



## Climate Change, Environment and Infrastructure Committee meeting - renewable energy generation in Wales

## Delivering net zero

The energy sector is undergoing a significant and exciting period of change as the UK works towards a net zero carbon future and WPD is at the heart of this movement.

WPD is a Distribution Network Operator, with Distribution System Operator (DSO) capabilities, responsible for distributing electricity to 8 million customers, and serving more than a quarter of the UK. We look after a network of wires, poles, pylons, cables and substations, delivering power to homes and businesses across the West Midlands, East Midlands, South Wales and the South West

Net zero cannot happen without us and our leadership will directly impact the pace and efficiency with which it is achieved. At WPD we take this responsibility very seriously; we are determined to achieve a sustainable energy future by delivering a dynamic, innovative and high functioning energy grid that stands ready to serve many generations to come.

We are revolutionising the electricity network - not simply tweaking or evolving what we do. Change is already well underway, with unprecedented levels of flexibility, efficiency and new distribution system operator capabilities already in place. Throughout the next decade we will dramatically accelerate the rate of this change, placing customers at the heart of a swift and effective transition to a smart, decarbonised energy future.

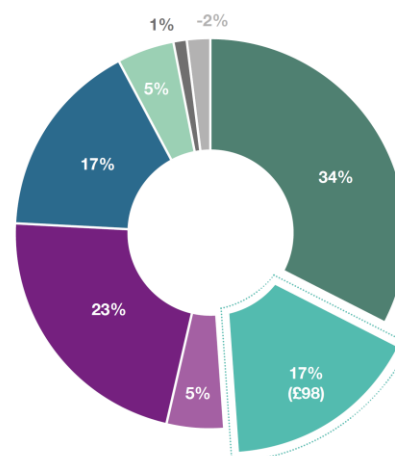
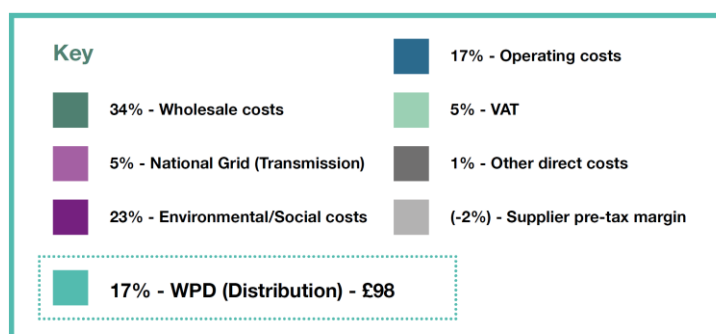
We will lead and actively drive the nation's move to decarbonisation. Through targeted green investment, the widespread rollout of flexibility services and the development of entirely new products, services and digitalised solutions we will unlock the network capacity our customers need in order to adopt low carbon technologies at scale. We will also collaborate with our regional stakeholders to enable them to achieve their aspirations, building transformational local area energy plans that maximise ambitions.

In the next price control period, as detailed within our [ED2 Business Plan](#), we will be significantly increasing the expenditure on the network, largely in investing in new capacity and digital technologies to accommodate the growth in renewables and other low carbon technologies.



We will do so, whilst keeping bills across our region, broadly flat. WPD's contribution to the average domestic bill across our regions is 17% or £98.

