the delivery of national renewable energy targets, PPW12 places an emphasis on planning authorities to develop a robust evidence base to inform the development of renewable and low carbon energy generation policies. The Welsh Government's Toolkit for Planners is advocated within PPW12 as an acceptable methodology for developing an evidence base to inform spatially based renewable energy policies and allocations for inclusion in the 2RLDP.

2.2. Regional Planning Policy

At the time of writing, there currently exists no regional legislative framework for renewable energy generation in Southeast Wales. A Strategic Development Plan is currently under preparation within Southeast Wales, incorporating the local authorities of Brecon Beacons National Park, Cardiff City, Vale of Glamorgan, Bridgend, Rhondda Cynon Taf, Merthyr Tydfil, Torfaen, Blaenau Gwent, Newport, Monmouthshire and Caerphilly County Borough. The Strategic Development Plan, upon completion, will provide a regional legislative framework to bridge the gap between current national and local policies.

The SDP is designed to cover planning issues that cross local authority boundaries. Renewable energy is an area that the SDP will cover extensively, due to the nature of renewable energy developments often crossing these local authority boundaries.

2.3. Local Planning Policy

In June 2019, Caerphilly County Borough Council declared a Climate Emergency and committed to making Caerphilly County Borough Council a net-zero carbon local authority by 2030. Following this declaration, a Decarbonisation Strategy and Action Plan were approved in November 2020. The Decarbonisation Strategy focuses on four pillars: Reduce, Produce, Offset and Buy, all directed towards the goals of reducing energy usage, generating 'green electricity' and considering embedded carbon within the procurement process, to achieve net-zero by 2030. The Action Plan outlines specific decarbonisation related projects to work towards net-zero also.

An Energy Prospectus was produced by the Decarbonisation team in 2020 alongside the Decarbonisation Strategy. The Energy Prospectus aims to highlight key energy projects that the authority is investigating, to further advancements towards Caerphilly County Borough's specific objective of becoming Net Carbon neutral by 2030. The Prospectus outlines how the four pillars identified by the Council's 2009 Carbon Reduction Strategy are still crucial to achieving this goal. The four pillars are: Good Housekeeping, Invest to Save, Asset Management, and Renewable Technologies, which all aim to combat carbon emissions from everyday carbon reduction techniques to larger scale projects through the implementation of renewable technologies within schools and offices within the borough.

The Energy Prospectus further outlines four key areas which can massively assist the push towards Net Carbon neutral by 2030. These areas are Solar Power Generation, Anaerobic Digestion, Wind Turbines and an Electric Vehicle Strategy and Action Plan. These areas range from short to long term implementation, from 24 to 60+ months.

Following the Council's climate emergency declaration, a 2050 Net Zero Strategy was formulated within the council that aims to synchronise net-zero efforts into a more streamlined process, through the collaboration of every individual, business and organisation within Caerphilly County Borough focusing their efforts to maximise carbon reduction.

3. Evidence Base

Caerphilly's Renewable and Low Carbon Energy Assessment (RLCEA) October 2020

Following the methodology set out in Welsh Government's Toolkit as mentioned above, the Caerphilly Renewable and Low Carbon Energy Assessment (RLCEA) was produced by the Carbon Trust in December 2020 and assesses the current capacity for renewable energy within the county borough and the potential renewable energy capacity for the future, in line with Net Zero Targets. The assessment also includes theoretical capacities for renewable energy generation. The capacities for such are outlined through the following technologies:

- Wind Energy
- Ground Mounted Solar Photovoltaics (PV)
- Biomass
- Energy from Waste and Anaerobic Digestion
- Hydropower
- Rooftop Solar PV
- Heat Pumps

The RLCEA concludes that, to meet national targets, “the level of renewable/low carbon energy generation needs to increase approximately sixteen times from existing levels. To achieve 70% of current electricity demand from renewable sources, the renewable electricity generation needs to increase approximately 4.5 times from existing levels” (Carbon Trust, Caerphilly Renewable and Low Carbon Energy Assessment, December 2020, pg. 175.).

The assessment further concludes that solar, and to a lesser extent, wind energy resources are identified as the predominant resources available for future generation. Many areas within the county borough are identified as being less-constrained for ground-mounted Solar PV development. The assessment identifies that the resource potential for other renewable energy generation technologies detailed above is low. Specific potential generation data can be found within the main report, as linked above.

The findings of the RLCEA provided the foundations for the establishment of the 2RLDP's approach to identifying local renewable energy generation targets.

In April 2026, interviews with five different stakeholders: National Grid, RWE, Arup, Cardiff Capital Region and the Mining Remediation Authority were conducted to help inform the identification of specific, defendable and evidenced targets for renewable energy generation within the county borough up to 2035. More information on these interviews can be found within section 6.3 of this background paper.

Local Area Energy Plan (LAEP)

The Local Area Energy Plan was produced by Arup, The Carbon Trust and Afallen on behalf of CCBC in 2023. The LAEP collates evidence to identify the most effective route for the authority to reach a net-zero target, in line with national renewable energy generation targets. The LAEP works in conjunction with two other documents: a

Technical Report, containing specific graphs and charts, and a Renewable Investment Prospectus, which highlights short-term regional and local renewable energy opportunities.

4. Updated Position

4.1. Capacity

Following the completion of the RLCEA in October 2020, the current and future capacity for renewable and low carbon energy generating technologies within Caerphilly County Borough was identified to help inform the renewable energy generation targets in preparation of the 2RLDP. Full details of the capacities can be found within the RLCEA report, through the hyperlink contained within Section 3.1.

To provide context, the identified capacity of each renewable energy generation source within CCBC as of October 2020 are as follows:

- Wind: **21.2 MW**
- Solar PV (ground mounted): **39.7 MW**
- Solar PV (roof mounted): **9.1 MW**
- Anaerobic Digestion (power): **1.9 MW**
- Biomass (power): **0.1 MW**
- Landfill gas: **0.05 MW**

- Total estimated power generation: **72.1 MW**

In terms of estimated annual energy generation of the above renewable technologies, these estimations are as follows:

- Wind: **50,185 MWh p.a.**
- Solar PV (ground mounted): **34,738 MWh p.a.**
- Solar PV (roof mounted): **8,011 MWh p.a.**
- Anaerobic Digestion (power): **14,980 MWh p.a.**
- Biomass (power): **946 MWh p.a.**
- Landfill gas: **263 MWh p.a.**

- Total estimated annual energy generation: **109,122 MWh p.a.**

The RLCEA also identified the capacities of low carbon energy generating technologies, as follows:

- Heat pumps: **0.5 MW**
- Biomass (CHP heat): **0.5 MW**
- Biomass (heat): **8.3 MW**

- Anaerobic Digestion (heat): **0.5 MW**
- Solar Thermal: **0.7 MW**
- Total estimated heat generation: **10.6 MW**

The estimated annual energy generation of the above low carbon energy generating technologies is as follows:

- Heat pumps: **584 MWh p.a.** (net thermal benefit using a Seasonal Preference Factor of 3, i.e. the energy generation is reduced by the electrical input)
- Biomass (CHP heat): **1,524 MWh p.a.**
- Biomass (heat): **21,928 MWh p.a.**
- Anaerobic Digestion (heat): **2,190 MWh p.a.**
- Solar Thermal: **1,226 MWh p.a.**
- Total estimated annual energy generation: **27,453 MWh p.a.**

4.2. Wind

The RLCEA identified the potential capacity of wind energy generation through an in-depth study of 26 'clusters', an amalgamation of less constrained areas for wind turbine implementation. These clusters are located across the county borough, the largest of which located to the north-west of Caerphilly town, with other large areas located east of Newbridge and surrounding the town of Rhymney in the north of the borough. Most of the clusters are in the areas north of Bargoed and Aberbargoed. Detailed maps and tables outlining the wind capacities of each cluster and further information can be found from pages 51-56 of the RLCEA.

4.3. Solar

A strategic high-level assessment was also conducted to identify accessible large-scale solar power potential within the borough. The study identified that there currently exists 40MW of existing ground mounted solar PV within the borough, which means the remaining high-level capacity that could be exploited within the study area is 2,622MW. Further information on the capacity of solar energy generation within the borough can be found on pages 58-68 of the RLCEA.

4.4. Biomass

The study undertaken within the RLCEA to identify Biomass energy generation capacity centred around the estimation of land area available within the borough for wood fuel and the maximum theoretical land area available to grow crops used for Biomass energy generation. The study identified that most of the land within the county borough is suitable for the growing of energy crops, with three large areas unsuitable

for such located west of Caerphilly town, north of Pontllanfraith and west of Rhymney. Full details of the study can be found from pages 69-74 of the RLCEA.

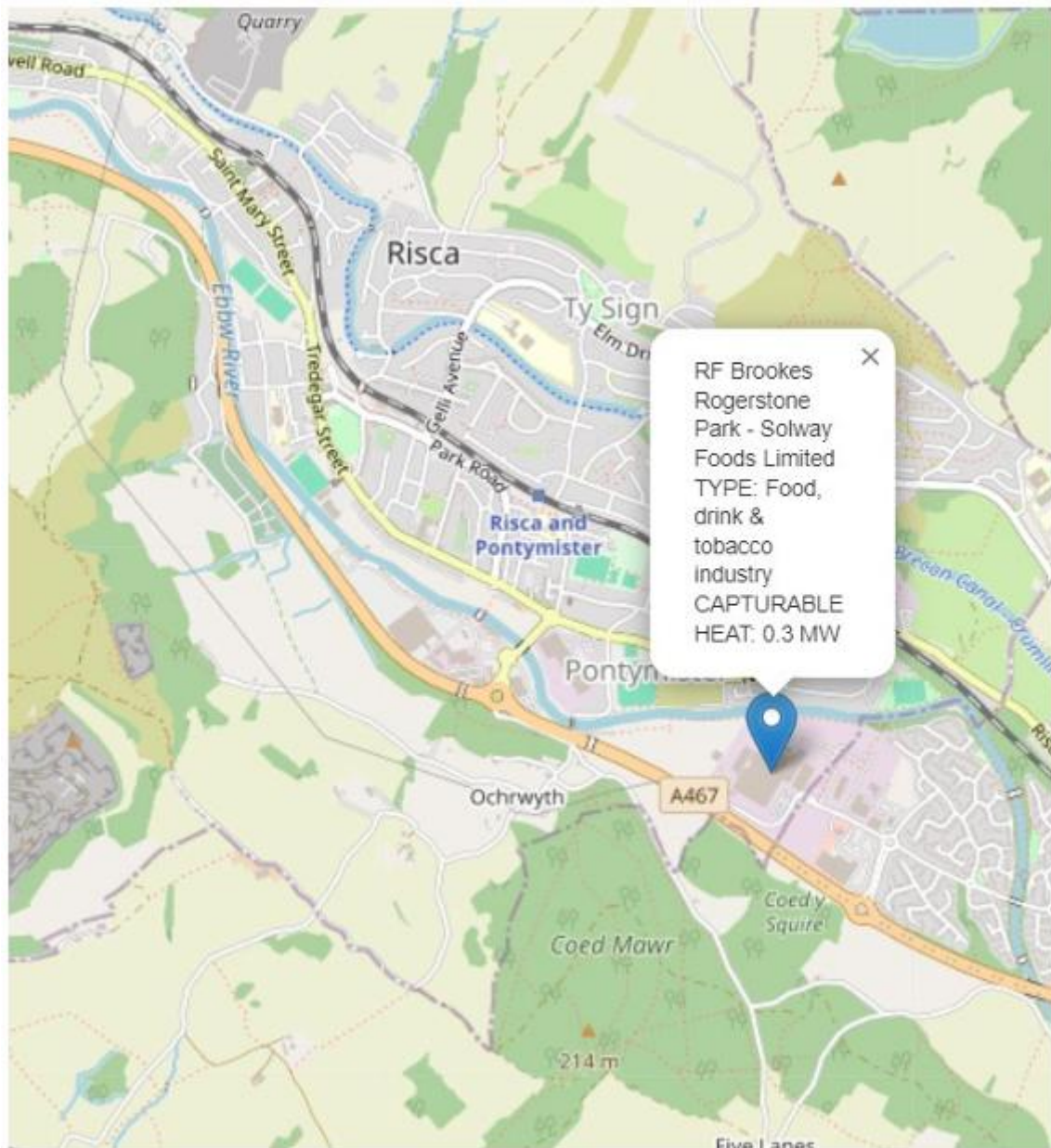
4.5. Heat Networks

The RLCEA does not make specific reference to Heat Network capacity, as there currently exists no District Heat Network (DHN) potential within Caerphilly County Borough. Policy 16 of Future Wales concerns Heat Networks, which states that, within priority areas, planning authorities should identify opportunities for District Heat Networks and plan positively for their implementation.

However, as identified within the RLCEA, Caerphilly County Borough currently possesses no District Heat Network Potential. This conclusion is supported through the LAEP Technical Summary.

The Technical Summary notes that there exists only one potential waste heat source site identified across the county borough, located to the south-east of Risca and Pontymister, in Rogerstone Park Industrial Estate. Exact location of this site is detailed in Figure 1 below:

Figure 1: Waste Heat Source Identified in the LAEP Technical Summary

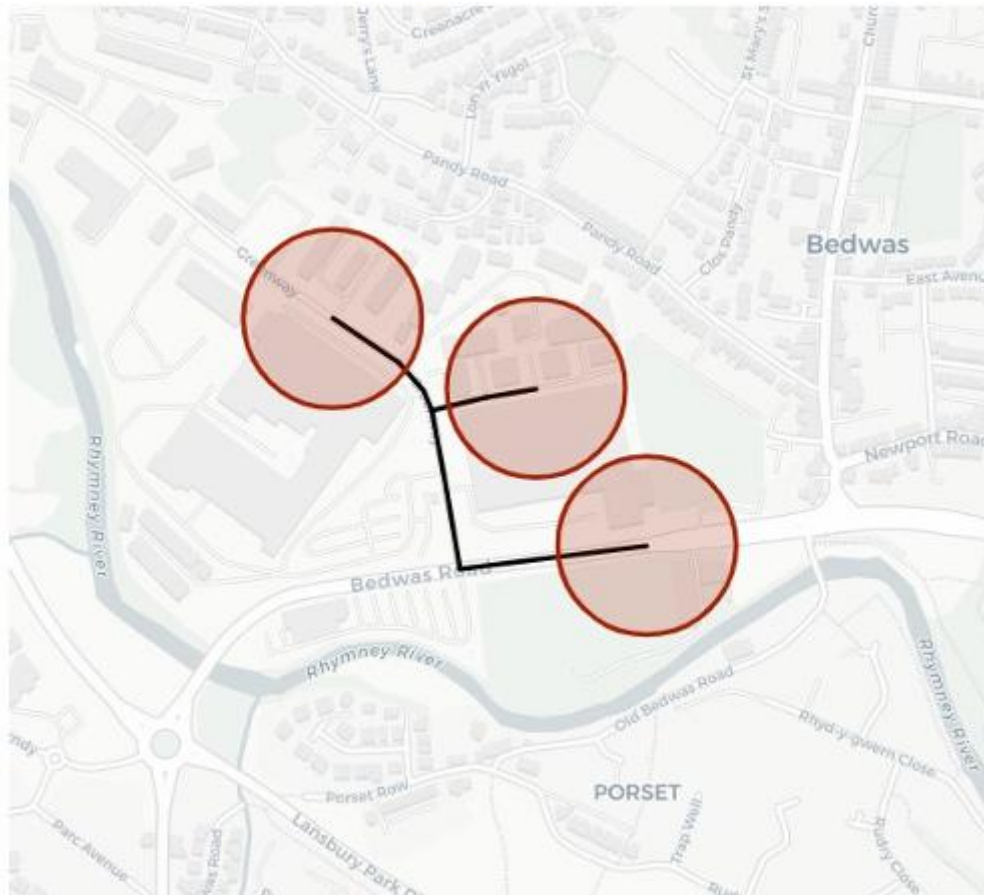


Furthermore, the Technical Summary further identifies four potential heat networks across the borough, which are consistent across both high and low demand scenarios. The identified heat networks are as follows:

- Blackwood Network 1: Connecting Buildings in Dyffryn Business Park
- Blackwood Network 2: Connecting Buildings in Blackwood Business Park
- Caerphilly Network 1: Connecting Buildings in Bedwas House Industrial Estate
- Caerphilly Network 2: Connecting Buildings in Pontygwindy House Industrial Estate

The Technical Summary provides an example map of what the Caerphilly Network 1 could potentially look like at Bedwas House Industrial Estate, detailed in Figure 2 below:

Figure 2: Map of Caerphilly Network 1: Connecting Buildings in Bedwas House Industrial Estate



Despite the Technical Summary's identification of one potential waste heat source site and four potential heat network sites, there has been no capacity for a large-scale DHN identified, which aligns with the findings contained within the RLCEA.

