

EVC2 SP Energy Networks

Senedd Cymru | Welsh Parliament

[Pwyllgor Newid Hinsawdd, yr Amgylchedd a Seilwaith | Climate Change, Environment and Infrastructure Committee](#)

[Gwefru cerbydau trydan | Electric vehicle charging](#)

Ymateb gan SP Energy Networks | Evidence from SP Energy Networks

1. What are your views on the Action Plan?

SP Energy Networks owns and operates the electricity distribution network in north and mid-Wales (Anglesey, Gwynedd, Conwy, Denbighshire, Flintshire, Wrexham, Ceredigion, and part of Powys), Merseyside, Cheshire, and North Shropshire (our SP Manweb network) and in Central and Southern Scotland (our SP Distribution network). It is through this network of underground cables, overhead lines, and substations that our 3.5m customers are provided with a safe, economical, and reliable electricity supply. In Wales, this distribution network supports 0.45m homes, businesses, and public services every day.

We develop our network to meet our customers' evolving needs. To do this, we first need to understand what these needs are – we do this by creating forecasts [1] across a range of scenarios out until 2050. These forecasts show a considerable increase in EVs in the area of Wales that we serve (99k-284k by 2030; 500k-703k by 2050). We are therefore pleased that the Welsh Government has an action plan to deliver the EV charging infrastructure necessary to enable this, including sufficient public charging provision to ensure that those without at-home charging are not left behind.

We are also pleased that the Welsh Government see us as a key stakeholder in both their EV Action Plan and Strategy, as sufficient capacity on our network is key to enabling the roll-out of EV charging infrastructure in Wales. We are committed to working with the Welsh Government and other network operators to deliver a network ready for Net Zero. We aim to invest over £615m in our electricity distribution network in Wales in RII0-ED2 [2], supporting hundreds of jobs and enabling the decarbonisation of heat and transport that is crucial to deliver Wales's climate change targets.

[1] Distribution Future Energy Scenario (DFES) forecasts, available here:

https://www.spenergynetworks.co.uk/pages/distribution_future_energy_scenarios.aspx

[2] Our network investment is regulated by Ofgem via a price control. On 30 November 2022 we received final notification on our permitted investment (and the associated incentive and penalty regime) for the 1 April 2023 to 30 March 2028 period. This period and the price control mechanism are known as RIIO-ED2.

2. What are your views on progress made against Action 1: Charging infrastructure?

As a Distribution Network Operator (DNO), regulations do not typically permit us to own and operate EV chargepoints; we support the transition to electrified transport through ensuring that the electricity network is able to accommodate the connection of low carbon technologies (LCTs) such as EV chargers. Our response to Question 3 gives some examples of how we do this.

3. What are your views on progress made against Action 2: Optimisation of energy provision?

We welcome the overall theme of Action 2 and agree that DNOs are essential to delivering electricity network capacity to enable the roll out of EV chargers. Below we have set out the key areas we are working on to optimise energy provision in Wales and support EV adoption.

The changing energy landscape in Wales

The network landscape is changing fast. As society decarbonises to Net Zero, our customers are increasingly turning to electric vehicles (EVs) and heat pumps. We are also going to see a further leap in renewable generation to power these, more customers actively participating in the energy system, and the electricity system operator (ESO) increasingly needing to utilise distribution-connected service providers. These changes will result in higher network utilisation, more dynamic and volatile power flows, more complex distribution network planning and operation, and increasing whole system interactivity.

Ensuring sufficient network capacity and capability

We must respond to these changes to accommodate our customers' evolving needs, enable Net Zero, and ensure the continued safe, reliable, and efficient operation of the distribution network and wider energy system for customers.