Figure 1.7 WPD's proportion of the electricity bill

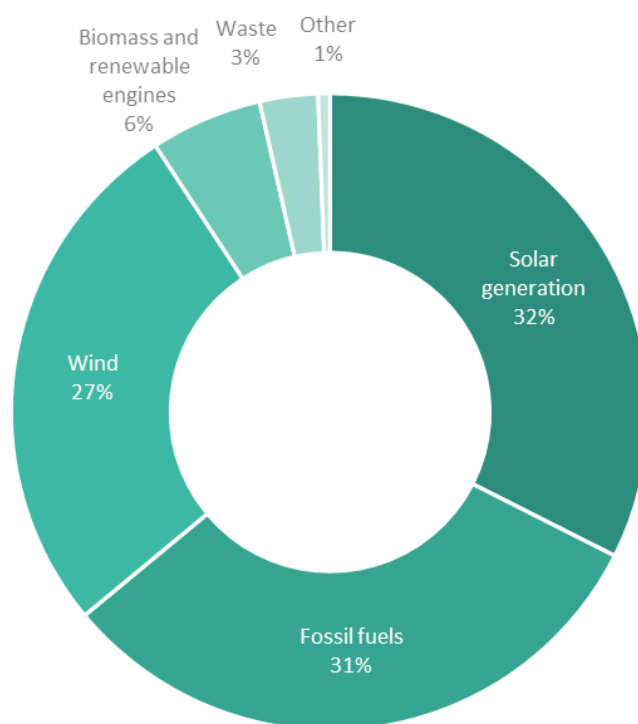


### South Wales to date

As of April 2021, there is 2.1 GW of distributed generation in the South Wales licence area, 1.4 GW of this is low carbon or renewable generation. This distributed renewable generation capacity accounts for around 3% of the total distributed renewable energy capacity in GB, enough to power around half a million homes.

Distributed electricity generation capacity in the licence area has increased significantly over the last 5 years, with over 50% of capacity having connected since 2015. Most of the generation capacity in the licence area is split between solar PV, fossil fuels and onshore wind. The significant capacity of onshore wind in the licence area is partly due to good wind resource in South Wales, but also the supportive planning regime for onshore wind from the Welsh Government. This has led to the development of several large-scale wind farms, such as the 57.4 MW Brechfa Forest West wind farm in Carmarthenshire.

Electricity demand has changed more slowly. Only 0.5% of South Wales homes currently have a heat pump and the same proportion of cars are battery electric. However, this is expected to change quickly, as new policies encourage decarbonisation of heat and transport.



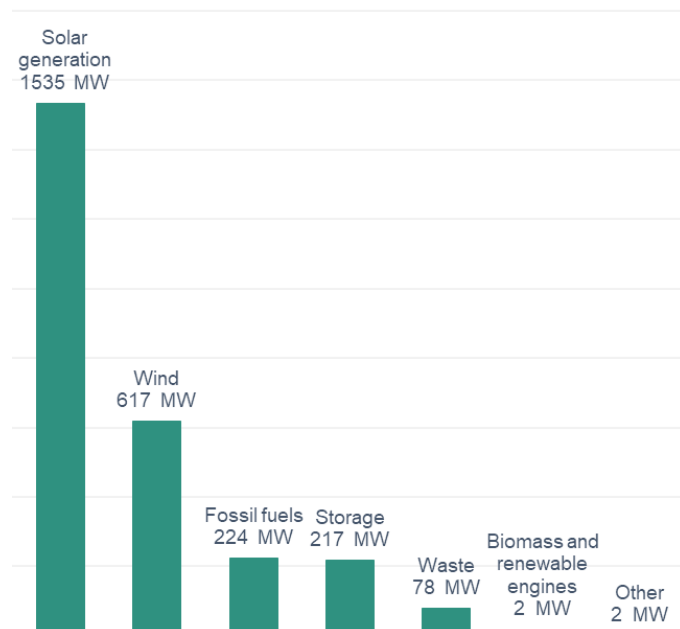
Total distributed energy generation in the South Wales licence area

### Near term pipeline Summary

There are over 190 generation and storage projects, totalling 2.7 GW that could connect to the South Wales distribution network in the near future. These pipeline projects were assessed for planning status, participation in auctions, and via direct discussions with developers. Increased activity in solar and onshore wind development has seen the pipeline increase significantly in recent years. Over half the pipeline capacity secured a network connection offer since January 2020.