Caerphilly County Borough possesses limited scope for a DHN due to the lack of large-scale, high-heat producing development which could be offset into a DHN. Neighbouring authorities such as Cardiff possess greater capacity for a DHN, due to the existence of the Cardiff Energy Recovery Facility (ERF), located north-east of Cardiff Bay. The ERF is the largest waste treatment facility in Wales, and as such provides excellent capacity to offset the facility's generated heat into a DHN.

Caerphilly County Borough may, however, possess potential capacity for a DHN through the existence of exemplary minewater sites. The capacity for these sites to offset heat into a DHN is in feasibility stage as of October 2026, however, and is unlikely to materialise during the plan period of the 2RLDP.

4.6. Minewater

There currently exists no potential capacity or output regarding the use of minewater as a renewable energy source within Caerphilly County Borough. The RLCEA does however refer to the theoretical implementation of one, drawing on several examples where minewater has been used as a reliable renewable energy source. The RLCEA refers to an operational minewater heat pump providing heat to a farm complex in Crynant, Neath. It is also noted that within South Wales, the Seren research project has assessed the heating potential of the South Wales coalfield and has suggested that disused mines could provide the potential to heat at least 20,000 homes (Carbon Trust 2020). Research into the practicalities of accessing and distributing this heat is ongoing, with Bridgend County Borough Council pioneering efforts by developing a minewater heat network project in the Upper Llynfi Valley.

4.7. Grid Connectivity

Table 1 provides details of the bulk supply point (BSP) and primary substations which serve the county borough. The majority of BSPs and primary substations listed operate cross-boundary and as such it cannot be assumed that available capacity would be allocated to projects within Caerphilly County Borough alone. BSPs step down voltage from 132kV to 33kV, while primary substations step down voltage from 33kV to 11kV. BSPs also usually supply a larger network area than primary substations. Typically, the smaller a project is, the more likely it is to be connected to a primary substation, although there are multiple factors that define where a project ultimately connects to, including distance to substation and the number of generators already connected. The details in Table 1 are taken from NGED's network capacity map ([National Grid - Network Opportunity & Development Map Application](#)) and as identified within the method are indicative in nature and cannot necessarily be relied upon (NGED, 2026). A glossary of terms is available within the map application.

Generation headroom is calculated using up-to-date quotation statistics incorporating connected generation, accepted but not yet connected generation and quoted generation figures. These figures will regularly change as quotations are issued and expire. Currently the map cannot differentiate between multiple offers for the same site inflating the overall connected generation figure and suggesting negative headroom in some instances. Generation headroom is calculated using reverse power capabilities of each site. Where this figure was missing in the LTDS an assumed value of 50% of firm capacity has been used (NGED, 2026).

It also indicates the level of total site capacity that is still available for these factors using a colour-coding system, for primary substations the following are relevant:

- Green: at least 20% total site capacity is still available,
- Amber: 10-20% total site capacity still available

- Red: less than 10% site capacity is still available

And for the bulk supply substations, the following are relevant:

- Green: at least 15% total site capacity is still available,
- Amber: 5-15% total site capacity still available
- Red: less than 5% site capacity is still available.

To understand the costs, complexity and infrastructure requirements for a specific connection, a developer would need to contact NGED who would undertake development specific studies to understand the network implications of a proposal.

To minimise the risk of unviable projects, prospective developers should begin communicating with NGED as early as possible. Even if there is no available capacity at the nearest connection point, NGED will be able to advise on upcoming network infrastructure upgrades that may make a site viable in the future.

Some renewable energy generation projects can be developed without a grid connection utilising private wire arrangements which could give developers the option to meet onsite demand within a highly constrained network. Off-grid renewables require close balancing of generation and demand alongside other technical considerations. NGED should be contacted when considering potential connections of this kind.

Substation	Type	Headroom RAG		Headroom MW	
		Generation Connected	Generation Contracted	Generation Connected	Generation Contracted
Abertysswg	Primary			10.9	10.8
Pengam Grid	Primary			33.6	0
Pontllanfraith	Primary			11.9	11.8
Crumlin	BSP			19.3	0
Cwmfelinfach	Primary			9.1	9.1
Trethomas	Primary			11.3	0
Caerphilly	Primary			18.6	9.3
Energlyn	BSP			29.8	29.8
Merthyr East	BSP			30.8	0
Tredegar	Primary			4	0
Ebbw Vale	BSP			35	0
Abertillery	Primary			11.7	11.7
Cwmbran	BSP			31.6	0
Llantarnam	BSP			30.3	30.2
Rogerstone	Primary			34.7	34.7
St Mellons	Primary			15.2	15.2
Llanishen	Primary			27.8	27.8
Nantgarw	BSP			29.9	29.9
Nelson	Primary			0	0
Nantwen	Primary			9.7	9.7

Table 1: BSP and Primary Substations within the county borough

5. Candidate Site Assessment

5.1. Submitted Sites

As part of the preparation of the 2RLDP, a significant number of candidate sites have been submitted for consideration, varying a wide range of uses, predominantly residential. There have been a select number of candidate sites submitted for renewable energy. Much of the potential areas for renewable energy generation, specifically wind energy, lie across local authority boundaries, as per the 'Pre-Assessed Areas' identified within Future Wales. The submitted candidate sites for renewable energy are as follows:

1st Call for Sites

Site Reference	Site Name	Proposed Use	Information
HOV002	Land at Markham Colliery	Green Energy	A mixed-use comprising leisure, renewable energy and potentially some units for education/training. Site Area: 5.18 Ha Proposal: Two wind turbines and solar panels Land Grade: Not BMV Grade
RNC026	Twyn Gwyn Farm	Agricultural	Renewable Energy Site Area: 29.59 Ha Land Grade: Not BMV Grade

Table 2: Renewable Energy Sites submitted within the 1st Call for Sites

2nd Call for Sites

No proposed renewable energy sites submitted within the second call.

3rd Call for Sites

Site Reference	Site Name	Proposed Use	Information
HOV202	Green Meadow Farm, Rhymney (Site 1)	Renewable Energy (Solar)	Renewable Energy generation which includes Solar PV. Site Area: 15.5 Ha Land Grade: BMV Grade 4: Poor Quality Agricultural Land
CB214	Ty Fry, Nantgarw	Solar Farm	Provision of solar panels as part of a larger solar farm. Site Area: 8.4 Ha Land Grade: BMV Grade 3b: Moderate Quality Agricultural Land
CB216	Ty-Llwyd, Groeswen Road	Solar Farm	Provision of solar panels as a standalone or part of a larger solar farm. Site Area: 30.46 Ha Land Grade: A mix of BMV Grade 3b: Moderate and 4: Poor Quality Agricultural Land
CB217	Land at Ysguborwen, Groeswen Road	Solar Farm	Provision of solar panels as a standalone or part of a larger solar farm. Site Area: 16.57 Ha Land Grade: A mix of BMV Grade 3b: Moderate and 4: Poor Quality Agricultural Land

Table 3: Renewable Energy Sites submitted within the 3rd Call for Sites

The RLCEA has provided recommendations regarding site allocation and design for potential renewable energy sites. These recommendations are detailed in section 7.3 of this background paper.

6. Developing Renewable Energy Targets

The ongoing development of CCBC's renewable energy targets for the 2RLDP is a crucial element of establishing the renewable energy capacity of the borough up until 2035. The targets are informed through a range of stakeholder engagement, particularly interviews taking place in April 2026, with a variety of external stakeholders from numerous public and private organisations participating. The overarching aim of

the development of our renewable energy targets is to establish a precise percentage figure for renewable energy generation up until 2035, a figure that can not only be feasibly achieved but also comprehensively defended during the examination period, with evidence to support our targets.

6.1. Baseline

The RLCEA outlined various maximum resource and capacity figures within Table 41: Potential Renewable Energy Targets for Consideration. The key figures taken from Table 41 are as follows:

Estimated Maximum Resource

Wind: **133 MW**

Ground mounted solar PV: **2,460 MW**

Roof mounted solar PV: **350 MW**

Current Installed Capacity (as of December 2020)

Wind: **20.3 MW**

Ground mounted solar PV: **39.7 MW**

Roof mounted solar PV: **9.1 MW**

Scenario 7 (Target as 50% of maximum capacity)

Wind: **66 MW**

Ground mounted solar PV: **1,230 MW**

Roof mounted Solar PV: **175 MW**

These figures represent a theoretical baseline for the identification of the renewable energy generation targets up to 2035, to be included within the 2RLDP.

These figures have been considered alongside all large-scale DNS planning applications received by the LPA since 2018, along with all smaller renewable energy planning applications, to identify the latest installed capacity within the borough, as of June 2026. These figures, alongside those identified within the RLCEA, have been carefully considered to formulate our renewable energy generation targets up to 2035.

6.2. Stakeholder Engagement

Stakeholder engagement was crucial in the development of our renewable energy targets for the 2RLDP. The focus of the stakeholder engagement was conducted through targeted interviews, which are detailed in the following section.

6.3. Targeted Interviews – April 2026

In April 2026, five interviews were conducted with the following stakeholders:

- National Grid
- RWE
- Arup
- Cardiff Capital Region
- The Mining Remediation Authority (MRA)

These interviews were conducted on an informal, conversational basis, with set questions identified through collaboration between the Strategic Planning and Decarbonisation teams. Specific questions catered towards minewater were used during the interview with the MRA. The conversational basis of the interviews allowed the stakeholders to elaborate on the set questions more freely, in turn providing the LPA with comprehensive information and expertise regarding the current and potential capacity of renewable energy technologies within the county borough.

The interviews were conducted via Microsoft Teams, with members of the Strategic Planning and Decarbonisation teams attending, along with representatives of the relevant stakeholders. The interviewed representatives of the organisations ranged from one to four participants per organisation, due to the limited availability of certain representatives when the interviews were taking place.

The condensed, anonymised transcripts from these interviews can be found in Appendix 1 of this background paper.

The analysis of these five interviews has been crucial for the generation of the renewable energy targets for the 2RLDP. The expertise of the representatives is fundamental to these targets and the decision to opt for criteria-based policies as opposed to Local Search Areas (LSAs) within the plan, as criteria-based policies with careful policy wording were frequently identified as being the best approach for maximising renewable energy development within the county borough up until 2035. Criteria-based policies allow for more flexibility in the location of renewable developments, as land constraints were identified as a core barrier to renewable deployment, therefore nullifying the effectiveness of LSAs as a policy option.

Furthermore, a criteria-based policy approach helps to accommodate the increasing scope of minewater as a renewable heat source. The locations in which minewater can be viably used as a renewable technology shall be identified via opportunity mapping on QGIS, and applicants must show that they have reasonably considered minewater as a technology option through the criteria-based policies contained within the 2RLDP.

7. Recommendations

7.1. Renewable Energy Targets/Generation

In preparing targets for renewable energy generation, CCBC considered modelling completed through the RLCEA, the Local Area Energy Plan (LAEP), approved planning applications and grid constraints to determine low and high targets for the plan period. This evidence base has identified ground mounted solar PV and wind as the dominant resources within the county borough. Targets for these technologies have been set considering the resource available. Rooftop solar PV and heat pump targets have been aligned with RLDP growth levels. High and low target ranges have been included to support flexibility and allow for constraints and suitability factors.

Consultation with key stakeholders has determined that there are few opportunities for solely grid connected >2MW wind turbine developments outside of what has already been approved and awaiting connection within the plan period due to land availability within the less constrained areas and local generation grid capacity. Currently approved installations exceed the Estimated Theoretical Maximum (ETM) for Caerphilly within the RLCEA (see section 6.1). It should be noted that the ETM was calculated assuming 2MW turbines and did not consider repowering of existing installations.

The low target for wind generation reflects currently installed capacity and approved planning applications anticipated to be constructed and connected within the plan period. The high target reflects a more aspirational target for wind generation considering the larger turbines specified within planning applications. Estimates of generation potential were calculated using actual generation data of existing installed capacity available through the National Grid Energy Distribution (NGED) Distribution Future Energy Scenarios (DFES) modelling data.

The ETM for ground mounted solar generation was updated through the LAEP process to exclude land classification grades 1-3 from the less constrained areas for solar identified in the RLCEA. Similarly to wind, consultation with key stakeholders has determined that there are few opportunities for solely grid connected large scale solar developments outside of what has already been approved and awaiting connection within the plan period due to land availability within the less constrained areas and local generation grid capacity.

The low target for ground mounted solar generation reflects currently installed capacity and approved planning applications anticipated to be constructed and connected within the plan period. The high target reflects a more aspirational target for solar capacity. To estimate the generation potential of additional capacity, it was assumed that solar radiation within the county borough would remain relatively constant through the plan period.

Targets for Roof Mounted Solar PV relate to new domestic developments only linked to the RLDP growth strategy. Approximately 2,767 new housing units have been identified in allocations within the plan. The targets were calculated assuming 4kWp solar PV arrays aligned to the LAEP methodology with generation estimated using solar radiation data for the borough. The low target assumes 50% availability and uptake with the high target assuming 100% availability and uptake.

To meet national targets for low carbon energy generation and publicly owned energy, the rates at which existing domestic and non-domestic properties utilise Roof Mounted Solar PV will need to rise within the plan period. LAEP scenario modelling indicated 93MW of additional capacity across all scenarios by 2050. NGED DFES modelling projects between 22MW and 40MW of capacity of domestic generation including existing installations will be connected by the end of the plan period. Assuming installations of 4kWp this equates to 5,500 – 10,000 homes.