To accommodate this growth we need to invest in the capacity and capabilities of our network. The RIIO-ED2 price control (1 April 2023 to 31 March 2028) will be a critical time in this regard. Over RIIO-ED2 we will invest £615m to create the additional capacity and tools our customers need. For example in our area of Wales:

- Investing across all voltage levels to add capacity for our customers. This includes investing in the replacement of over 5,700 services to our customers' homes, nearly 200km of new distribution circuits, and 600 substations so customers have the network capacity they need to safely charge their EVs.
- Using 135MW of flexibility services across 241 sites to defer the need for reinforcement, meaning capacity is ready for customers more quickly and at lower cost.
- Over 2,000 more substation monitors and new digital tools (see below), so we have better visibility of the network and can safely get more use out of the existing network capacity which customers have already paid for.
- Investment in our assets to ensure our network is reliable and resilient, which reduces power cuts and so helps support a high 'up-time' for installed EV chargers.
- A range of measures to accommodate more renewable generation, so that EV chargers are powered with zero carbon electricity.
- We will undertake a series of investments in RIIO-ED2 to promote the development of efficient, coordinated, and competitive flexibility markets, so that customers with EV chargers can more actively participate in the energy system if they wish.

These and other investments will help enable up to 250k EVs on our Welsh network by 2028.

The Welsh Government's continued support throughout the RIIO-ED2 price control process, including engaging during our DFES development, has been instrumental in demonstrating the requirements of electricity customers in Wales and helping to secure the investment needed.

Digital network twin – our Engineering Net Zero (ENZ) Model

Action 2 includes the aim of using digital modelling. We are industry leaders in this field and use several enhanced forecasting and modelling tools. We have developed a highly granular EV forecasting tool that predicts which customers will get EVs and in what timescales. Coupled with our new ENZ Platform tool [3], this means we can better predict where and when network capacity is needed in Wales. This forecasting data is publicly shared, informed by stakeholder input, and underpins our network investment plans.

One key publication is our Network Development Plan. This sets out the indicative demand and generation capacity available at each primary substation, and details information on the interventions we plan that will increase capacity.

[3] Our ENZ Platform is the analytical platform at the centre of our network planning and development. It integrates previously independent data sources (network monitoring, smart meters, enhanced forecasting, asset condition) with a full digital model of our network. This gives us data-driven visibility of what is happening on the network right now, and what will happen in planning and operational timescales. It helps us provide the capacity our customers need in time, make more efficient investment decisions, and get better use out of existing network capacity.

Green Recovery – EV Charging in North Wales

In 2021, Ofgem approved £2m of investment for us to provide network infrastructure to deliver 21MW of EV charging capacity across 25 sites across the strategic trunk road network in north Wales, in both rural and urban areas. Examples sites include the Rhug Estate stop on the A5 at Corwen, which now has 8 instavolt rapid chargers, and EV charging near Blaenau Ffestiniog's busy train station.

We are currently working closely with the Welsh Government and Transport for Wales as part of the Green Recovery to deliver this investment programme, to create new electricity capacity to support the rollout of rapid EV charging. Work started in spring 2022 and is set to be completed by spring 2023.

The targets set out at the beginning of the programme were extremely ambitious, and only possible through close working between the parties involved. This work has transformed the EV charging landscape in North Wales and will create an enduring benefit for residents.

More information is available at:

https://www.spenergynetworks.co.uk/pages/green_recovery_investment_england_and_wales.aspx and

<https://www.ofgem.gov.uk/publications/decision-riio-ed1-green-recovery-scheme>

Innovation

Our ongoing innovation project, Project CHARGE, aims to accelerate the transition towards electrified transport.

Project CHARGE analysed and compared network capacity and EV driver behaviour projections and anticipated traffic flow. The resulting data highlights beneficial locations for EV charge points across our SP Manweb network, including in Wales.

As part of the project, we are launching an interactive map that will highlight to customers good locations for investing in public charging infrastructure. The publicly available interactive online tool (called ConnectMore, currently in testing and development) is a user-friendly web application that shows users where EV charging demand is, and where the electricity network has the capacity to support charge point installations.

We believe this joined up approach bringing transport and electricity network expertise together for the first time will enable the sharing of data to create a network that will meet the needs of EV drivers in our region now and in years to come.

Collaborative Engagement

Action 2 includes a KPI to establish a connections working group between the Welsh Government, chargepoint operators, and network operators. We engage extensively with the Welsh Government, for example:

- During the development of our DFES forecasts and RIIO-ED2 Business Plan (which together inform the investment in our Welsh network).
- The Energy Networks in Wales working group.
- The 'Future Energy Grid for Net Zero' project.
- Green Recovery investment.
- The National Advisory Group on the LAEP programme in Wales.

We also currently engage with many of the Local Authorities in our licence area in Wales, seeking to support their plans to roll out EV charging infrastructure.