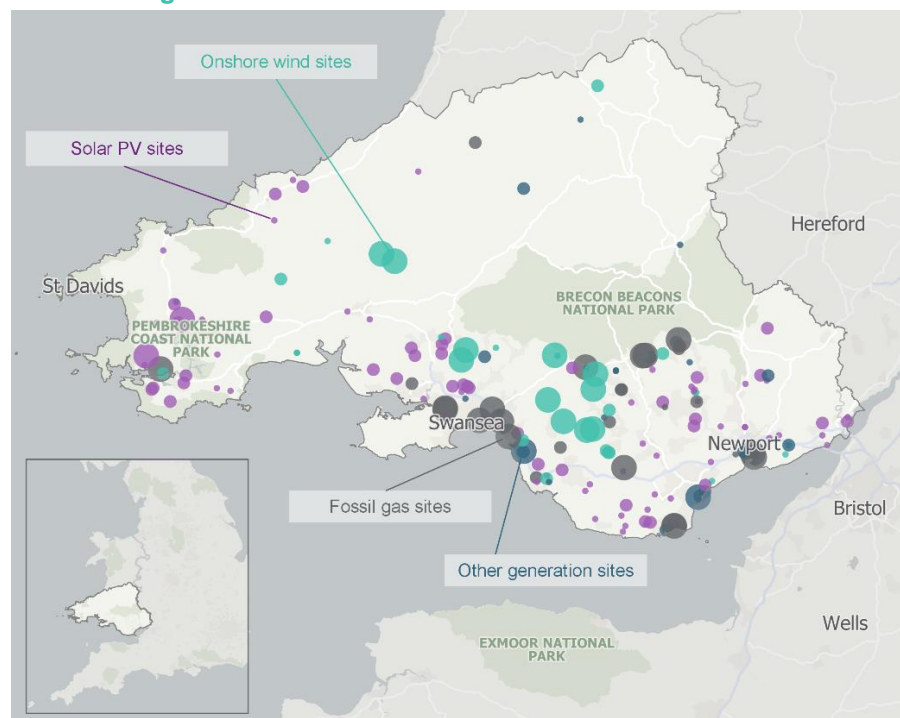
In contrast to the English licence areas, a positive planning environment for onshore wind has resulted in a pipeline of over 600 MW in the South Wales licence area. As seen in other licence areas, solar PV has high levels of interest, including 12 potential large-scale sites of 40 MW or greater.

A National Grid Electricity Transmission restriction on new thermal plants and battery storage in the South Wales licence area previously restricted development of these technologies. As of September 2020, this has been lifted and over 200 MW of potential battery storage capacity has since entered the pipeline.



Generation and storage sites with an accepted connection offer in the South Wales licence area

## Distributed generation in South Wales



Distributed generation is mainly clustered along the south of the licence area, due to the greater density of network and transport infrastructure, and population. Solar PV sites are present across the licence area, with several large-scale solar farms located in Pembrokeshire, where irradiance is highest. Many large-scale wind farms, such as the 57 MW Brechfa Forest West wind farm, have been deployed in the South Wales Valleys, reflecting Welsh Government planning policy. There are also several large fossil gas and biomass sites in the licence area, particularly in the South Wales Industrial Cluster around Swansea and Port Talbot.

Through our Distribution Future Energy Scenario work, we provide a rich dataset of regional forecasts for developments across demand, generation and storage. The summary table below shows the forecast renewable energy and energy storage capacities expected to be deployed across the four energy industry scenarios used.

DFES scenario	Description of scenario	Baseline Renewable energy capacity	2035 Renewable energy capacity	Baseline Energy storage capacity	2035 Energy storage capacity
<b>Steady Progression</b> <i>Not net zero compliant</i>	Not compliant with the net zero emissions target. Low levels of decarbonisation and societal change.	1.4 GW <i>Including: 0.7 GW of solar 0.6 GW of wind</i>	2.2 GW	0.7 MW  Less than 1% of the GB total installed battery storage capacity.	55 MW
<b>System Transformation</b> <i>Net zero compliant</i>	High level of decarbonisation with lower societal change. Larger, more centralised solutions are developed. This scenario has the highest levels of hydrogen deployment.		3.0 GW		119 MW
<b>Consumer Transformation</b> <i>Net zero compliant</i>	High levels of decarbonisation and societal change. Consumers adopt new technologies rapidly, and more decentralised solutions are developed. This scenario has significant electrification of domestic heat.		4.2 MW		256 MW
<b>Leading the Way</b> <i>Net zero compliant</i>	Very high levels of decarbonisation and societal change. Consumers adopt new technologies rapidly, and a mix of solutions are developed. This scenario aims for the "fastest credible" decarbonisation pathway.		4.5 GW		331 MW