There are 345 existing domestic heat pumps installed within Caerphilly County Borough. Assuming 5KW of thermal capacity per dwelling and a co-efficient of performance of 3 this translates to 1.73MWth of installed capacity.

Utilising the methodology within the RLCEA as outlined in the paragraph above, targets for heat pumps for the 2,767 new housing units have been set aligned to the RLDP growth strategy. Annual heat generation has been estimated using a range of 4 – 8 MWh per dwelling per annum, reflecting the expected heat demand of highly efficient Future Homes Standard dwellings and recognising that the precise dwelling mix and design of the allocated units is not yet known.

The low target for heat pumps represents a heat demand of 4MWp.a. per unit with 50% uptake with the high target representing a heat demand of 8MWp.a. per unit with 100% uptake. As with Roof Mounted Solar PV, these targets relate to new developments only.

To meet national targets for the installation of heat pumps in Wales by 2035, the rate of installations will need to rise across the plan period. NGED DFES modelling projects 2,200 – 11,000 heat pumps will be installed by the end of the plan period. This aligns with LAEP targets for 2030 of 7,000 – 11,000 buildings with heat pumps installed.

7.2. Heat Networks

Despite the limited capacity for heat networks identified within the county borough through the RLCEA and LAEP, the future potential for heat networks to be incorporated into large scale developments should be considered throughout the 2RLDP plan period.

7.3. Candidate Sites

Candidate sites have been assessed utilising the methodology in the RLCEA to provide indicative theoretical capacity rather than confirmed developable capacity. Detailed consideration of site-specific constraints, landscape and cumulative effects, grid capacity and competing land uses would be required before the scale and configuration of development could be confirmed. Grid constraints have been assessed utilising the NGED Network Opportunity and Development Map but conversations with NGED for development on any site are recommended at the earliest opportunity.

The RLCEA wind methodology excludes constrained land, including 500 m around domestic properties, specified buffers around buildings, roads and railways, 50 m around woodland and water bodies, areas with wind speeds below 6.0 m/s at 45 m, and specified environmental, landscape and heritage designations.

For solar, relevant constraints include slope and aspect, environmental and landscape designations, heritage designations and infrastructure constraints, including proximity to railway infrastructure. The assessment subsequently removed areas considered unsuitable through visual inspection, land too small to accommodate 0.5 MW, and land within Development Advice Map flood-risk Zones C1 and C2. Best and Most Versatile agricultural land was not treated as an absolute exclusion but was considered within the subsequent scoring methodology.

Grid Connectivity

Site Reference	BSP	Primary Substation	Generation Headroom (MW)	Indicative Maximum Theoretical Potential (MW)
HOV002	Pengam Grid BSP	Pengam Grid	0	3
RNC026	Crumlin / Pengam Grid BSP	Pontllanfraith / Pengam Grid	11.8 / 0	16.9
HOV202	Dowlais Grid	Abertywsswg	10.8	8.9
CB214	Nantgarw Grid	Nantgarw Primary	29.9 (BSP)	4.8
CB216	Nantgarw Grid	Nantgarw Primary	29.9 (BSP)	17.4
CB217	Nantgarw Grid	Nantgarw Primary	29.9 (BSP)	9.5

Table 4: Grid Connectivity for Candidate Sites

HOV002

The RLCEA assessed wind resource using a typical turbine capacity of 2 MW. While the Welsh Government Toolkit methodology applies an indicative capacity density of 10 MW/km², equivalent to five 2 MW turbines per km², the RLCEA recognises that applying this density to small parcels can result in theoretical capacities of less than a

single turbine. It therefore also applies a turbine-count methodology whereby an area smaller than 0.2 km² (20 ha) may accommodate a single 2 MW turbine, with the full 0.2 km² required for each additional turbine.

On this basis, a 5.18 ha parcel identified as less constrained could have a theoretical wind capacity of 2 MW, equivalent to one turbine, subject to site-specific assessment and confirmation that the turbine and associated infrastructure can be accommodated within the applicable constraints.

For ground-mounted solar PV, the RLCEA applies an indicative land requirement of 1.75 ha per MW. A 5.18 ha area would therefore have an indicative theoretical capacity of approximately 2.96 MW ($5.18 \div 1.75$), or approximately 3 MW of solar PV.

The key constraint for this site is generation headroom available at the primary substation and BSP. Current network development plans available from NGED recommend a solution for a new primary substation out of the adjacent Crumlin BSP.

This site is likely to be allocated for mixed-use comprising leisure, renewable energy and rural skills uses.

RNC026

The site extends to approximately 29.59 ha. The RLCEA assesses wind capacity using a typical turbine capacity of 2 MW and an indicative density of 10 MW/km². To account for smaller parcels, the RLCEA also applies a turbine-count methodology which allows an area smaller than 0.2 km² (20 ha) to accommodate a single 2 MW turbine, with the full 0.2 km² required for each additional turbine. On this basis, 29.59 ha of less-constrained land would have an indicative theoretical capacity of one 2 MW wind turbine, subject to site-specific assessment and confirmation that the turbine and associated infrastructure can be accommodated within the applicable constraints.

For ground-mounted solar PV, the RLCEA assumes a land requirement of 1.75 ha per MW. Applying this methodology to 29.59 ha gives an indicative theoretical capacity of approximately 16.91 MW ($29.59 \div 1.75$).

The key constraint for this site is generation headroom available at the primary substation and BSP. Current network development plans available from NGED recommend a solution for a new primary substation out of Crumlin BSP and transfer of existing generation out of the group to avoid greater works.

Insufficient supporting information has been submitted to support the candidate site, and therefore the site is not being considered for allocation.

HOV202

The site extends to approximately 15.5 ha. The RLCEA uses an indicative land requirement of 1.75 ha per MW for ground-mounted solar PV. Applying this

methodology to the site's 15.5 ha gives an indicative theoretical capacity of 8.86 MW ($15.5 \div 1.75$), or approximately 8.9 MW.

The RLCEA's wind methodology indicates that an area smaller than 20 ha can theoretically accommodate a single 2 MW turbine. The site could therefore have a theoretical wind capacity of 2 MW under this methodology.

There is indicative headroom capacity at the primary substation for this site. NGED are progressing a reinforcement scheme to build a new 33kV circuit between Dowlais BSP and Abertysswg. This will alleviate first and second circuit outage constraints in the Dowlais 33kV network. Additionally, to accommodate forecasted load growth at Abertysswg, NGED have recommended to replace the primary transformers with 12/24 MVA units.

Insufficient supporting information has been submitted to support the candidate site, and therefore the site is not being considered for allocation.

CB214

The proposed site extends to approximately 8.4 ha and has been promoted for solar energy development. The RLCEA uses an indicative land requirement of 1.75 ha per MW for ground-mounted solar PV. Applying this methodology to the full 8.4 ha site gives an indicative theoretical capacity of approximately 4.8 MW ($8.4 \div 1.75$).

Nantgarw Grid has green indicative generation headroom. However, it should be noted that this BSP sits across Caerphilly, Rhondda Cynon Taf and Cardiff boundaries. Indicative theoretical generation across all 3 candidate sites put forward within this zone exceed the current generation headroom available. NGED network development is focused on the Grid Supply Point for Nantgarw Grid, Upper Boat, at the north of this zone by Mountain Ash and Tonypany primary substations where there is currently no generation headroom.

Insufficient supporting information has been submitted to support the candidate site, and therefore the site is not being considered for allocation.

CB216

The proposed site extends to approximately 30.46 ha and has been promoted for solar energy development. The RLCEA uses an indicative land requirement of 1.75 ha per MW for ground-mounted solar PV. Applying this methodology to the full 30.46 ha site gives an indicative theoretical capacity of approximately 17.4 MW ($30.46 \div 1.75 = 17.41$ MW).

Nantgarw Grid has green indicative generation headroom. However, it should be noted that this BSP sits across Caerphilly, Rhondda Cynon Taf and Cardiff boundaries. Indicative theoretical generation across all 3 candidate sites put forward within this zone exceed the current generation headroom available. NGED network development is focused on the Grid Supply Point for Nantgarw Grid, Upper Boat, at the north of this

zone by Mountain Ash and Tonypandy primary substations where there is currently no generation headroom.

Insufficient supporting information has been submitted to support the candidate site, and therefore the site is not being considered for allocation.

CB217

The proposed site extends to approximately 16.57 ha and has been promoted for solar energy development. The RLCEA uses an indicative land requirement of 1.75 ha per MW for ground-mounted solar PV. Applying this methodology to the full 16.57 ha site gives an indicative theoretical capacity of approximately 9.47 MW ($16.57 \div 1.75$), or approximately 9.5 MW.

Nantgarw Grid has green indicative generation headroom. However, it should be noted that this BSP sits across Caerphilly, Rhondda Cynon Taf and Cardiff boundaries. Indicative theoretical generation across all 3 candidate sites put forward within this zone exceed the current generation headroom available. NGED network development is focused on the Grid Supply Point for Nantgarw Grid, Upper Boat, at the north of this zone by Mountain Ash and Tonypandy primary substations where there is currently no generation headroom.

Insufficient supporting information has been submitted to support the candidate site, and therefore the site is not being considered for allocation.

8. Policy Framework

8.1. 2nd Replacement Local Development Plan (2RLDP) Policies

Renewable energy forms a crucial role in the 2RLDP, in terms of maximising the Council's efforts to work towards becoming a net-zero council by 2030. The complex nature of renewable energy and the immense constraints which can impact development have been navigated through the production of the 2RLDP Renewable Energy Policies.

Through the Targeted Interviews with relevant stakeholders in April 2026, a criteria-based policy was concluded to be the optimal approach. Policy EN1: Renewable Energy Generation dictates where development proposals for renewable energy and associated works will be permitted, subject to criteria. This allows for maximum flexibility for renewable energy development proposals, whilst limiting potential adverse impacts on the natural and built environment of Caerphilly. Policy EN2: Renewable Energy Generation on Large Sites further supports Policy EN1, through requiring development proposals over 100 or more residential units with a total floorspace in excess of 1000sqm to submit an Energy Report, which would determine

the feasibility and viability of incorporating renewable energy generation and other low-carbon technologies into the development.

9. Conclusion

The identification of renewable energy capacity undertaken through this background paper and the supporting documents (RLCEA and LAEP) have contributed to the formulation of the following policies contained within the 2RLDP:

- Policy EN1: Renewable Energy Generation
- Policy EN2: Renewable Energy Generation on Large Sites

The targeted interviews undertaken in April 2026 provided the evidence base for a criteria-based approach for Policy EN1, which dictates where development proposals for renewable energy and associated works will be permitted, subject to criteria. A criteria-based policy allows for maximum flexibility for renewable energy development proposals, whilst limiting potential adverse impacts on the natural and built heritage of Caerphilly County Borough.

Policy EN2 further supports Policy EN1 through determining the feasibility and viability of large-scale developments in excess of 1000sqm incorporating renewable energy generation and other low-carbon technologies into the development.

The renewable energy policies contained within the 2RLDP contribute to the Council's commitment to becoming a net-zero carbon local authority by 2030.

10. Appendices

10.1. Appendix 1

Interview Transcripts

The following transcripts are a condensed, anonymised version of the original transcripts taken directly from the Microsoft Teams transcription tool. These transcripts provide a more concise and formatted version of the original transcripts, with all responses quoted in full and condensed where appropriate.

The interviews have been categorised by number. The dedicated number does not correspond with the order in which the interviews took place.

In some transcripts, the use of the phrases ‘respondent one/two/three’ can refer to different people over the course of the interview. The number associated with the respondent is determined by the individual who responded first, second, and third to that specific question, as opposed to continually referring to the same person throughout the interview.

Interview One

Question One

“So as the national planning policy sets out renewable energy targets for the whole of Wales, which we’re seeking to meet partially through our planning process, **do you have any thoughts on how Caerphilly can balance the need to meet these national targets with our local constraints?**”

The respondent outlined that early analysis through the REA considered the total potential capacity within the area—essentially how much energy generation could realistically be delivered. The subsequent LAEP work then refined this by identifying how much of that capacity would be required to meet local supply and demand.

The difference between these figures represents any surplus capacity that could contribute beyond local needs, helping to meet wider regional or national targets.

Across the broader region, capacity varies: more urban authorities tend to have higher demand but limited space, relying on other areas to contribute, whereas less constrained areas have greater potential to generate surplus. This authority appears to sit somewhere between those extremes, with some available capacity but not at the scale of more rural areas.

Without referring to the detailed figures, it is difficult to assess the exact scale of this surplus or how it could be utilised.

Question Two

“What are your thoughts on the level of ambition that we could potentially set out within the plan? Because like you said, the LAEP is obviously a few different scenarios and sets out what you would need to meet this scenario, this scenario, and so on, whereas the REA sets out the maximum potential capacity within Caerphilly. Do you think we should be ambitious with what we strive for? What are your thoughts on this?”

The respondent stated that a key consideration is the role of the planning authority. While it can shape the policy environment and set direction, delivery ultimately depends on developers bringing proposals forward. This creates a need to balance ambition with realism.

Policy should support and encourage renewable energy development where appropriate, but any target-setting approach may be better framed as a minimum level of delivery rather than an overly aspirational goal.

It is also important to consider spatial factors, including cumulative impacts and how energy development fits alongside other competing land uses across the authority area.

Question Three

“So, there are targets around local community ownership of renewable energy. **Do you have any thoughts on how we can potentially reflect that within the LDP? Do you think we should be setting a target for community ownership, or do you have any other thoughts on how we could drive this within the borough?**”

The respondent outlined that smaller-scale projects are likely to form an important part of the overall energy mix. From a spatial perspective, it is therefore important not to exclude sites simply because they are unsuitable for larger developments.

In relation to community energy, existing national targets are already relatively ambitious and exceeding them locally could risk creating uncertainty for the market unless there is a strong local foundation to support this approach.

Rather than setting additional targets, it may be more effective to align with national policy and focus on enabling delivery through supportive measures. This could include training, engagement, and facilitating access to funding and support mechanisms to encourage community-led initiatives.

Question Four

“With community energy and large developments, we have mentioned the notion that we could build these large developments, but the community ownership may not arise. **Is there a way that the LDP could potentially balance the need for low carbon renewable energy developments with the issues of viability and investment?**”

The respondent identified multiple interacting factors to consider, many of which may change over the lifetime of the development plan. Greater alignment between energy planning and spatial planning at a national level is still evolving, and further work is needed to support this integration.

In principle, clearly identifying preferred locations for renewable energy development can help inform network planning and encourage timely grid investment, improving overall viability. However, this involves a degree of interdependency, as infrastructure investment often depends on confidence that development will come forward.

Given these uncertainties, there is an argument for taking a more ambitious spatial approach, recognising that the plan operates over a long timeframe during which

market conditions, technology, and costs are likely to change. Factors such as energy price fluctuations, grid capacity, and connection requirements will all continue to influence the viability of projects.

One interviewer asks a follow up question regarding the LDP's lifetime and the potential for new and emerging technology to come through that we are not yet currently aware of, and how this could impact issues regarding viability and investment.

