Energy Strategy Call for Evidence

Response Template

How to Respond

This template replicates the questions asked in the Call for Evidence found at: https://www.economy-ni.gov.uk/energy-strategy-call-for-evidence

It is recommended that you should read the full consultation document before completing your response. Please note that the text boxes used throughout this template can be expanded to accommodate your response – there is no character limit.

For further information on how we handle your personal data please read our Privacy Notice

Early responses are encouraged but all responses should arrive no later than **5pm on 20 March 2020.**

Please send your response to:

energystrategy@economy-ni.gov.uk

Or alternatively by post to:

Energy Strategy
Department for the Economy
Netherleigh
Massey Avenue
Belfast
BT4 2JP

Quote the reference "**Energy Strategy Call for Evidence 2019**"

1. General Information

1. **Name (required)**

Eddie McGoldrick

2. **Are you responding:**

   ☐ **as an individual (please complete 3 to 5 below)**

   X on behalf of an organisation / company (please complete 6 to 8 below)

If you are responding as an individual:

3. **E-mail address**

4. **Address**

5. **If you are responding as an individual, please read the Privacy Notice and tick the statement below as applicable.**

   X All responses will be published on the Department for the Economy website following completion of the Call for Evidence process. Please tick if you are content for your name to be published alongside your response.

If you are responding on behalf of an organisation / company:

6. **Organisation / Company**

PowerOn Technologies Limited t/a The Electric Storage Company

7. **Position within Company / Organisation**

[redacted]

8. **Contact details**

   a. **E-mail address**

[redacted]

   b. **Address**

[redacted]

2. Energy in Northern Ireland

Q1. What lessons can we learn from elsewhere in addressing energy within an overarching climate action framework?

Q2. What are the key considerations for decarbonising Northern Ireland's energy sector given existing linkages to other jurisdictions?

Q3. To what extent should Northern Ireland implement the key energy-related recommendations from the CCC 'Reducing Emissions in Northern Ireland' report?

Q4. Do you agree with the 30-year timeframe? If not, please state your preferred approach and reasons.

Q3. NI should fully support the recommendations from the CCC. In doing so the policies, structures and incentives should be put in place to promote the transition to a fully integrated energy model - integrating the energy market end to end, from cheap renewable energy through to people's homes, heating and transport, using innovative technologies.
Promoting and enabling a fully integrated model will allow NI to maximise its high renewable energy sources through all sectors, maximising the cleanest energy to reduce carbon usage but also the cheapest energy to significantly reduce fuel poverty.

3. The Energy Transition in Northern Ireland

Q5. What are the unique characteristics of Northern Ireland that need to be considered in a net zero carbon energy transition?

Q6. Is your organisation undertaking or planning to undertake projects to support the energy transition? If so, please provide further details.

Q5. Northern Ireland has 3 exceptional factors that need to be considered;

1. We have a significantly lower density of customers per km of network, raising the Cost to Serve and making maintenance of power quality standards at the point of usage more challenging.
2. We have a significantly lower industrial demand for energy in our economy as a whole
3. We have very high levels of non-synchronous variable renewable energy, both currently accommodated on our system, with much more potentially available yet, we have no zero-carbon energy production such as nuclear or large-scale hydro available on the island of Ireland.

Q6. Our organisation, The Electric Storage Company (TESC) has just started the GIRONA project which will directly support the energy transition.

This project will build the first smart grid in Northern Ireland. It will include 100 homes, 10 businesses and UU campus at Coleraine. It will develop power flow models and market trading models to establish what the potential impact will be when domestic and commercial energy users own, or have use of, devices that are capable of:

1. Flexing demand in terms of time and quantity;

2. Absorbing many sources of variable renewable energy (PV, wind, AD);

3. Providing support services to power networks at transmission and distribution level;

4. Determining the potential for revision of tariff elements such as Use of System Charges, Time of Use tariffs; and

5. Determining the implications (risks/opportunities) of moving away from the post privatisation linear model of generator, network operator, supplier to a Towards Net Zero-supporting recursive model of self generation, near real time network services demand & supply and self supply.

4. Consumers

Q7. How should we ensure that energy remains affordable for domestic consumers? What approach should be taken to eradicate fuel poverty?

Q8. What steps could be taken to improve the relative cost competitiveness of larger non-domestic consumers?