### Developing a future network for Wales

The Welsh Assembly Government has ambitious renewables goals including a target of meeting the equivalent of 70% of Wales' electricity demand from Welsh renewable electricity sources by 2030. They have undertaken a study to identify a series of high priority sites for onshore wind and solar development but this recognised the importance of interdependencies between distribution and transmission infrastructure and the need for electricity network upgrades. It has also undertaken an assessment of the future potential for offshore wind in Wales and found that there is potential for an additional 3.5 GW by 2030 based on site extensions and new leasing. Meeting these ambitions requires a different order of investment than our incremental plans.

The sparsity of existing infrastructure in mid-Wales is a particular barrier to harness the great potential of renewable energy generation available. Solutions to providing this infrastructure are likely to require both transmission and distribution input, across multiple licenced entities. It will also require significant input into quantifying the deliverable ambition of the Welsh energy sector to ensure the infrastructure provided by network companies is fit for 2050.

We welcome the summary recommendations from the renewable energy deep dive, particularly around the need for a Wales Energy System Architect and a national energy plan by 2024.

We plan to assist in the acceleration of the creation of a national energy plan for Wales by the Welsh Assembly Government, working jointly with energy network companies that operate within Wales. Our joint goal is to help support the development of an energy strategy by working together to develop and optioneer regional pathways, together with National Grid transmission and Scottish Power Energy Networks (SPEN). This will involve:

- **Support establishing a governance structure:** the development of the energy system is dependent on a number of parties including the electricity, gas, hydrogen and transport network companies, the Welsh Assembly Government, and Ofgem. To ensure that there are smooth working relationships and clear acknowledgement of roles and responsibilities between parties we will support the establishment of a clear governance structure to drive forward development.
- **Engagement:** We will engage heavily with stakeholders to ensure a joined-up approach, enabled by the relevant sharing of information. This is key to the success of this endeavour as first we must understand the Welsh Assembly Government's top down ambitions and constraints, and then use this to inform our engagement with the other networks to identify and assess potential networks solutions. This will include engagement to capture where the decision and actions are being taken at a more local government level.
- **Detailed bottom-up options analysis:** detailed analysis need to be undertaken of potential whole system solutions to the challenges faced by the Welsh energy system. This will include considering different points of connection of large developments, identifying different technological and capacity solutions, understanding key interactions between distribution and transmission networks, etc. This will allow us to develop a comprehensive technical understanding of the network issues posed by different potential energy vectors and energy scenarios.
- **Development of coordinated plan:** It is likely that certain detailed design works will need to be undertaken in RIIO-ED2 and potential some pre-construction and construction activities too. As part of the developing the plan, we will set out the route map for the development of the electricity network in Wales in terms of: which investment might be required, what their triggers/dependencies are, which works need to be progressed immediately, and any regulatory mechanisms that will be utilised to the deliver the investment.

Within WPD's final business plan for ED2 (2023-2028), we have included £2m for developing the Welsh energy plan, signifying the commitment we have to providing engineering input and resource to accelerate renewables in Wales.

### Smarter networks

WPD is leading an energy revolution, delivering a smart, digitalised electricity network to enable net zero for our stakeholder by as early as 2028. We are driving the shift towards a low carbon, net zero future for our customers and work is already well underway to transform the energy grid to achieve this. Over the five year period 2023-2028 we will turbo charge the pace of that change in order to meet the energy needs of our customers today and create a sustainable future for generations to come.