To this follow up question, the respondent notes that there is value in avoiding overly prescriptive policy, particularly given the uncertainty around future technological developments. Past work has shown how difficult it is to accurately predict changes, such as increases in turbine size or generation capacity over time.

A more effective approach is to adopt a cautious but forward-looking stance—allowing for technological advancement rather than constraining it through fixed limits. Flexibility is important, as future outcomes are inherently uncertain and likely to differ from current expectations.

Planning policies should therefore be adaptable, supporting both established and emerging technologies. This includes recognising the differing spatial and policy implications of larger-scale infrastructure compared to building-level solutions, while also not ruling out newer models such as community-based energy systems.

Question Five

“We have gone over some of the key barriers that we might experience around renewables, however a key barrier is land availability, for where these developments are deployed. Within the REA and partly within the LAEP, areas are identified as potential renewable sites. **What are your thoughts on designating local search areas specifically for wind and solar developments? Would a criteria-based policy be a better option, where areas aren't pre-allocated, but rather developments are judged against set criteria?**”

The respondent outlined that there are different approaches to spatial policy for renewable energy. In some contexts, such as Scotland, a less spatially prescriptive approach has been used successfully, relying instead on broader policy frameworks to support delivery.

In contrast, Wales has identified specific priority areas based on an assessment of environmental and technical constraints, which must be considered, particularly for nationally significant projects. However, developers often use their own screening tools to assess site suitability in any case.

Unless there is significant competition for land—where spatial prioritisation would help direct development—a criteria-based approach can be simpler and equally effective in guiding renewable energy proposals.

Question Six

“Linked to these constraints is the issue of agricultural land in relation to development and how we can balance agricultural needs alongside rehousing and renewable deployment needs. **Would a local search area or criteria-based policy be better for addressing these issues appropriately?**”

The respondent stated that this issue could be approached in different ways, particularly given that relevant spatial data is often already publicly available. A key choice is whether to map and interpret this information within policy, or to rely on developers to undertake their own assessments and justify proposals.

An important and sometimes overlooked consideration is the practical impact on decision-making. The complexity of policy should reflect the capacity and expertise available within planning teams. Overly technical or detailed requirements may make it difficult to assess applications efficiently, whereas a clearer and more accessible approach can help officers to both challenge unsuitable proposals and support appropriate ones.

Ensuring that policies are proportionate and workable is therefore critical, particularly in the context of limited resources within planning authorities.

Question Seven

“This could be the type of question where you refer us back to the LAEP, but thinking about the balance between ground mounted solar, rooftop solar, onshore winds and other technologies, **how can we approach this balance? Do we set targets for each technology? Or is it better to set an overarching target for renewable energy that can be met by a mix of technologies? What are your thoughts on this?**”

The respondent noted that the technology mix identified through earlier work was largely driven by cost-effectiveness, with some technologies appearing more viable than others in meeting energy demand. Considering this, and acknowledging ongoing changes in technology and viability, a flexible approach to target-setting may be preferable. This could involve setting an overall energy or carbon target that can be met through a range of technologies, rather than prescribing a fixed mix.

Other considerations, such as environmental and landscape impacts, may still influence the preferred balance of technologies. However, there is value in keeping the approach simple and adaptable, particularly given the potential for new technologies to emerge.

There may be a case for distinguishing between different types of deployment, such as rooftop versus ground-mounted systems, especially where there is clear evidence to support uptake (e.g. expected growth in housing). However, encouraging delivery in these areas is likely to require broader supporting measures beyond planning policy alone.

The interviewer makes a comment around a recent identification of public initiatives wanting to be more involved in solar technologies within the borough. The interviewer asks a follow-up question surrounding making a distinction between different solar and renewable technologies that the public could potentially be involved in, as the issue of retrofitting existing buildings is an ongoing issue.

To this question, the respondent outlines that with new developments, you have more control over what is deployed due to the clear reasons and goals for the deployment of such a development. However, with retrofitting, there are more constraints such as buildings in conservation areas, where new renewable energy developments would not usually be permitted. The respondent highlights that it may be helpful to have policies surrounding the retrofitting of existing buildings for renewable energy purposes, to encourage retrofitting and making it more flexible overall.

Question Eight

“Thinking about grid constraints, I won’t ask you for any detail regarding the grid, **but do you have any thoughts on how we could support grid upgrades, and potentially support grid flexibility to make the system more resilient and more robust for the future, to ensure we have the grid capacity to meet future demand for renewable energy technologies?**”

The respondent noted that focusing on new development is a useful starting point, as it introduces additional demand on the energy system. There is an opportunity to reduce this demand at source or incorporate flexibility within these developments.

The level of detail required in energy planning is still evolving, but there may be benefits in identifying, with greater spatial clarity, where and when new renewable energy is likely to come forward.

While there are advantages and disadvantages to spatially defined areas, having a clearer understanding of potential development locations could support more effective grid planning and investment.

Question Nine

“One thing we haven’t touched on is the potential for heat networks. We have had a discussion with another organisation surrounding mine water. Traditionally, we focus mainly on wind, solar, heat pumps etc. **Do you have any thoughts on how we can utilise the LDP to promote the potential development of heat networks or at least promote development that looks at the possibility of deploying heat networks?**”

The respondent outlined that the role of heat networks will depend on local context and the level of existing infrastructure. One approach is to identify specific areas with strong potential, while another is to adopt a more flexible, policy-based framework that supports their development where appropriate.

For larger new developments, heat networks could be considered as on-site solutions, particularly within master-planned schemes. This could be incorporated into policies for new build development through requirements to explore or assess feasibility.

In areas without established networks or firm expansion plans, a less prescriptive approach may be more appropriate than mandating connections. This could include identifying broad zones where heat networks are encouraged, rather than required, allowing for future growth as opportunities emerge.

The interviewer stated that one of the main issues regarding heat networks is having a source of heat, whilst also having off takers for the generated heat. The interviewer provided an example of legislation passed in Germany that effectively requires data centres that produce a certain amount of heat annually to offset this heat into a dedicated heat network.

The respondent stated that, heat networks in the UK have been built based on new developments that have come through, therefore starting heat networks to feed existing homes isn't at the top of their organisation's to-do list. The respondent does state however that if you have big anchor buildings, such as a swimming pool, these can be a starting point for heat networks within existing buildings.

Question Ten

“Thinking about monitoring and reviewing, the plan goes up to 2035 and we obviously can't predict everything that could happen. **Do you have any thoughts on the best mechanism through which we could monitor and review our energy targets, throughout the lifetime of the plan? What could this framework look like?**”

The respondent outlined that it is helpful to distinguish between outputs and outcomes when monitoring progress. Outputs might include measurable indicators such as the number of installations or total installed capacity.

However, it is also important to consider the wider outcomes these contribute to, such as reductions in carbon emissions, impacts on energy costs, improvements to energy security, and local economic benefits.

In practice, not all these indicators may be easy or necessary for a planning authority to measure directly. A pragmatic approach is to make use of existing data sources where possible, drawing on nationally reported statistics rather than duplicating effort, and focusing on metrics that add the most local value.

Closing Statements

The respondent admits that some of their answers may have been on the fence, however this is due to the nuanced nature of renewable energy development.

The respondent did not have any further questions to touch on anything that they believed wasn't covered by the set questions.

Interview Two

Question One

“So national planning policies set out renewable energy targets for Wales as a whole, which local authorities are seeking to meet through the planning process. **Do you have any thoughts on how Caerphilly should best balance the need to meet those targets with some of the local constraints that we experience?**”

The respondent states that it can be a real challenge, and outlines that through their development of local area energy plans, there are a range of different things that local authorities need to implement.

The respondent doubts that there is a clear answer to the question, as differing constraints requires judgement that varies widely.

The respondent admits that this question is beyond their level of expertise and is apologetic that they cannot answer the question confidently.

Question Two

“What are your thoughts on the level of ambition that would be realistic for Caerphilly? We are looking to set some targets for renewable energy, but we have lots of local constraints that need navigating. How do you think we should set our ambition and what do you think is realistic within the plan?”

The respondent prioritised energy as a key enabler of broader development, suggesting that effective energy infrastructure can support wider economic growth and create opportunities for local investment. They acknowledged that this perspective may not be universally shared. They also identified a lack of a clear strategic approach within planning frameworks, particularly in relation to how energy development could function as a foundation for attracting development and investment across different areas.

Question Three

“Following on from that, **do you have a view on how the LDP could support this? Such as the implementation of EV Chargers?**”

The respondent questioned whether reliance on the national grid alone is sustainable, suggesting a stronger focus on developing local energy systems that utilise available resources. They highlighted the value of mapping local energy opportunities and integrating these into development planning. The view emphasised the need for planning policies to encourage on-site generation, energy storage, and smarter local systems rather than defaulting to grid connections. This was framed as particularly important given the growing demand for electricity and the challenges of achieving net zero targets. A more integrated, “two-pronged” approach—combining grid use with

local generation—was seen as necessary to improve resilience, manage demand, and support future development.

Question Four

“So, you have mentioned grid constraints, **what do you see as some of the other main barriers that we might face in deploying either large- or small-scale renewables in Caerphilly?**”

The respondent emphasised the importance of community engagement, noting that misunderstandings and uncertainty around emerging energy technologies can lead to resistance. They highlighted that without effective communication and education, public opposition could become a significant barrier to development, as seen in past planning decisions. The discussion also pointed to the challenge of encouraging behavioural change, with some communities perceiving energy initiatives as imposed rather than collaborative. The need to involve communities more meaningfully in decision-making processes was identified as critical to improving acceptance and supporting the transition.

Question Five

“There are targets for public ownership of energy in Wales, **do you think that having a focus on a realistic target for local community ownership could help overcome some of the hurdles to do with community engagement?**”

The respondent recognises that this is an important area requiring further focus, and initial thinking has begun on how to improve delivery. A key challenge is that large-scale renewable energy projects require significant investment, making it difficult to rely solely on public funding. For example, major tidal energy proposals would likely need substantial private sector involvement.

However, private investment is often driven by profit, meaning financial benefits tend to flow to developers rather than local communities. This creates a tension in ensuring that communities hosting such projects also see tangible benefits. Achieving a fair balance between attracting investment and delivering local value is a key issue. Encouragingly, there are emerging case studies that may help inform better approaches going forward.

Question Six

“**Do you think that the LDP potentially applying policy could help to influence and retain benefits within communities, or even encourage and mandate a level of social value? Is there an LDP mechanism that we could employ to achieve this?**”

The respondent acknowledges that introducing stronger sustainability requirements could potentially discourage investment in some areas, particularly where viability is already challenging. This tension is similar to that seen in housing development, where

adding requirements such as renewable energy technologies or low-carbon heating can reduce developer profit margins.

While there is a strong desire to see higher environmental standards implemented, there is also recognition that a balance must be struck to ensure developments remain financially viable and attractive to investors—especially in areas where investment is harder to secure.

One potential approach under consideration is linking public funding to stricter decarbonisation requirements, ensuring that developments receiving support deliver environmental benefits as part of the agreement. There is also a view that planning policy could play a stronger role in encouraging or requiring these measures.

More broadly, there is an emphasis on moving beyond short-term or tokenistic community benefits and instead ensuring developments provide long-term value, including greater community involvement and a sense of shared ownership over projects.

Question Seven

“You have highlighted about private business and the fact that councils are struggling to deploy these projects. **Is there something that could be included in the LDP around energy security as well? How do you think this could look within the LDP?**”

The respondent asks for clarification on what the interviewer is specifically looking for, to which the interviewer confirms is around energy security, and the notion of building developments ‘locally, for local use’. The interviewer further clarifies by stating about building multiple, smaller technologies to help support energy generation in nearby areas if the technologies in these areas are struggling. The interviewer asks a follow-up question: **do you think there is an opportunity to tie this energy security into the LDP?**

The respondent acknowledges that there is a growing case for local energy generation and storage, particularly as the transition to net zero is expected to place significant pressure on national grid infrastructure. Generating and using energy locally can help improve energy security by giving communities greater control over supply and resilience.

Local systems can also bring wider benefits, including the need for ongoing maintenance and management at a community level. While this introduces additional responsibilities, there are established delivery models—such as energy management companies—that can operate and maintain these systems on behalf of communities, typically at relatively low cost.

One interviewer states that they believe it is also a case of energy protectionism alongside energy security and the continuity of supply.

Another interviewer further recognises the difficulty of unitary boundaries of local authorities in Wales, and how these borders create difficulties for the transfer of energy across county lines.

To this, the respondent states that local energy systems with storage offer flexibility, allowing surplus energy to be exported to the grid at times of highest demand, rather than operating in isolation. This can help support wider network resilience while still delivering local benefits.

Such systems do not need to be confined to administrative boundaries and could operate across wider areas. However, there can sometimes be reluctance to share locally generated energy beyond boundaries, despite the broader interdependence between areas and the fact that resources are routinely shared across regions.

Question Eight

“Thinking about land availability, we have been looking at a couple of different options regarding identifying opportunity for development. Traditionally, we have local search areas, with the REA and the LAEP focusing on spatial areas. We are considering either identifying local search areas based upon the work of the REA and LAEP, or focusing more on a criteria-based policy. **Do you have any thoughts on these approaches and how they might work in the context of the LDP?**”

The respondent suggested that a guidance document supported by a criteria-based approach may be more effective than a fixed assessment study, as it can be more easily updated over time to reflect changes in policy or other conditions. In contrast, they noted that more static assessments can quickly become outdated and require substantial effort to revise.

However, they also acknowledged that such assessments can be valuable in providing clear, visual representations of suitable areas, helping stakeholders better understand the spatial context. Overall, while recognising the strengths of both approaches, they indicated that flexibility and adaptability are important considerations, particularly given past examples of assessment work becoming outdated.

One interviewer provided a follow-up comment surrounding the influx of DNS applications that the local authority has received, and the importance of factoring in the capacity of these applications.

The respondent further reiterated that a criteria-based policy would be easier for the local authority to manage, to which the interviewer agreed, as this policy approach would allow for more flexibility surrounding the unknown technological changes that could occur over the plan period.

Question Nine

“On the topic of setting targets and how we approach the technology mix, the LAEP advises the setting of specific targets for specific technologies. **What are your**

thoughts on setting an overall targets for renewable energy as opposed to setting individual targets for specific technologies? Should the targets be different for stand-alone developments such as singular turbines or ground/roof mounted solar?"

The respondent described the use of "milestones" rather than formal targets, reflecting some stakeholders' preference for less rigid terminology. These milestones covered a range of areas related to energy and decarbonisation, including renewable energy generation (e.g. wind and solar), building retrofit, heat pump deployment, and electric vehicle infrastructure.

They emphasised that such frameworks represent only one possible pathway to achieving net zero, noting that multiple alternative approaches exist. As a result, flexibility is important, and different combinations of measures could still deliver the same overall outcome.

While the framework provides a useful guide, the respondent suggested that, from a planning perspective, the overall level of energy generation may be more important than meeting specific technology-based metrics. Variations in how targets are achieved were not seen as problematic, if broader decarbonisation objectives are met.

The interviewer provided a follow-up comment referring to a previous interview, where a distinction between outputs and outcomes was discussed.