During RIIO-ED2, we plan to spend £3.65m on strategic engagement activities with all Local Authorities, helping with their local decarbonisation plans and expedite public EV chargepoint installation. For example, we will have a new team of 'Strategic Optimisers' who will be in place from April 2023 and will engage with all Local Authorities on their decarbonisation plans and LAEPs in a systematic way, ensuring that we are giving equal support.

We will also contact these Local Authorities to work with them on EV optioneering works for public EV charging. We will prioritise works in areas where there is currently no market interest in installing public EV charging infrastructure, accelerating EV uptake and stimulating a market where commercial players can operate successfully in the future. Using our network insights and technical capabilities, alongside the Local Authorities' knowledge of the local area, we will help to create savings and speed up public chargepoint installation timelines. This will help enable universal access to public charging infrastructure.

4. What are your views on progress made against Action 3: Enhanced rapid charging provision?

Our Green Recovery and Project CHARGE work has gone some way in supporting the rollout of rapid EV charging in Wales. Our plans to work with the Welsh Government and Welsh Local Authorities with their local decarbonisation plans will also provide future support. Please see Question 3 for more details about these initiatives.

5. What are your views on progress made against Action 4: Welsh quality standards?

6. What are your views on progress made against Action 5: Regulatory facilitation?

Future Requirements for Electrical Supply to Buildings

Action 5 includes the aim for the Welsh Government to “work with the electricity industry to facilitate a further review of the requirements for electrical supply to buildings for future resilience that incorporates potential charging needs”. We would welcome and support the Welsh Government should they choose to undertake this review.

Our own detailed forecasting and modelling work (see Question 3) shows that EV charging at home will be a key driver of increasing domestic consumption. As there are other factors that will also affect a building's consumption, any review of building regulations should holistically consider all factors to ensure the updated regulations are robust. Other factors that the updated regulations should consider are:

- The electrification of heating: the capacity of a new building's electrical supply must be sized to accommodate EVs, electrified heating, and normal background building demand (e.g. white goods, lighting etc).
- The role energy efficiency (especially thermal efficiency) has in a reducing a building's demand.

- Behind-the-meter generation (e.g. rooftop solar PV) and storage.
- The criticality of a building's supply as customers become increasingly dependent on electricity for heat and transport.
- Changing consumption patterns – demand may step-change in response to market signals, and buildings may increasingly export power from installed storage and vehicle-to-grid technology.
- The potential limitations of a single-phase electricity supply in accommodating customer LCT growth (e.g. EV chargers and heat pumps), and the role that three-phase supplies could play.

Low Carbon Technology (LCT) Notification

We would welcome Welsh Government support in ensuring that DNOs are notified when customers have LCTs, including EV chargers, installed in their homes. This will help ensure that we are able to focus our investment programme in areas of high uptake and that customers do not face any supply or safety issues. We have developed an industry leading app (iDentify) which enables LCT installers to capture and submit details of new installations via their smartphones instead of a paper form. We are currently receiving low levels of notifications in relation to overall uptake levels.

We would also welcome early sight of wider plans within our geographical licence area. For example, if the Welsh Government plan to target specific areas in the roll out of EV chargepoints, we can build this into our own investment plans, ensuring we are not a blocker to progress.

Agile Network Regulation

Although not within the Action Plan, the regulatory regime that DNOs are subject to is relevant. DNOs have recently received their Final Determination for the RIIO-ED2 period, in which Ofgem have set out DNOs approved baseline expenditure between April 2023 and March 2028. However, Ofgem have set out windows within this period (called Uncertainty Mechanisms) in which DNOs can apply for additional funding should technology uptake (such as EVs) be higher than our baseline forecasts. We would therefore welcome the support of the Welsh Government as we move through the price control to ensure that ambitions can be met, and that the distribution network is not a blocker to the EV strategy.

7. What are your views on progress made against Action 6: Partnership and collaboration?

This action is primarily aimed at chargepoint operators, however we are happy to support Local Authorities through our planned engagement initiatives (see Question 3).

8. What are your views on progress made against Action 7: Increase public awareness?

Public awareness is key to ensuring that there is a smooth and successful transition to EVs. We are therefore happy to support the Welsh Government's efforts where appropriate. For example, we are currently working on a joint communication with Welsh Government and Transport for Wales on the Green Recovery work referenced in Question 3. Such positive messaging will help to provide public with confidence in the EV charging network in Wales and make the transition to electrified transport.