Net zero cannot happen across our regions without WPD. We take this responsibility very seriously and are determined to be highly ambitious, adaptive and efficient in everything we do. This in turn will ensure that our route to net zero is quick, effective and seamless for our customers. Above all, the smart future must be inclusive for all, so we will ensure no one is left behind in the shift to adopt and benefit from low carbon technologies (LCTs). We are already transforming our operations, services and processes by delivering unprecedented digitalisation and innovation to meet the needs of our customers in a zero carbon future. The way our customers generate and consume energy is changing rapidly and significantly and we will support consumers to widely participate. This includes providing new opportunities and developing markets for demand side flexibility ([www.flexiblepower.co.uk/western-power-distribution](http://www.flexiblepower.co.uk/western-power-distribution)) and supporting local areas in creating local area energy plans to enable improved whole system planning. To date, we have engaged with all 130 local authorities within our region and provided them with specific data on baseline and forecast electricity information. We also operate the largest distribution network flexibility portfolio, at 709MW contracted.

### Supporting our customers in the energy transition

We will ensure customers are not left behind in the smart energy transition by offering at least 600,000 Priority Services Register customers a bespoke smart energy action plan each year. This activity will be targeted across our regions based on the vulnerability of those customers served within those localities, levelling up across our service area. We will offer customers the opportunity to develop a smart energy plan tailored to their circumstances and to be referred to a range of expert partner agencies delivering long lasting support to enable them to participate in smart services, including flexibility markets.

Full details of our commitment can be found in our [Customer Vulnerability Strategy](#). Our separate paper for [CVP 5](#) (Customer Value Proposition) sets out in detail the annual expenditure of £1 million to fund this activity and the vast range of benefits it is expected to lead to, including SROI analysis to quantify the customer value of the positive outcomes achieved. In the 5 year period it is predicted that this action will deliver a net present value benefit of £4.8 million.

In our Customer Vulnerability Strategy we have also set out a wide range of measures to which energy efficiency advice and measures are critical. For example, our commitment to save at least 113,000 fuel poor customers over £60 million by 2028 includes support interventions that focus on the installation of energy efficiency measures and behaviour advice in relation to energy saving and reducing consumption.

We have also proposed expenditure of £0.3m per year to deliver smart energy outreach trials for vulnerable customers. This will feature a range of pilot schemes to enable vulnerable customers to participate in and benefit from new services associated with energy transition and the achievement of net zero.

### Accelerating community owned renewables

WPD is strongly committed to leading the way in the transition towards a greener, more sustainable energy distribution industry. At the same time, this process must be inclusive, enabling customers to participate and access the potential benefits that decarbonisation brings. In this context, WPD wants to make a difference in the local communities it serves.

In [CVP 6](#) we set out in detail our proposal to deliver an annual £1 million 'Community Matters' Fund, funded entirely by shareholders, to achieve positive community outcomes in relation to vulnerability, environment and education. We will support 300,000 vulnerable people in various communities across our region. To support this activity, this proposal also entails establishing a volunteering scheme encouraging staff to volunteer at local community projects.

The fund will support low carbon initiatives, energy saving projects or climate change activities that engage communities in the net zero transition and promote environmental awareness and understanding.

Based on SROI analysis of the intended benefits, as well as direct savings to customers as a result of our actions in this area, in the 5 year period it is predicted that this action will deliver a net present value benefit of £16.7 million.

[wpdnetworkstrategy@westernpower.co.uk](mailto:wpdnetworkstrategy@westernpower.co.uk)

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Western Power Distribution (East Midlands) plc, No2366923  
Western Power Distribution (West Midlands) plc, No3600574  
Western Power Distribution (South West) plc, No2366894  
Western Power Distribution (South Wales) plc, No2366985  
Registered in England and Wales  
Registered Office: Avonbank, Feeder Road, Bristol BS2 0TB

[wpdnetworkstrategy@westernpower.co.uk](mailto:wpdnetworkstrategy@westernpower.co.uk)