The respondent further commented that progress in this area is partly dependent on external funding, with future work likely to continue but not necessarily under the same funding arrangements.

They also highlighted that existing plans tend to emphasise particular technologies, such as heat pumps, but stressed that a wider range of heating solutions is available, including heat networks and emerging alternatives. As technologies evolve, they suggested it is important to remain open to newer options and adapt approaches accordingly.

Overall, they expressed no concern about taking a flexible approach, provided that different solutions are considered over time and align with broader objectives.

Question Ten

"Do you have any thoughts on how the LDP could facilitate perhaps not specifically heat network development, but the investigation of heat pump opportunities? Do you think this would be worthwhile?"

The respondent highlighted the potential value of integrating mine water heating opportunities into local development planning, particularly where emerging mapping identifies suitable locations. Including such opportunities in planning policy was seen as helpful in supporting future project feasibility and creating a more enabling planning environment.

They also noted that identified heat network opportunities are still at an early stage, with further assessment planned. While some locations may currently lack clear end users, this could change over time depending on future development patterns. As such, there is value in keeping options under review and identifying potential opportunities within planning frameworks.

Overall, the respondent emphasised that mine water heating and heat networks represent promising low-carbon heat sources, and that where these resources already exist, they should be considered as part of a strategic approach to energy planning.

Question 11

“Thinking about the potential for heat generation, there has been a case in Germany surrounding legislation that requires data centres that produce a certain annual amount of heat to connect to a heat network. **Do you think there are perhaps opportunities in Caerphilly for a similar system, and how this could be incorporated into the LDP?**”

The respondent identified a growing challenge related to the increasing number of data centres being developed in the region. They noted the absence of clear national policy requiring such facilities to consider the reuse of waste heat for local benefit. As a result, there is limited incentive for developers to pursue heat recovery, given that their primary focus is on core operations rather than wider energy integration.

The introduction of local planning policies was suggested as a potential way to address this gap and encourage more sustainable outcomes. However, the respondent was uncertain about the current presence of data centres in the immediate area.

The respondent further noted that data centre developments in the wider region tend to be concentrated in certain locations, although awareness of their full distribution is limited. They suggested that some facilities may operate with relatively low visibility.

They proposed that local planning policy could play a stronger role in requiring new developments—particularly those generating significant waste heat—to consider opportunities for heat recovery and integration into local heat networks.

Additionally, they noted that energy-intensive developments such as data centres can place considerable demand on electricity infrastructure. While such facilities are likely to secure grid connections, this can have wider implications for local capacity and availability for other users. As a result, incorporating on-site energy generation or efficiency measures was suggested as a potentially important consideration.

The interviewer provided a follow-up comment surrounding their hopes that data centres will not be situated within the borough, to help protect grid supply and capacity, water supply and power supply.

Question 12

“Touching on monitoring and reviewing, do you have any thoughts on the best way for us to keep track of energy generation within the borough? How do we review the targets or milestones that we set? Is there anything you can think of that could help us facilitate this?”

The respondent suggested that monitoring progress through existing planning processes, such as annual reporting within local development frameworks, could be beneficial. They emphasised the importance of selecting appropriate indicators and measures to track progress against established milestones.

Drawing on experience, they noted that while similar monitoring had been undertaken elsewhere, it may not have sufficiently addressed energy-related outcomes. They recommended strengthening the focus on energy within monitoring frameworks to better support delivery and evaluation of objectives.

One interviewer provided a follow-up comment surrounding the difficulty of monitoring the existing LDP, due to its adoption in 2010 and the fact that most of the data that we originally monitored no longer exists.

The respondent further commented around the availability of useful datasets to support energy planning and analysis. They pointed to scenario-based modelling data from national grid sources, which provide both future projections and baseline information on current energy conditions. These datasets were described as particularly valuable for understanding trends in electricity and renewable energy.

They also noted additional sources of relevant data, such as national statistical databases, which may complement grid-focused information. While some datasets are more electricity-oriented, they were considered helpful resources for informing evidence-based decision-making in energy planning.

Question 13

“Thinking about repowering, how do you think we could prepare for the potential repowering of older developments within the LDP? Are there any issues surrounding this that you are aware of?”

The respondent admitted that they do not have a clear answer to this question.

One interviewer provided a follow-up comment around that, from a planning perspective, it's difficult to accommodate repowering, due to older turbines being outdated, and new legislation requiring buffer zones to be larger, among other things.

Another interviewer outlined their views that repowering is such a problematic issue that it is not really viable, due to existing sites that older turbines are located on not being suitable for newer, larger turbines.

Following these comments, the respondent noted the importance of a flexible, site-specific approach to renewable energy planning. They noted that it may not always be

appropriate to require renewable technologies in every case, particularly where site conditions or constraints make them unsuitable.

While there may be value in prioritising renewable energy wherever possible, they stressed the need for practicality, recognising that alternative solutions may sometimes be necessary. Overall, they highlighted the importance of assessing each site on its merits and making realistic, context-sensitive decisions.

While alternative technologies may be available, it is important to adopt a practical approach when considering their application. Not all solutions will be suitable in every context, and flexibility is key in identifying appropriate options.

They also noted the potential value of emerging data sources to support planning and monitoring, referencing a forthcoming dataset intended to enhance energy planning capabilities. However, its availability is currently dependent on funding confirmation.

The respondent highlighted the potential use of a heat planning tool to support analysis of appropriate heating solutions across different areas. This tool focuses on assessing housing types and characteristics, grouping similar properties and assigning suitable heat technologies accordingly.

They noted that the approach is primarily geared towards domestic heat planning and is being piloted in one area, with the intention of evaluating its effectiveness before considering wider regional rollout. Overall, it was identified as a potentially valuable resource for informing future heat planning and strategy development.

Closing Statements

The respondent noted that they are happy to help with any future concerns surrounding renewable energy generation and the formulation of the replacement LDP.

Interview Three

Question One

“Our national planning policy sets out renewable energy targets for Wales, which local authorities are seeking to meet through the planning process. **Do you have any thoughts on how Caerphilly should balance the need to meet these targets with any local constraints?**”

The respondent expressed strong support for the development of mine water heat, emphasising its efficiency advantages over more widely promoted technologies such as air source heat pumps. Drawing on experience with local energy planning, they noted some frustration that consultancy approaches have tended to prioritise air source systems, despite the higher performance potential of mine water and ground source solutions.

They highlighted the use of “opportunity mapping” as a key tool to identify areas suitable for mine water heat deployment. These maps, developed across multiple regions, classify locations based on feasibility and help identify where viable heat resources coincide with significant demand. However, the participant noted that mine water heat is inherently geographically constrained, being dependent on the presence of former mine workings.

A key recommendation was to integrate these opportunity maps into the planning process as an additional evidence layer. This would allow decision-makers to consider mine water heat potential alongside other development factors (e.g. transport, location suitability), helping to guide site selection and support appropriate developments in areas where the resource and demand align.

Question Two

“So, regarding these opportunities then, we've had a discussion around whether we designate local search areas for other developments such as wind and solar, or whether we focus more on a criteria-based policy. But with mine water, it's a little bit more geographically determined in terms of where those mine workings are. You said that you'd like to see that in the plan in terms of what you have denoted as good and possible, so maybe there's potential for designating these specific areas. **Are local search areas something that you would recommend for inclusion in the plan?**”

The respondent clarified how opportunity mapping categorises areas for mine water heat potential, distinguishing between “good” and “possible” locations. Areas identified as “good” are considered strong candidates for development, while “possible” areas may still be viable, particularly where there are large nearby heat demands. In such cases, higher infrastructure costs (e.g. due to deeper mine workings and more expensive drilling) could be offset by substantial energy demand from uses such as hospitals, colleges, or major developments. Smaller-scale developments, however, may not be financially viable in these locations.

They explained that supplementary analysis has been undertaken to refine these broad opportunity maps by identifying priority areas where favourable conditions align with significant existing or planned development. These refined areas are suggested as key locations for early consideration within development plans.

The participant also emphasised the flexibility of the mapping approach. While priority areas can guide strategic planning, the broader dataset can still be applied on a case-by-case basis. They noted that individual development proposals can be quickly assessed against mine water heat potential, enabling an adaptive and responsive approach to integrating this technology into planning decisions.

Finally, they highlighted a willingness to support this process by providing site-specific assessments where needed, helping to embed consideration of mine water heat opportunities throughout the development planning process.

Question Three

“Thinking about development time within the plan period up to 2035, and what that potentially might look like, **do you think it’s realistic to set a target for mine water heating, or is it better to set out a general ambition that we would like to see?**”

The respondent recommended identifying one or two specific, deliverable projects within the plan period to help move from strategic ambition to practical implementation. Drawing on previous experience, they highlighted that mine water heat schemes can progress relatively quickly, noting an example where a project moved from initial feasibility to operation in approximately three years. They suggested that delivery timescales often depend more on organisational decision-making and risk appetite than on technical limitations.

They emphasised the value of selecting promising locations early, particularly those already identified as having strong potential, and progressing these through initial feasibility (Phase 1) assessments. Such studies can provide confidence in the technical viability of a scheme, particularly from a mining and resource perspective, and form a basis for further development.

The respondent also noted the importance of identifying suitable end users, such as large buildings with consistent heat demand (e.g. hospitals or similar facilities), to support scheme viability. Overall, they suggested that taking a proactive, project-focused approach—supported by early feasibility work and a willingness to accept some level of risk—could help accelerate delivery and demonstrate the potential of mine water heat within the area.

Question Four

“With some of the other developments that we look at, such as wind and solar, we generally look for an element of community ownership. **Does that exist within Mine Water? How does that operate? Is that something that you've seen happen? If so, how could we include that in the plan?**”

The respondent outlined a range of delivery and operational models for mine water heat schemes. One example highlighted a locally owned energy company established by a local authority, which initially operated a district heating network before integrating mine water heat. This model was described as effective, with strong local oversight supported by external technical expertise during design and construction.

Other examples included privately operated schemes, demonstrating that delivery can also be led by commercial organisations. However, the participant emphasised that all models require a clearly identified operator responsible for ongoing management, maintenance, and system performance. Unlike more conventional heating systems, mine water heat schemes involve continuous operational oversight and cannot be treated as passive infrastructure.

At present, operational responsibility typically sits with local authority-backed entities or private companies, and there is limited evidence of community-led operation at scale. The participant also highlighted the potential for integrating complementary technologies, such as on-site renewable generation (e.g. solar), to power heat systems and reduce carbon emissions further. In some cases, this integration enables near zero-carbon operation.

Overall, the discussion underscored the importance of establishing robust governance and delivery structures alongside technical feasibility when developing mine water heat schemes.

Question Five

“In terms of barriers to deployment, you’ve mentioned how these could be organisational, but in general, **what do you find as the key barriers to deployment?**”

The respondent identified drilling risk as a key concern in the development of mine water heat schemes, particularly from a funding perspective. While technical evidence suggests relatively high success rates—especially when appropriate expertise is applied—there remains a perception of uncertainty among funders, who may be hesitant to commit significant upfront investment to drilling activities.

They emphasised that the involvement of suitably experienced specialists is critical to mitigating these risks. Examples were cited where projects encountered difficulties due to a lack of specific mining or subsurface expertise, leading to unsuccessful drilling outcomes or misinterpretation of underground conditions. In contrast, where the correct technical skills are in place, the likelihood of success is significantly improved.

Once the initial drilling and testing stages are successfully completed, the participant noted that the system becomes comparatively low risk, functioning similarly to a conventional district heating network with a reliable energy source. They also highlighted the role of early-stage feasibility and assessment work in quantifying risk and building confidence among stakeholders, particularly through structured reporting that evaluates the viability of subsurface conditions.

Overall, the discussion underlined that perceived risk—rather than actual technical uncertainty—is often a major barrier, and that this can be addressed through expertise, evidence, and robust upfront assessment.

Question Six

“Do you see the constraints potentially varying, depending on whether it's going to be a new development coming on to the mine water heat network or if it was through the retrofit of existing buildings onto it?”

The respondent emphasised that, fundamentally, different low-carbon heat technologies (e.g. mine water, air source, or ground source) present similar challenges

once a reliable heat source is established. The primary issue lies not with the source itself, but with how well it integrates with existing building heating systems, particularly in retrofit scenarios. Older buildings designed for high-temperature systems may require upgrades—such as larger radiators or improved pipework—to maintain efficiency when using lower-temperature renewable heat.

New developments were identified as more straightforward, as systems can be designed from the outset to operate with low-temperature heat sources. However, a key barrier is the perceived risk among developers. While the technologies involved are well-established, there is often hesitation to adopt systems such as district heating, particularly where they are seen as potentially complicating or slowing down delivery.

The respondent noted that developer willingness to engage with low-carbon heat networks can vary significantly. Even where viable schemes exist, uptake may be uneven, with some developers opting in while others choose alternative solutions. This reflects broader commercial priorities, with developers typically focused on minimising risk and ensuring efficient delivery and sale of properties.

Overall, the discussion highlighted that the main challenges are not technical but relate to system integration, retrofit constraints, and market acceptance—particularly among housing developers.

Question Seven

“There are new regulations around heat networks. Do you see that as a barrier of any kind, or do you think that is something that needs to be in place? Do you think that will have negative impacts on planning?”

The respondent highlighted the importance of stronger policy mechanisms to encourage or require connection to district heating networks in new developments. They suggested that, without some form of mandate or firm encouragement, uptake is likely to remain limited, as developers may default to simpler and more familiar technologies such as air source heat pumps.

Examples were given of areas where this approach is already being implemented, including schemes where expanding heat networks are increasingly integrated into new developments, and international contexts where connection is legally required. These cases demonstrate how policy intervention can support the growth and viability of district heating systems.

However, the respondent noted that voluntary uptake is often constrained by developer preferences, particularly where alternative solutions are easier to install and involve less perceived risk. As such, policy support is seen as a key enabler of wider adoption.

The discussion also emphasised the role of cost in driving change. While environmental benefits are significant, the participant suggested that financial advantages are likely to be the most influential factor in encouraging uptake. They noted that heat network solutions, particularly mine water-based systems, can offer competitive or lower running costs compared to gas, alongside substantial emissions reductions.

Overall, the participant argued that a combination of policy measures, economic incentives, and clear cost benefits will be essential to scaling up district heating and low-carbon heat technologies.

Question Eight

“Aside from identifying specific projects that we think would be worthwhile in the plan, do you think there are any levers at our disposal potentially within the plan, that would help support further development or further uptake of mine water heat, and even district heat without mine water? Is there anything you would like to see within the LDP to support that?”

The respondent emphasised that energy provision—particularly heating and cooling—should be treated as a core consideration within development planning rather than a secondary factor. They argued that it should be integrated alongside other fundamental infrastructure priorities, such as transport and connectivity, throughout the plan-making process.

They highlighted that, unlike some infrastructure types which can be more flexibly located, certain energy resources (such as mine water heat) are geographically constrained. As a result, spatial planning should take account of these fixed opportunities. This could involve aligning future development—such as housing growth—with areas where there is strong potential for low-carbon heat sources.

