Submission of written evidence to the Scottish Parliament's Net Zero, Energy and Transport Committee: Scotland's electricity infrastructure: inhibitor or enabler of our energy ambitions?

Question	Answer
Electricity Network Readiness	
1. **Do the current business plans from SSEN and SPEN (in relation both to transmission and distribution) allow for sufficient investment in networks to realise the Energy Strategy's ambitions?**	N/A
2. **To what extent are SPEN and SSEN able to alter investment plans in response to a fast-moving policy environment?**	N/A
System Resilience	
3. **What role will dispatchable* electricity sources - pumped hydro, battery technologies, thermal generation (hydrogen power, gas with CCS) - play in ensuring security of supply and system resilience? Should any other technology play a role in supporting Scotland's electricity system?**	Dispatchable electricity sources will play a vital a vital role in ensuring security of supply and system resilience. The electricity network will need to utilise a mixture of renewable energy sources, to maximise efficiencies of the electricity network as a whole, whilst ensuring resilience and security. Solar, wind, and tidal energy are intermittent energy sources, and it will be important to harness this renewable energy supply and utilise when energy demand is high.
4. **What are the key barriers to deploying these technologies and how should they be addressed?**	The key barriers to deploying these technologies are: • the capital investment required to deliver these large-scale renewable energy technology installations, • the condition and capacity of the existing electricity grid infrastructure across the country, and • the resource available within District Network Operators to deliver electricity infrastructure works within a suitable timeframe . Although on a significantly smaller scale, the problems highlighted and experienced with small scale (<10MW) local authority solar farms are an example of the electricity infrastructure issues. It is known that the electricity infrastructure in the country is dated and in need of upgrading/replacement and this would be the responsibility of the electricity network owners/operators to plan these works taking cognisance of the Scottish Government's draft Energy Strategy and Just Transition Plan, and the electrification of heat and transport. The number of students entering into college and university courses in Scotland, with a renewable energy element to it, has increased significantly over the last couple of years; industry needs to ensure jobs are created to facilitate these students upon leaving further education. These students will form the workforce to deliver Scotland's Energy Strategy.

5. Do proposed UK Government reforms to the electricity capacity market align with the Draft Energy Strategy? What barriers, if any, do you/your organisation experience in accessing finance to deliver net zero compatible investments?	Yes. We would like particularly to highlight the need for: • Increased funding for local authorities as a key delivery vehicle for net-zero • Streamlining of the external grant funding landscape • Less restrictions on funding, we often find that funding opportunities are only for project which are at a stage ready to outlay capital expenditure, whilst this is certainly important, we believe there is a need for funding support to develop proposal/projects to a stage where they need capital investment for delivery. If more funding was available for project development, this could potentially give rise to an increased volume of projects that are at a capital expenditure stage applying for funding. We are also of the view that timescales for external grant funding applications can be prohibitive, and the funding landscape could be streamlined to reduce complexity and widen the scope of eligible projects.
Wind Energy	
6. What are the key barriers to achieving the Scottish Government's ambition for onshore and offshore wind contained in the Draft Strategy; could the readiness of the electricity network to accommodate new projects affect the business case for the proposals?	As highlighted in previous questions in relation to 'System Resilience' the key barriers to deploying these technologies are: • the capital investment required to deliver these large-scale renewable energy technology installations, • the condition and capacity of the existing electricity grid infrastructure across the country, and • the resource available to deliver the electricity network works. Yes, the readiness of the electricity network to accommodate new projects affect the business case for the proposals, as this would impact on timeframes and the associated investment necessary to deliver the project.
7. Given the generation potential, and market ambition, is there a risk of oversupply if options for use of surplus electricity (e.g. green hydrogen production) do not become reality?	Yes.
Hydrogen and the electricity system	
8. How much of the Scottish Government ambitions for 5 GW of hydrogen production capacity by 2030, and 25 GW by 2045 should come from green hydrogen?	Green hydrogen (produced by splitting water into hydrogen and oxygen using renewable electricity) contribution should be maximized to ensure blue hydrogen production processes are minimized. There is strong scientific consensus that although, blue hydrogen produces no carbon dioxide (CO_2) emissions when burned or converted into electricity, the main component in producing blue hydrogen is methane (CH_4), the most potent greenhouse gas. While more work is needed to evaluate the warming impact of blue hydrogen production and associated CH_4 emissions, it is evident that those emissions matter for the climate. Therefore, we believe green hydrogen production it critical to ensure the realisation of Scotland's ambitions.

9. What are the key infrastructure barriers to building a hydrogen economy in Scotland and how should they be addressed?	The key infrastructure barriers to building a hydrogen economy in Scotland are: • Availability of suitable distribution networks to deliver hydrogen to end users (akin to the existing natural gas pipe distribution network. • The cost associated with the development and delivery of a sufficient network to deliver hydrogen to end users. • The scale of the task and the timescale associated with the delivery of this infrastructure. • The cost to end users, both in terms of purchasing for example hydrogen boilers but also the cost of hydrogen in comparison to existing traditional fuel sources. • The availability of a skilled workforce and sufficient volume of resource to deliver the infrastructure. In terms of how this should be addressed, this would be for industry and industry enablers to advise, and not local authorities.
Ofgem	
10. Ofgem are "working with government, industry and consumer groups to deliver a net-zero economy". What changes have recently been made to support the delivery of net-zero? What more could be done to support a regulatory regime that delivers decarbonised energy supplies affordably?	N/A
11. What are the most important issues for the UK Government's Review of Electricity Market Arrangements to address? What are the benefits of the current system, and the potential pitfalls of moving away from it? What are the implications for the Draft Energy Strategy of the Review?	N/A
Community Energy	
12. Are community and locally owned projects inhibited by the current electricity network?	Yes, as previously highlighted elsewhere in this document, at present there is limited spare capacity in some areas, the infrastructure is outdated and requires to be upgraded. The cost of these necessary upgrades are being passed on to the applicant/customer in the application/quotation process which impacts on any business case and the financial viability of the business case. The transition to Electric Vehicles and the decarbonisation of heat will significantly add to the electrical demand on the network and this will need to be addressed. The timescales for the application process to the grid is also prohibitive and puts pressure on the viability of business cases for renewable energy generation projects.

13. What are the key infrastructure barriers to Scottish Government community energy ambitions and how should they be addressed? Is it enough to "encourage" shared ownership models, or should a more formal mechanism be implemented?	The key infrastructure barriers to Scottish Government community energy ambitions are: • Awareness and knowledge of community energy potential for communities, and the opportunities for communities to get involved in community energy generation. • Availability of funding and resource to support implementation of projects. • The electricity infrastructure in the country is dated and in need of upgrading/replacement and this would be the responsibility of the electricity network owners/operators to plan these works taking cognisance of the Scottish Government's draft Energy Strategy and Just Transition Plan, including the community energy generation ambitions.