

Written evidence submitted by Nova Innovation (GRD0026)

- 1) What are the current capacity issues facing the National Grid?
 - Nova Innovation is planning to develop a 2 MW marine energy (tidal stream) project in Bardsey Sound off the Llŷn Peninsula, but grid availability is limited to 0.2 MW. This is a barrier to a new source of renewable energy being developed in Wales. In turn, this is a barrier to delivering the benefits associated with developing a new industry in Wales such as local supply chain opportunities and socio-economic and local community benefits.
 - In Scotland, Active Network Management (ANM) systems are used to allow the grid to be optimised for generators and consumers. However, in north Wales the grid operator does not currently use ANM on their 11 kV network. These should be adopted in Wales as a matter of urgency to allow the grid to be optimised for local sources of generation – e.g. using ANM to enable local generators to work together e.g. a local wind farm, local solar farm with a local tidal farm) and optimise the grid to meet local demand.
- 2) How are the constraints on Wales' grid likely to be exacerbated as demand for renewable energy surges?
 - On the supply side, the grid constraints will delay and/or stop new renewable energy projects being developed. In relation to tidal stream energy (for which inshore Welsh waters have a significant proportion of the total UK resource), the tidal energy resource is located in remote areas where grid is highly constrained. With the current focus on energy security, we need to do more to develop our indigenous sources of renewable energy, rather than importing fossil fuels.
 - On the demand side, the grid constraints will constrain or slow the adoption of electric vehicles. With the shift towards net zero and the UK no longer enabling new petrol and diesel cars to be sold from 2030, there will be a bigger demand placed on the grid.
- 3) How can Wales unlock the grid and ensure that it is ready for future demand?
 - By encouraging or developing regulation that requires DNOs to use ANM, microgrids, flexible connections, energy storage and other technologies to address the issues.
 - The world is seeing a huge growth in micro-grids as consumers increasingly use local sources of generation to supply their power. A micro-grid helps to balance local supply and demand by linking consumers with sources of power and energy storage, through the use of smart communication and control systems. We should be doing more in Wales and the UK to make this happen.
 - Micro-grids are attractive as they bypass the high costs and long consenting times associated with building electricity grid infrastructure, such as pylons, to increase the capacity of the national grid. They also facilitate the transition to a greener energy supply by enabling the deployment of new renewable sources. Nova has developed a successful micro-grid system on the shores of Bluemull Sound in Shetland, where we have an operational array of four tidal stream turbines.
- 4) What can be done to incentivise investment in grid flexibility, in particular vehicle to grid technology and 'smart' charging?
 - Provide commercial incentives to generators, consumers and the grid operators.

- Develop an app that allows EV owners to charge their vehicle (EV owner pays for electricity) and discharge their vehicle (the EV owner gets paid for supplying power to the grid to meet peak demand) depending on the supply demand dynamic of the system, and the system to support this approach.
- 5) What should be done to ensure that the grid, particularly in rural areas, can cope with the extra demand that will be generated from the transition to electric vehicles?
- Please see the response to question 3 above (How can Wales unlock the grid and ensure that it is ready for future demand?)
- 6) What level of anticipatory investment in grid capacity is required by the UK Government in order to ensure that Wales can deliver its decarbonisation roadmap?
- Difficult to comment what this would be at the national level. It's about investing smartly to deliver a more cost-effective outcome – e.g. developing micro-grids that bypass the high costs and long consenting times associated with building electricity grid infrastructure, such as pylons, to increase the capacity of the national grid. They also facilitate the transition to a greener energy supply by enabling the deployment of new renewable sources.
- 7) How can the UK Government, the Welsh Government and Ofgem work together to improve grid capacity?
- By recognising the importance of the grid in the transition to net zero.
 - By recognising the changing requirements of grid with the transition to renewables, which are often located in rural areas with limited grid infrastructure.
 - By recognising the importance of the grid in the UK's energy security.
 - Introducing regulation to incentivise grid operators, generators and consumers to improve grid capacity and accessibility.
 - Follow Belgium's lead of developing Renewable Energy Communities (REC). A REC is a framework where consumers access locally generated and green energy via the local grid. As well as delivering environmental benefits, RECs improve energy efficiency and offer consumers a more cost-effective solution to their energy needs. For example, HospiGREEN in Tournai where renewable energy from three different sources (a wind turbine and two solar photovoltaic farms in different areas) are supplying local hospitals and businesses via the local grid within the REC area. There is no grid cost charged to the participants within the REC area.

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