The respondent suggested that opportunity mapping could support this approach by identifying areas where energy potential and development needs overlap. These areas could then be prioritised or given additional consideration in site selection. While current infrastructure constraints (e.g. transport links) may present challenges, they noted that these could change over time, and should not necessarily preclude long-term strategic alignment between development and energy opportunities.

Overall, the discussion highlighted the importance of embedding energy considerations at the heart of spatial planning to support more sustainable and integrated development outcomes.

Question Nine

“Do you envision the state of the market at the minute, regarding capacity and skills, being prohibitive to the deployment of more developments and getting things off the ground within the next ten years?”

The respondent identified potential capacity constraints in the specialist skills required to deliver mine water heat schemes. They noted that there is a relatively small pool of professionals with relevant mining and subsurface expertise, particularly those with specific experience in coal mining environments. This limits the number of organisations able to undertake accurate assessments and design work.

Similarly, while many drilling contractors operate in the wider market, only a small number have the technical capability to reliably drill into mine workings at depth. This creates a further bottleneck in delivery capacity.

The respondent also discussed the potential for skills transfer from related industries, such as oil and gas, but expressed some scepticism about the extent to which these skills are directly transferable without additional training. While such transitions may help expand capacity over time, there may still be a need for targeted reskilling to meet the specific technical demands of mine water heat projects.

Overall, they suggested that if deployment of this technology were to scale up significantly, specialist skills and workforce capacity could become a key constraint.

Question Ten

“Thinking about monitoring and reviewing, does your organisation have any plans in terms of what you’re looking to do in the future regarding monitoring opportunities and refreshing these data sets, and how we could potentially incorporate some of these techniques ourselves?”

The respondent highlighted recent advancements in data accessibility and research relating to mine water heat. They noted the introduction of enhanced digital mapping tools, allowing users to not only view basic spatial data (such as mine workings and shafts), but also access detailed historical mine plans through an interactive platform. This provides significantly improved insight into subsurface conditions, supporting more informed feasibility assessment and planning.

Ongoing research and development was also emphasised, particularly in relation to understanding underground heat behaviour. Monitoring projects are being used to assess how heat moves through mine workings and how multiple schemes in close proximity may interact. This work is intended to ensure that resources are used sustainably and that individual schemes do not negatively impact one another.

The respondent further highlighted emerging innovation in the use of mine workings for heat storage, including trials involving the injection and retention of heat underground. This presents potential opportunities to capture and store surplus heat from other sources (e.g. industrial processes), improving overall system efficiency.

In addition to research, the organisation continues to support project development through opportunity mapping, site-specific feasibility studies, and technical assistance with procurement and delivery. They also noted increasing interest in utilising mine

water discharge points as a heat source, although site-specific constraints can affect feasibility.

Overall, the discussion demonstrated a rapidly evolving evidence base and growing technical capability, alongside continued support for practical deployment and innovation in mine water heat systems.

Question 11

“Do you ever have issues with getting new connections? I assume it depends on the size of the scheme and the related energy requirements, but is this something that could be a barrier? Have you experienced anything around this?”

The respondent explained that grid connection issues are not typically handled by their organisation, but by local authorities or external advisors, and so far, this has not posed a major barrier. However, they noted that it could become a challenge in cases involving large heat demands (e.g. hospitals), where increased electricity requirements from heat pumps may be significant.

Drawing on past experience in energy generation projects, they highlighted that securing grid connections—especially for smaller, embedded generation schemes—has historically been difficult. Limited capacity and speculative holding of connections by third parties could delay or even prevent project delivery.

They emphasised that grid capacity should be assessed early in project feasibility studies. While their organisation does not undertake this work directly, it is typically covered within techno-economic assessments conducted by others. Overall, available grid capacity was described as a fundamental issue that can be complex and time-consuming to resolve.

Question 12

“Touching on the storage of heat, have you been looking at any form of carbon capture and storage underground or within mine workings, or is that more of an offshore renewable energy storage method?”

The interviewee noted that the idea of using mine workings for CO₂ storage had been considered in the past but was largely dismissed due to safety concerns. The extensive and interconnected nature of mine networks—often linking across large distances and reaching the surface—was seen as posing a significant risk of leakage, particularly if pressurised CO₂ were to migrate unpredictably.

In contrast, their current focus is on heat-related applications. This work emphasises understanding the structure and connectivity of mine workings, as this affects heat retention. More isolated systems are considered favourable, as widely connected networks may lead to heat dissipating over large areas. Ongoing research and development is focused on assessing these characteristics.

Question 13

“Touching on something that was discussed earlier around minewater heat opportunity mapping, if we looked at opportunities for sites, **is there a proximity around these sites where it becomes prohibitive? For example, if you have a site within 100 metres of a heat network, is there a distance where connection no longer becomes possible?**”

The respondent highlighted that the feasibility of heat distribution is largely influenced by project scale and the economics of pipeline infrastructure. While some practitioners advocate for high-temperature district heating networks transporting heat over several miles, this approach can lead to significant thermal losses and increased costs due to the need for heavily insulated pipework.

They suggested that such long-distance, high-temperature distribution is generally unsuitable for mine water heat systems, except over short distances. Instead, they pointed to an alternative “ambient temperature” approach, where heat is transferred from mine water via a heat exchanger and distributed at relatively low temperatures (e.g. 15–20°C). This reduces heat loss due to the smaller temperature difference between the pipe contents and surrounding ground, allowing for simpler and more cost-effective pipe materials.

Overall, lower-temperature distribution systems were described as more efficient and economically viable for mine water heat, particularly when the heat upgrade (via heat pumps) is located close to the point of use.

Closing Statements

The respondent described a proactive, early-stage screening approach to project enquiries. Potential stakeholders are encouraged to submit initial site details for a rapid preliminary assessment, which can be completed quickly and at no cost. This process is intended to identify any major constraints before committing to more detailed and costly feasibility studies.

They emphasised the importance of avoiding unnecessary expenditure, particularly in public sector contexts, by being transparent about project viability from the outset. If a project is unlikely to succeed, this is communicated early; where there is potential, stakeholders can proceed to the next stage with greater confidence. This approach reflects a broader commitment to providing honest and responsible guidance in early project development.

The respondent stated that they are open to participating in further discussions surrounding minewater opportunities and limitations. The respondent also provided comments around air source heat pumps, and how they can be limited in effectiveness in winter months, however there are improvements underway to help mitigate this.

Interview Four

Question One

“National planning policy sets out some renewable energy targets for Wales, which local authorities are seeking to meet through the planning process. **What are your thoughts on how Caerphilly should balance the need to meet those targets with our local constraints?**”

The respondent notes that the organisation has worked closely with several local authorities over recent years to explore how renewable energy and storage could be integrated into existing networks. This work has shown that decisions about the size, capacity, and location of generation assets are highly site-specific, with no single constraint applying across all areas. As a result, early engagement has been encouraged so network constraints and available capacity can be understood from the outset, allowing less constrained locations to be identified. Ultimately, the ability to provide support depends on the specific location and network headroom available, making it difficult to give definitive guidance without knowing the exact requirements in advance.

Question Two

“What level of ambition do you think could be realistic when setting the targets that we need to within the LDP for renewables across the technology mix and how ambitious should we be whilst also remaining realistic?”

The respondent highlighted that renewable energy targets are intended to reflect all generation expected to come forward within the plan period, including both distribution and transmission-connected schemes. For large-scale generation, delivery timescales are heavily influenced by external system reforms and existing connection queues, meaning capacity is largely fixed by what is already committed. In many areas, technologies such as solar and battery storage are currently oversubscribed, making it unlikely that new large schemes will connect unless existing projects drop out. As a result, it was suggested that ambitions for large-scale generation should align closely with the most up-to-date information from system and connections reform processes, as this provides the most realistic and financially committed picture. Greater flexibility is likely to exist at smaller scales, particularly through rooftop solar on existing buildings and new developments, where cumulative impacts could be significant even though individual installations are modest. This small-scale generation was identified as an area where local planning policy may have more scope to influence outcomes.

Question Three

“Within renewable energy generation in Wales, there's targets around community ownership and local ownership, so we were looking to gather your thoughts on that and how the LDP could reflect that, potentially with perhaps a fixed target or national

planning policy expectations. **Thinking about smaller scale developments where there might be more probability of them being able to connect to the grid and that balance between local ownership, do you have any thoughts on how we could potentially achieve that through the LDP?”**

The respondent stated that, from a network perspective, connections are facilitated for all customers, regardless of whether schemes are privately or community owned. Recent rule changes have increased the capacity threshold for certain generation projects that can connect without upstream assessment, making it easier for a wider range of small to medium-scale schemes to come forward than in the past. In this context, it was suggested that targets could potentially be achieved through a greater number of smaller, more distributed generation sites rather than a small number of large schemes, as these may be easier to accommodate within the energy system. Consideration was encouraged around how assumptions are made for community energy projects, including their likely size, distribution, and ownership models, as these factors could influence deliverability.

Question Four

“Do you see any impacts or fluctuations in terms of the ability to connect based off more historical developments coming offline? We had an interesting discussion yesterday about re-powering versus putting in a new installation. I appreciate that might not happen within the time frame we're talking about, but there could be a possibility of some developments coming offline. Do you foresee that? What impacts do you do you foresee with that?”

Respondent one outlined that repowering is an increasingly relevant issue, given that much of the generation connected to the network over the past 20–25 years is approaching the end of its operational life. Advances in technology mean that modern turbines and equipment are significantly more efficient, raising questions about how much additional capacity developers might seek when repowering existing sites. A key consideration is the balance between increasing generation capacity and the limitations of existing network connections, which were often designed close to the original installed capacity. While repowering can be attractive due to established sites and infrastructure, significant increases in capacity may require network reinforcement, potentially increasing costs and complexity.

Respondent two noted that newer wind technologies can deliver substantially higher output from the same physical footprint. The focus of recent analysis has been on whether repowering at already large sites could push them beyond distribution-level thresholds and require connection at transmission level instead. Such scenarios would primarily apply to larger existing wind sites becoming significantly larger through repowering, rather than smaller schemes, and could have implications for future energy system planning assumptions.

Question Five

“Thinking about sites that might be available for development, as part of the REAs and even within the LEAP, spatial plans were drawn up of potential areas that we might be looking at for wind, solar, and potentially other renewables. **What are your views on local search areas within the LDP or an alternative option such as a criteria-based policy? Do you have any views on the best way to portray that within the plan?”**

The respondent suggested that energy planning should be grounded in an assessment of local resource availability to ensure ambitions are realistic and proportionate to local conditions. Areas with stronger renewable resources should reflect this potential, while recognising that other locations may have more limited opportunities. However, this resource-led approach should also be aligned with what is already committed through existing projects and the current connections pipeline, particularly for larger schemes. Linking spatial resource assessments with what is already under construction or coming forward was highlighted as important for ensuring plans reflect both theoretical potential and practical deliverability.

Question Six

“What are some of the other constraints or barriers are you seeing generally across Caerphilly and the region for renewable deployment?”

Respondent one noted that there has been a significant increase in small-scale solar and battery installations in recent years, while new wind development is currently more constrained due to the volume of projects already in the pipeline. In some areas, limits in low and high-voltage network capacity mean that reinforcement is required even to accommodate standard domestic-scale connections. Despite these constraints, small installations continue to come forward incrementally and are not always subject to prior control or coordination. Recent changes to assessment thresholds have enabled more medium-scale projects to progress, leading developers to engage earlier with the network to understand reinforcement requirements, delivery timescales, and costs. This earlier engagement helps ensure network constraints are reflected in project planning and decarbonisation modelling.

Respondent two noted that a dedicated network operations team is proactively assessing future demand and generation impacts on the low-voltage network, informed by forward-looking energy scenario forecasts. This work aims to identify and address potential reinforcement needs in advance, reducing the risk of low-voltage constraints becoming a barrier to deployment. While reinforcement for domestic connections is often undertaken reactively, efforts are now being made to anticipate requirements earlier, mirroring the strategic planning already undertaken at higher voltage levels.

Question Seven

“Is there something that should be in the LDP around grid balancing? Other technologies, for example hydrogen, might be able to support with grid balancing as well. Is there something that should be in there around that?”

Respondent one outlined that they haven’t yet come across this and will look to contact the interviewer surrounding this subject.

Respondent two asks one of the interviewers a follow-up question relating to how future network constraints are forecast, many of which depend on the uptake of flexible technologies such as EV chargers, rooftop solar, domestic batteries and heat pumps. These assets can respond to price signals and operate flexibly. If network operators have visibility of these assets when they connect, and if customers register them as flexible, they can be called on at different times to manage local network constraints through flexibility payments. This is not national grid balancing, but local constraint management. For this approach to work, there needs to be confidence that customers will register their flexible assets when they connect. **The open question is whether planning policy could play a role by recommending or requiring new developments that install technologies like EV charging or solar also notify the network operator.** This could improve visibility of flexible assets and help manage the local network more efficiently.

The interviewer diverts the question to another interviewer, who states that from a policy starting point, the adopted development plan is relatively old and contains very limited reference to renewable energy, with no specific policies. As a result, the new plan is being developed from a different baseline, with a more proactive approach to covering renewable and low-carbon technologies. Information on installed technologies is currently gathered after completion, largely through building control processes. In principle, a monitoring framework within the development plan could allow this information to be shared with network operators once obtained. However, from a planning policy perspective, it would be difficult to require registration of such technologies through policy. The emphasis needs to remain on encouraging renewable energy and low-carbon development, while keeping policies flexible and non-prohibitive to allow for future or unforeseen technologies. Improving visibility is therefore more likely to be achieved through stronger information-sharing arrangements with building control and other bodies, rather than through direct planning policy requirements.

Respondent two agreed that this is an area worth exploring further, as the network operator is currently only notified of around half of new EV charge points and heat pumps connecting to the network, which makes effective network planning difficult. While enforcement would not be appropriate, there may be value in encouraging customers to register flexible assets when they connect. Policy wording could recommend registration and participation in flexibility markets, setting out the associated benefits, which could be developed collaboratively.

Respondent three provided a follow-up comment highlighting the ambition to operate a smarter, more flexible local energy system. An upcoming session has been arranged where a specialist will explain how local authorities could benefit from participating in flexibility arrangements and what opportunities this could unlock. Greater visibility of assets connecting to the network was emphasised as critical to managing and alleviating local constraints more effectively. Improved coordination enables better network operation while also providing financial incentives for customers using flexible assets, creating mutual benefits for both network operators and local authorities.

Question Eight

“I know the D-phase has projections on what this could look like, but **what are your thoughts on the mix of technologies that we'd need to see across Caerphilly over the next 10 years, and how do we safeguard against the potential other technologies that we're maybe not yet aware of?**”

Respondent one asks whether the interviewer is looking at heat pumps as a renewable energy source, to which the interviewer confirms, alongside other technologies such as rooftop solar, wind turbines and solar farms.

The respondent notes that, at a local level, most opportunities relate to domestic technologies such as heat pumps, battery storage and rooftop solar. Larger-scale connections, particularly those involving battery storage, can be more challenging for the network. In one example, several megawatts of capacity were proposed across multiple sites, but the issue was that these assets would operate simultaneously, creating network constraints. The preferred solution was to pursue timed or flexible connections, allowing assets to import electricity during low-demand periods and export during peak demand to support the network. However, uptake of these flexibility arrangements has been very limited, with only a small number progressing to construction. Overall, smaller-scale connections on low-voltage networks are seen as easier to accommodate than larger high-voltage connections.