9. What are your views on progress made against Action 8: Encourage investment opportunity and innovation?

We agree that deploying infrastructure for decarbonisation creates opportunities for developing economic activity, especially in the communities in which we operate. Using just transition principles, during 2023-2028, within our Welsh network, we will recruit approximately 350 employees and upskill and develop our existing workforce, supporting our people and providing high quality jobs in our communities. These jobs are valuable in supporting communities at a time of economic recession and a cost-of-living crisis.

We are also committed to supporting community anchor organisations and their community energy projects to deliver community energy solutions. These will be fundamental to the roll out of local network innovation and whole system solutions. We believe it is only right we play a part in building the capacity of such groups by investing in developing local knowledge and awareness of changes coming to the energy system, supporting local groups to participate in local energy schemes that meet their needs and through creating jobs and skilled, local workforces.

We are already supporting the aim of using "innovation to drive continuous improvement." For example, our Angle DC project was a UK-first innovation that got 25% more capacity out of the two 33kV cables which supply Anglesey, enabling further demand and generation growth. Getting best use out of existing capacity and delivering additional capacity more quickly are two key benefits of innovation.

10. What are your views on progress made against Action 9: Create synergies?

Achieving ambitious decarbonisation targets will require governments and industries working across vectors on a 'Whole System' basis to create and achieve synergies. We are already undertaking a range of work in this regard within Wales.

For example, we are currently supporting Conway Council on their local area energy plan (LAEP), by facilitating and enabling the LAEP objectives. From April 2023, we will have a new team of Strategic Optimisers in place who will use the learning from previous partnerships such as those with Conway Council to partner with local authorities and regional governments to support the implementation of public EV charging and heat electrification initiatives. More details of these initiatives are in our response to Questions 3.

Action 9 and the overall EV Charging Strategy for Wales include incorporating renewable energy to provide the energy for EV charging. Our area of Welsh distribution network currently has 1,300MW of distribution generation, with much more (700MW) in the pipeline, compared to 750MW of peak demand – this makes it a net exporter of energy at times. Examples of work we are doing to efficiently accommodate more renewable generation in Wales include:

- 11 new Constraint Management Zones covering 75% of our Welsh network. These enable renewable generators to connect under flexible connection arrangements, so avoiding the time delays of network reinforcements.
- Real Time Fault Level Measurement (RTFLM) and Active Fault Level Management (AFLM). A world-first innovation project we've led to help renewable generators connect more quickly and cheaply where they might otherwise cause expensive and lengthy switchgear reinforcements.
- Improving network visibility, including over 2,000 new network monitors. This enables us to safely operate the network closer to limits, so getting more capacity out of the existing network.
- Angle DC (see Question 9).

What are your views on the strategy ?

Our own DFES forecasts predict up to 284k EVs across mid and north Wales by 2030 and up to 703k EVs by 2050. We therefore welcome the strategy's recognition of the need for a significant roll out of EV charging infrastructure to support this EV uptake. We welcome the differentiation of different types of charging (e.g. at home, destination etc) and the need to ensure there is

sufficient public EV charging so that those without the ability to charge at home are not left behind.

We support DNOs being identified as a key partner; our responses within this submission set out many of the key activities we are undertaking to facilitate EVs on our network.

Do you have any other points you wish to raise within the scope of this inquiry?

Network capacity is key to enabling the EV charger roll out. Our responses to this submission only touch on some of the work we are doing to provide reliable and safe network capacity in an efficient and timely manner for our customers. For more information, our Future System Strategy provides a good introduction and overview to the full range of measures we are planning. It can be accessed at:

<https://www.spenergynetworks.co.uk/userfiles/file/Annex%204A.1%20-%20Future%20System%20Strategy.pdf>

Our Network Development Plan sets out capacity across our network and the interventions we are planning which will increase capacity (including non-load interventions which are not done to provide capacity but will increase capacity nonetheless, e.g. replacing an end-of-life transformer with a larger equivalent). It can be accessed at:

https://www.spenergynetworks.co.uk/pages/network_development_plan.aspx