Question Nine

“Thinking about those smaller connections then, such as rooftop solar and heat pumps, we're obviously keen to set some targets. **What are your thoughts on how we go about that and is it something that we align to new development only? Do we include retrofit? Have you got any thoughts on how we can go about setting those targets and what we should be including?**”

The respondent notes that assumptions used in heat-pump uptake modelling generally suggest that conversion begins with off-gas properties, where electrification is becoming increasingly cost-effective, supported by government incentives. This is followed by new-build homes, particularly once future standards require developments from the late 2020s onward to move away from gas. From a network perspective, it is important to understand whether heat demand appears as multiple individual electric heat pumps or as a smaller number of communal systems, as this affects how load

presents on the network. These two customer types - off-gas homes and new builds - are therefore the primary focus of near-term forecasts. Retrofit of existing privately owned properties is expected to occur later, likely from the mid-2030s onward. Where housing stock is publicly owned, there is greater visibility and control over retrofit programmes, making forecasting more certain. A useful additional indicator for modelling private retrofit uptake is the average age of existing heating systems, as replacement typically occurs only when systems fail rather than proactively. Combining data on fuel type, new development, publicly owned buildings and boiler age can help provide a more informed and phased view of future heat-pump adoption.

Question Ten

“Do you have any thoughts on how we can monitor and review the LDP? I mean, we have existing channels, where we share information with each other, but **do you have any thoughts on how that could be strengthened or anything that you would like to see from us in terms of monitoring and review of the LDP and our targets that we're setting through it?**”

The respondent notes that the network operator routinely supplements its internal data with external sources to address gaps in visibility, drawing on datasets such as vehicle registration information and certification scheme data for technologies like EVs, heat pumps and rooftop solar. This information feeds into strategic energy planning outputs, which are then shared with local authorities. A key limitation is the relatively slow update frequency of these datasets, which are often published annually or quarterly and can lag real-world deployment by many months. This reduces their usefulness for tracking rapidly changing connection patterns. More timely data on development build-out rates, including new domestic and non-domestic properties, would therefore be particularly valuable. Existing housing monitoring and annual reporting could support this if shared on an ongoing basis. Similarly, there may be scope for the network operator to share additional information, not only on confirmed connections but also on connection enquiries and applications, noting that many proposals do not ultimately proceed. Improved two-way data sharing could help both parties plan more effectively, and further opportunities for collaboration were welcomed.

Question 11

“So we have mentioned a couple of times around upgrades and improvements to the infrastructure and how flexibility can provide support in the absence of the ability build that out in the interim, but **is there anything that you think that the LDP could do to facilitate, support, and improve your ability to upgrade the grid and upgrade the infrastructure to facilitate a wider deployment of renewables?**”

Respondent one notes that, as part of long-term network planning for the next regulatory period and beyond, analysis extending out to 2050 is highlighting a growing structural challenge within the electricity network. Substations and transformers are

built to standard sizes with physical and technical limits, meaning capacity cannot be increased indefinitely. Once those limits are reached, network reinforcement requires the provision of entirely new substations rather than incremental upgrades. Forward analysis indicates that the proportion of network constraints requiring new substations as the solution is likely to increase significantly over the next decade. This means that identifying and securing suitable sites will become increasingly important to enable effective load sharing and to make best use of existing assets. There may therefore be value in development planning policy recognising the future need for new electricity infrastructure.

Respondent one also notes that indicative, forward-looking information on areas where new substations may be required - ranging from small installations with minimal footprint to larger primary substations - could help inform land use planning. Historically, difficulties have arisen where development progresses without early consideration of electricity infrastructure, resulting in late requests for large amounts of capacity and limited options for substation siting. Earlier integration of network considerations could enable more efficient locations, reduce costs and minimise the need for extensive cabling. Overall, the analysis suggests an increasing need to plan proactively for new substations, and that acknowledging this requirement within the development plan could support more efficient and resilient future electricity networks.

An interviewer responded, noting that where there is a clearly identified need for larger infrastructure sites, land can be allocated within the development plan. However, this approach is less practical for smaller-scale infrastructure, such as minor installations with very small footprints. There was openness to continuing the discussion outside the meeting to explore this issue further, including engagement with strategic planning colleagues as the plan-making progresses.

Respondent two stated that increasing challenges are being experienced in densely populated areas where electricity generation is oversubscribed and there is limited land available to install additional distribution transformers. Even relatively small installations require a defined footprint, and alternatives such as pole-mounted equipment are often not viable or safe in urban environments. Existing substations are already operating at their maximum voltage settings, leaving little or no remaining operational flexibility due to rising levels of distributed generation. While new technologies and enhanced monitoring may provide better real-time visibility in future, land availability remains a key constraint.

Respondent two further states that the primary issue is therefore not reinforcing the network itself, but finding suitable, safe locations for additional transformers that are needed to manage local constraints. This challenge is likely to become more apparent in residential areas as electrification and local generation increase. Because voltage and cable length limitations require substations to be located closer to points of demand and generation than in the past, small parcels of appropriately located land are increasingly necessary. However, safety considerations - such as separation from

homes and appropriate earthing - mean that not all sites are suitable. Addressing these issues will require closer collaboration with local authorities to help identify suitable locations, recognising that proactive planning for small-scale electricity infrastructure will become increasingly important as networks continue to evolve.

Respondent three observed that a clear theme emerging from the discussion is the need for closer collaboration and coordination between the local authority and the network operator. Differences in funding cycles and delivery timescales can make this challenging without early engagement. One suggestion was to hold a regular meeting at the start of each funding year to share a forward-looking 12-month programme of planned activity. This would give the network operator earlier visibility of likely developments and interventions, rather than only becoming aware once formal connection applications are submitted. Earlier strategic insight could help identify quick wins and potential constraints in advance, benefiting both parties. Establishing a routine, forward-planning discussion - sometimes described as a “connection surgery” - could support more efficient network planning and smoother delivery of local authority projects.

Respondent two further agreed that the discussion had been valuable. Similar engagement has taken place successfully with other local authorities, and these sessions provide useful insight into different parts of the organisation that may not otherwise be visible. Bringing together teams responsible for delivery with those analysing data and planning-ahead helps build a clearer shared understanding of network impacts. Overall, continued regular engagement was seen as both beneficial and refreshing, and worth maintaining going forward.

Question 12

“From our perspective, we've had a lot of DNS applications which have come in over the last couple of years, which are quite big developments and are going to take a couple of years, I would imagine, to get connected. **We can predict when the planning application is going to come in and rough timescales when they'll be delivered, but do you keep any data on forecasting when those big developments, for example, may be connected into the grid?** From our point of view, it might be helpful to see when that might be so that we can factor them into whether we're being too ambitious with a target, up to 2035.”

The respondent identified that several larger renewable energy generation schemes, including wind and solar projects, are currently subject to constrained or deferred connection dates extending into the late 2030s due to network capacity limitations. These schemes are typically above 5 MW, with some closer to 10 MW, and sit within a heavily oversubscribed generation pipeline. While there is relief when schemes withdraw from the connection queue, full build-out of all proposed projects in the near

term would pose significant challenges for the network. Smaller schemes - around 5 MW or below - are generally more achievable and may avoid lengthy connection delays. In some cases, staged or ramped connections could allow projects to connect initially at lower capacity, with export increased over time as network reinforcement is delivered.

The respondent further outlined that connection feasibility is highly location-specific and dependent on wider network constraints, including capacity at higher voltage levels. Close coordination with network planning teams is required to understand downstream impacts and potential delays arising from primary or transmission-level constraints. Early visibility of development intentions - including the scale, number and geographic distribution of proposed connections - can significantly improve outcomes. Understanding whether proposals are dispersed or concentrated, and whether they involve a few large schemes or multiple smaller ones, allows network operators to provide more timely guidance and help steer projects toward areas with greater capacity availability.

One interviewer noted that the local authority are working towards the confirmation of candidate sites and suggested that another meeting with the respondents would be useful for both parties, to outline where the potential renewable energy candidate sites could be.

Question 13

“What are your thoughts on how off-grid generation could play a part in a bigger picture, such as the use of private wires or a small-scale wind farm attached to an industrial site that's using it. **Do you have any thoughts on off-grid installations, and how that could be approached within the LDP, or if there is an approach that you think is reasonable within the LDP?**”

Respondent one provided insight into individual sites that have temporarily disconnected from the public network and instead been supplied via private arrangements with neighbouring “donor” sites, operating without interconnection or parallel running. These arrangements were progressed through detailed technical strategies to ensure demand could be met safely and reliably. The viability of such off-grid or private wire solutions depends on factors such as the ability to physically connect sites, resilience in the event of generation loss, and how customer demand would be managed without reliance on the wider network. While these approaches are not universally applicable, they are recognised as credible options worth exploring. Novel or unconventional proposals are welcomed and assessed through engagement with relevant technical and policy teams. As the energy system evolves, new delivery models and solutions will increasingly be required. Progress will rely on open collaboration, with stakeholders bringing forward ideas that can be refined and developed into workable alternatives. Continued partnership was identified as key to removing barriers and enabling innovation in future energy infrastructure.

Respondent two outlined that an industry event, held previously, explored alternative connection models, resulting in guidance on how distribution network operators can support businesses, including SMEs and industrial users, while they await wider network reinforcement. These approaches focus largely on “behind-the-meter” solutions. Practical examples were highlighted where organisations have combined on-site generation, such as wind, with battery storage to reduce reliance on the wider network. These models demonstrate how innovative local energy solutions can support growth despite network constraints. While such approaches can be effective, it was emphasised that maintaining some level of grid connection is generally beneficial. This ensures network operators retain visibility of connected assets and can plan for future demand and integration as the system evolves.

Respondent two further noted that maintaining some future export capability can be advantageous, allowing sites to reconnect or increase interaction with the wider network once reinforcement works are completed, rather than becoming fully isolated. At a distribution level, a range of measures are being explored to support customers in securing connections while longer-term upgrades are underway. Sharing practical case studies from different areas was highlighted as particularly valuable in demonstrating what is achievable and in supporting wider adoption of innovative connection approaches.

Respondent one outlined that the local authority is one of the customers they are working with now for potentially breaking away from the grid. The authority will still be connected to the grid but are looking to get their power from a nearby quarry.

Question 14

“In terms of sites where large energy users are potentially looking at going, having assets behind the meter, are you reviewing their capacity, in terms of what their maximum demand is and working with them to reduce that, to help free up capacity for others? Is that part of the strategic work that you are doing?”

The respondent outlined that, in arrangements where customers are supplied via behind-the-meter or private connections, resilience remains dependent on the public network. In the event of a failure between the primary source and secondary supply, customers must be able to revert to the distribution network and retain their demand reservation. This creates operational complexity, as the original supplier may also need to temporarily increase import capacity to cover the loss of generation. At present, transfers back to the public network require manual intervention, as there is no approved automated system to coordinate customer and network switching safely. For safety reasons, re-energisation involves on-site attendance to verify isolation, securely lock customer equipment, and prevent any risk of back-feeding, unintended parallel operation, or faults across multiple network sources. These constraints highlight the technical and procedural challenges of operating hybrid on-grid and off-grid configurations under current systems.

Closing Statements

Respondent one stated that the questions asked during the interview were comprehensive and reiterates that close collaboration and coordination between the local authority and interviewed party going forward is key to succeeding in terms of grid connectivity goals for the local authority area. The respondent outlined that potential land availability is crucial from their perspective, in terms of planning substations etc.

Respondent two outlined that they are happy to work closely with the local authority to look at potential sites, however stated that viability is a sensitive topic, and that any work they can help the local authority with, in this regard, is purely on a feasibility basis. Grid connectivity and capacity is a volatile subject matter and can change at any given moment, due to competing parties seeking grid connectivity. Respondent two advised the local authority to keep this in mind when thinking about potential sites and grid connectivity, as it is a fast and furious moving picture, due to the network's natural dynamism.

Interview Five

Question One

“So, we have national planning policy, which sets out some targets for Wales, which we're seeking to meet through local planning processes. **Do you have any thoughts on how Caerphilly Council need to balance the need to meet those targets with any local constraints that we may have?**”

The respondent noted that no one involved underestimates the complexity of the process. They pointed to a recent local example where a proposal was refused, highlighting the significance of local constraints from a planning perspective. From an industry viewpoint, they expressed frustration that despite supportive policies at both national and local levels, these are not always reflected consistently in decision-making. While acknowledging that policies are typically subject to local and project-specific criteria and cannot override all considerations, they emphasised the difficulty this creates for understanding where investment is most viable. They highlighted a perceived mismatch between national policy intentions and local implementation, which can make long-term planning and confidence in outcomes challenging, as more action is typically needed at a local level.

Question Two

“Given what you said, from your experience and your knowledge of the area, **what level of ambition do you think is realistic for Caerphilly and how should we approach these targets at a local level?** The replacement LDP goes up to 2035, and we have line constraints, grid constraints, social constraints etc. **What level of ambition do you think would be realistic for us?**”

Respondent one explained that, from the perspective of a large-scale onshore wind developer, there is now very limited remaining capacity within the local authority area. Past and recent high-level assessments indicate that the most technically suitable locations lie in the northern areas, though these are significantly constrained by landscape designations, which have previously led to refusals. As a result, prospects for new large-scale onshore wind development locally are considered highly unlikely, despite any stated ambition.

They suggested that future focus may need to shift toward other technologies or smaller-scale solutions, such as individual turbines or community-scale schemes, although these present their own challenges. While community energy projects are strongly encouraged in policy, the interviewee noted that they are often difficult to deliver in practice due to the high levels of funding, expertise, and stakeholder coordination required.

Respondent one acknowledged that larger commercial developers can be perceived negatively in comparison to community-led initiatives, but emphasised that they bring significant advantages, including financial resources, technical expertise, and the capacity to drive projects through to completion. Finally, they observed that smaller turbines are likely subject to less demanding technical and spatial requirements than large-scale schemes, for example in relation to height and separation distances from buildings.

Respondent two reflected on the spatial dimension of large-scale onshore wind development, noting that such schemes are likely to emerge in a limited number of concentrated locations rather than being distributed evenly across a local authority area. They suggested this pattern is largely driven by spatial constraints, meaning that only small pockets are likely to be viable and attractive to developers. As a result, decision-makers may need to anticipate and manage concentrated development rather than expect equitable geographic spread. The interviewee highlighted the importance of considering issues such as balance and cumulative impact, while acknowledging that, in practice, spatial constraints may effectively determine whether capacity is concentrated in specific areas rather than dispersed more widely.

Question Three

“I know that your interest is the larger scale developments, but I'd just be interested in your thoughts around community ownership and **whether we should include a fixed target for community or local ownership within the plan or just rely more generally on planning policy expectations?**”

The respondent discussed expectations around community or shared ownership within planning policy, noting that the concept can be interpreted in different ways. They explained that their organisation has taken varied approaches across different projects, including working through local authorities or partnering directly with community organisations. They suggested that it is currently difficult to set specific

targets or percentages for shared ownership, as different models are still being tested and it remains unclear which approaches are most effective in practice.

Drawing on experience, the interviewee noted that attempts to establish formal share-offer schemes proved complex and difficult to deliver, and that community organisations may be better placed to manage such arrangements due to their familiarity with these processes. They expressed concern that fixed numerical requirements for shared ownership could act as an additional constraint for large-scale developers, potentially limiting flexibility across different projects and, in some cases, affecting overall project viability.

The interviewee also highlighted challenges where shared ownership has been promoted but local authorities lacked the capacity or interest to progress it. They warned that placing too much emphasis on quantified shared ownership targets could risk undermining wider strategic objectives, such as carbon reduction goals. Instead, they advocated for a more flexible approach that allows for variation and innovation in how community benefit, community ownership, and shared ownership are delivered, suggesting this may result in more practical and holistic outcomes.

Question Four

“Relating back to something you said previously surrounding pocket scenarios, as part of the REA, they identified priority pre-assessed areas. **Within the plan, what is your view on the designation of local search areas? Or should we focus on a criteria-based policy as an alternative?**”

The respondent first asks for clarification on what the interviewer means by ‘local search area’, to which the interviewer provides clarification.

The respondent notes that having designated areas is a useful starting point, particularly for focusing effort and guiding initial site selection. However, care should be taken to ensure this approach does not undermine proposals outside those areas. Developments beyond designated zones can still be strong and viable and should not be dismissed purely on location. Overall, strategic areas are helpful, but they should not become the only focus. It is important to maintain flexibility and avoid a “one-stop shop” mindset. Additionally, robust research is essential when identifying strategic search areas. There are cases where designated areas may prove unsuitable, which can create challenges later in the process.

The interviewer provides a follow-up question surrounding the aspect of community involvement, and how, in this case, it’s about how the business case stacks up including community workers in it as well. The interviewer asks for clarification if this is right.

The respondent notes that delivering large-scale projects involves balancing many factors, and this complexity is often underestimated. Project viability can vary significantly depending on elements such as wind resource, grid connection costs, and

overall scale. For example, grid connection expenses can range widely, and this can determine whether a project is feasible. Rigid requirements can risk undermining projects, as small changes may be critical for some while negligible for others. Flexibility is therefore essential, both in project design and throughout the planning process, as there is no one-size-fits-all approach.

The participant also noted the value of community engagement mechanisms, such as shared ownership and community benefit funds, emphasising the importance of remaining adaptable to local needs. Internally, attempts to standardise the development process are challenging because every project faces unique constraints. Overall, variability between projects makes it difficult to apply fixed expectations, as financial performance and sensitivity to additional costs can differ greatly.

Question Five

“Weve touched on a couple of barriers that you’d be experiencing around large-scale developments. **Would it be fair to say that the largest barrier for large-scale developments within Caerphilly is identifying available area that is suitable? Is that the key barrier? What else are you experiencing?**”

The respondent stated that, at present, there are several barriers affecting development interest in the area, with land availability identified as the most significant. Suitable, unconstrained land is increasingly scarce across the UK, particularly in Wales and England, as sites are either already developed, in progress, or subject to constraints. Other key challenges include grid capacity and transport infrastructure. Grid access is a major constraint nationally, though conditions vary by region. Transport is also an issue, as turbine and component sizes are increasing while road and port infrastructure has not kept pace, particularly in rural areas. Together, these factors make identifying viable sites highly challenging.

At a strategic level, the area was noted to have relative advantages in transport connectivity and grid infrastructure compared to other parts of the UK, though local access constraints may still arise. Proximity to existing grid infrastructure can significantly enhance site viability, with particularly strong connections described as rare and highly valuable. The participant also highlighted the importance of planning authority performance. Positive experiences were noted where authorities demonstrated responsiveness and a willingness to progress applications toward a clear decision. This proactive approach was contrasted with more prolonged and uncertain processes experienced elsewhere.

Question Six

“Do you have any thoughts on what would be best for the plan, in terms of its approach to agricultural land? The best, most suitable agricultural land in relation to wind development and the potential impacts that we have surrounding this.”

The respondent notes that for onshore wind, land is relatively limited, especially when compared to other technologies such as solar. However, wind farms typically do not remove land from agricultural use, and farming activities can often continue largely unaffected. As a result, the impact of onshore wind development on agricultural land use is generally considered minimal or negligible.

Question Seven

“Do you have any thoughts, as a wind developer, on how we could approach more widely in the plan, the use of agricultural land in relation to renewable developments?” Understandably, due to your specialisation in wind and the lack of impacts this has on agricultural land, it might be a difficult question.”

The respondent stated that balancing agricultural land use with renewable energy goals is an important consideration. Emerging approaches, such as agrivoltaics, offer potential to combine energy generation with continued agricultural activity, providing a more balanced outcome. There may also be a case for considering land and soil quality when making decisions about land use change. Lower-quality or less productive land could be prioritised, and in some cases, temporarily removing land from intensive agricultural use may even improve soil condition over time. From this perspective, onshore wind presents an advantage, as it generally allows agricultural use to continue alongside energy generation, supporting a more compatible and integrated land use approach.

Question Eight

“Again, this may be a difficult question due to your expertise in wind energy, but do you have any thoughts on the right balance across the borough between wind and other renewables? Do you have any thoughts generally on how we could reflect this in policy to make sure that we’ve got the right level of flexibility, in terms of what we’re aiming to achieve?”

The respondent identified that a key consideration is to avoid overly restrictive approaches and instead maximise opportunities by maintaining flexibility. Not all proposals will be successful, but enabling a broad range of options increases the likelihood of positive outcomes. Given the pace of change in renewable technologies and the long-term nature of planning frameworks, policies should remain adaptable and forward-looking. Being overly prescriptive may limit the ability to accommodate emerging technologies and evolving requirements.

The respondent emphasised the importance of ambition, suggesting that starting with a more open and enabling approach is likely to yield better results. Local authorities were encouraged to position themselves as proactive facilitators of development rather than barriers. Finally, allowing space for innovation - particularly from smaller or emerging organisations - was highlighted as important, as new and less-established technologies could play a significant role in future energy systems.

Question Nine

“Would you say that its not necessarily about the type of technology, but more of a case of defining what’s going to be available for green purposes or green technologies, without necessarily specifying 20% for wind, solar etc? Would you say that it’s more about how these green technologies will allow these new and emerging technologies to come through also, as opposed to splitting it up specifically?”

The respondent states that this is exactly what they are trying to achieve. While defining specific areas for development can be beneficial, different technologies have varying requirements, meaning a single approach will not suit all cases. Supporting the allocation of land for a range of potential uses can provide flexibility, reflecting the diversity of technologies and land needs. However, flexibility should be underpinned by appropriate evidence and research. Without this, there is a risk that allocated areas may ultimately prove unsuitable, or that policies become a procedural “tick box” without delivering meaningful outcomes. Overall, an effective approach should balance openness with informed decision-making, ensuring that land allocation is both adaptable and grounded in robust analysis.

Another interviewer comes in and asks a question surrounding local search areas. The interviewer’s concerns regarded the preclusion of other development if local search areas were to be identified. The interviewer asks **if we were to allocate a local search area that might have come through the work we have done so far for solar developments, would we then be precluding another potential use?**

The respondent notes that the wording and structure of policy can influence how designated areas are interpreted. Where sufficient background work has been undertaken, strategic search areas can provide confidence that suitable sites are likely to exist within them. However, challenges arise when viable opportunities fall outside these identified areas. While policies may strongly support development within designated zones, they can unintentionally create barriers for equally suitable sites beyond them. This highlights the need for policy language that supports identified areas while still allowing flexibility to accommodate high-quality proposals that emerge elsewhere.

The respondent further states that, from a development perspective, there is a preference for approaches that maximise opportunities, reflecting a broader belief in the importance of delivering renewable energy projects for wider societal benefit. The respondent questioned whether moving away from defined search areas could result in all projects being treated equally, potentially reducing clarity or levels of support typically associated with identified locations. There exists a tension between maintaining flexibility and ensuring a clear, supportive policy framework for development.

Different levels of policy support are likely to emerge once detailed constraints and assessments are considered. However, uncertainty can arise around how proposals outside clearly identified areas are treated—whether they receive no support, implied support, or are disadvantaged compared to designated locations. The respondent highlighted the potential value of identifying broadly suitable areas, while still allowing flexibility through open criteria for renewable energy development. At the same time, there was recognition that this flexibility has limits, as it is not always possible to anticipate or accommodate all future or emerging technologies. The respondent expressed a degree of uncertainty, noting that both structured and flexible approaches have advantages and drawbacks, and that a balance may be required.

The interviewer clarified that they are leaning more towards a criteria-based policy as opposed to identifying local search areas.

Respondent two outlined that strategic search areas can be a useful policy tool, particularly as a starting point to help guide where development activity might begin. They provide an initial focus for site selection but should not be treated as definitive or restrictive. From a developer perspective, such areas can help identify where to direct early attention, though they are not sufficient on their own to determine project suitability. There is broad recognition that this remains an ongoing debate, with both advantages and limitations. A balanced approach may be most effective, combining clear overarching policies at a wider level with search areas that help guide, rather than dictate, development. However, there is also a consideration that identifying and maintaining such areas could present additional resource and administrative challenges for local authorities.

Question Ten

“Just to go back quickly to grid connection, do you have any other thoughts around potential grid constraints in the borough that could impact the pace and location of renewables deployment?”

The respondent noted that, within the study area, grid constraints are driven more by limited capacity than by the availability of connection points. In some cases, network upgrades (e.g. transformer improvements) have been required to accommodate development, reflecting a broader, longstanding issue in more rural regions where infrastructure is less developed. The respondent explained that while urban or more populated areas tend to have more connection points, these are often already heavily utilised, resulting in capacity limitations. Overall, grid capacity was identified as a significant constraint, and further investigation would be needed to provide a definitive assessment at the local level.

The respondent also highlighted ongoing grid connection reforms, noting that these may influence the distribution of technologies across different areas. There is an emerging strategic approach to allocating certain technologies to specific locations, which could present challenges where local development patterns do not align with these priorities.

Question 11

“Coming back to community energy, local supply, and tangible benefits for local communities, **do you have any thoughts on the role that the plan could play in supporting that as part of bigger developments and projects? How can we ensure this?**”

The respondent suggested that while policy can easily include requirements such as shared ownership or community benefits, successful delivery depends heavily on the commitment and openness of the local authority. They emphasised the importance of a proactive approach, with willingness to explore opportunities rather than relying solely on policy wording. Drawing on experience, the respondent noted that positive outcomes often arise where there is flexibility and a collaborative mindset. This can include going beyond financial contributions to consider wider community engagement, such as educational initiatives or support for local businesses.

The respondent further highlighted a gap that can arise between policy intentions and real-world implementation, stressing that stated ambitions must be matched by practical action. In their view, effective community benefit delivery depends on understanding local needs, as these vary significantly between areas and projects. Finally, the respondent observed that while developers are sometimes assumed to have extensive financial resources, many projects operate within tight margins. However, they noted that meaningful community benefits do not always require significant funding; smaller, more flexible initiatives can still have a substantial positive impact.

Question 12

“**Do you have any thoughts around how we could best look at monitoring, reviewing our energy targets and anything that you're aware of that could help facilitate that framework?**”

The respondent asked for clarification on the question, asking if the interviewer means monitoring throughout the length of the plan period, up until 2035, to which the interviewer confirms is correct.

The respondent acknowledged that while ongoing monitoring is important, identifying the most effective method is challenging and may extend beyond the plan itself into broader economic or business processes, such as engagement with SMEs and startups.

They highlighted the importance of considering impacts beyond headline outputs (e.g. installed energy capacity). For example, while major components for projects like wind farms are often sourced internationally, there are opportunities to support local supply chains through smaller contracts (e.g. maintenance, services, and site operations). In some cases, authorities have requested detailed data to evidence local economic benefits, such as workforce origins and spending patterns.

This suggests that monitoring should take a broader approach, capturing not only energy generation metrics but also wider socio-economic impacts within the area. While standard measures like carbon savings and household energy equivalents are commonly used and are useful, they do not fully reflect the broader benefits that such developments can deliver.

Question 13

“Just picking up on a point you made earlier about the lack of opportunity now for new wind developments. National planning policy talks about repowering existing turbines when they reach their end of life. **Are there any barriers to that, looking long term, beyond the LDP, identified by yourselves?**”

The respondent described the complexities of end-of-life options for wind farms, highlighting two main approaches: life extension and repowering. Life extension involves assessing existing infrastructure and, where viable, continuing operation for a further period with minimal additional impacts or disruption. While this prolongs existing environmental and visual effects, it avoids the need for new construction.

Repowering, by contrast, is significantly more complex. Although it is often perceived as a straightforward replacement of turbines, in practice it functions more like a new development. Advances in turbine technology mean that newer models are larger and require different layouts, increased separation distances, and new foundations. This introduces fresh environmental and planning considerations, alongside constraints such as proximity to properties and grid capacity. As a result, not all existing sites are suitable for repowering, and some may be decommissioned entirely due to financial or technical limitations.

The respondent emphasised that repowering should not be seen as a guaranteed solution for maintaining or increasing renewable energy capacity. Instead, there is a need to account for the potential loss of existing capacity over time as older schemes are retired. This has implications for monitoring and target-setting, as baseline capacity may decrease as well as increase.

They also pointed to opportunities beyond large-scale wind development, particularly in areas where constraints limit such schemes. Smaller-scale solutions, such as single turbines in industrial or brownfield settings, may offer more feasible and incremental gains. Similarly, technologies such as rooftop solar on commercial or industrial buildings were identified as practical, scalable, and cost-effective options. While

individually modest in output, these smaller interventions could collectively make a meaningful contribution to renewable energy targets.

Question 14

“I know you deal with large scale, so it's unlikely that you'd be doing anything that's off grid. **Do we, within the plan and within policy, refer to the potential for off-grid capacity that goes straight to an off-taker, or is there a way to do that in an open and flexible way?**”

The respondent expressed strong support for smaller-scale and decentralised energy solutions, noting their potential to contribute meaningfully to overall energy supply. However, they highlighted challenges in how such schemes are accounted for within formal targets, particularly in terms of measurement and monitoring. While these initiatives may reduce demand on the electricity grid—especially in energy-intensive industrial settings—it can be difficult for authorities to track their outputs due to limited direct oversight or data access.

They also noted that such developments could have wider system benefits, including freeing up grid capacity by reducing reliance from large energy users. This reinforces their value, even if they are harder to quantify within traditional monitoring frameworks.

The discussion also pointed to the growing importance of energy storage, particularly battery systems. These were identified as a distinct but complementary element of the energy landscape, with different spatial and planning considerations compared to generation technologies. Battery storage can be accommodated in a range of settings, including industrial or commercial environments, and plays a key role in improving system flexibility. Overall, the participant emphasised that flexibility and integration across different technologies are becoming increasingly important in energy planning.

Closing Statements

The respondent expressed that the organisation is always happy to help with the LDP and any potential renewable energy matters in the future.

No other closing remarks were made.