Q9. Is a strategic position of "enable and protect" the correct policy stance?

a) What policies or schemes are needed to enable active consumers?
b) What policies or schemes are needed to protect vulnerable consumers?

Q10. What types of advice and information are required by all consumers and what are the best mechanisms for facilitating this?

Q11. Are there examples of successful citizen energy projects in Northern Ireland and elsewhere that have delivered improved energy efficiency and/or clean energy to local communities?

Q12. What opportunities are there in both urban and rural areas for citizen energy communities in Northern Ireland? What role could government have in facilitating these?

Q13. What evidence can you provide that identifies the challenges and opportunities for NI energy consumers in decarbonising energy?

Q7. Ensuring energy remains affordable requires 3 factors to be addressed

1. Importation of fuel from external, volatile sources of an inherently tapering resource. Mitigation: Use locally available, renewable sources.
2. Deploy the predictability of very large numbers of customers demand to enable matching to local renewables supply. Mitigation: Use Big Data techniques to match supply vs. demand and eliminate wasted supply.
3. Exploit existing assets for as long as possible. This amortises costs over a longer period, making the use of the asset more affordable for customers. Mitigation: Use flexible demand 'behind the meter' assets for managing down peaks and eliminating troughs, reduce the 'wear and tear' on the network assets, reduce operating costs to repair failures and extend the life of the asset.

Eradication of fuel poverty requires

1. Reduction of fuel consumption by increasing the thermal efficiency of homes of those on lower incomes and explicitly rewarding energy efficiency

2. Reduction of energy cost for those who need to consume by adopting mitigations, including ability to capture energy at its cheapest (wholesale) and pass it through to those that need that cheap energy at the time they require it
3. Increase average incomes by creating better paid jobs in future trades and industries
4. Financial support to reduce the costs required in retro fitting homes, and regulation in place to ensure new homes including those for social housing have the technology and hardware to minimise energy costs and carbon usage long term

TESC was created to deliver points 2 and 3. We are collaborating with architects and builders on PassivHaus SoLow project to explore scope for point 1. Government support and policy would be required to achieve point 4.

We are happy to share data and details from our project and signpost DfE to housebuilding project.

We would also caution against the assertion in the Call for Evidence that ”NI compares well with other parts of the UK and the EU” on domestic electricity prices if that has been due to undue shifting of costs from domestic tariffs to industry tariffs. Our preliminary data analysis suggests that domestic customers could benefit from the tariff and market sophistication of industrial markets and therefore remove/reduce the need to “sculpt” tariffs to industry’ detriment.

Q12 The work of TESC to date, and with GIRONA to come, indicates the scope for rural communities and urban communities to benefit from deployment of the appropriate technologies and market mechanisms.

In both settings a socialised approach can bring opportunities. A metaphor for this would be the Credit Union movement in financial services. Acting as a community, those who have a little surplus can pool that resource, via a trusted and proven mechanism, and provide to those who have a short-term, small scale deficit. The mechanism can be fully transparent, costs can be low and the model highly replicable.

In rural communities the ‘long, stringy’ nature of the power network, due to low customer density, results in lower standards of power quality e.g. resilience measured in Customer Minutes Lost, voltage and frequency deviation outside standards. The appropriate technologies can actively enhance standards on all 3 factors. Government could incentivise customers to unite into such mechanisms with grants, accreditation of approved suppliers and encourage development of appropriate regulatory oversight.

Q13

TESC has 37 million rows of data over 2 years from across Northern Ireland that track consumption of electricity across several home types, generation from PV and wind renewables along with power network quality. DfE has supported the GIRONA project from the outset so we are keen to make such data sets available to further knowledge on how prosumer homes actually behave and impact the network.

5. Energy Efficiency

Q14. What, if any, energy efficiency target or targets should be set for Northern Ireland?

Q15. How should we define, measure and monitor energy efficiency to optimise its potential in our homes, business, economy and environment?

Q16. What are the most important policy levers for government to ensure zero carbon in:

a) New domestic and commercial buildings by 2050?;

b) Existing domestic and commercial buildings by 2050?

Q17. What should the future of energy efficiency support look like and who should be the key delivery bodies?

Q16. Financial support to homes in providing the upfront capital required to invest in the technology that provides long term payback on energy bills. Legislation changes in the construction of new homes (including social) which will maximise the value of the technology rather than having to overcome additional costs in retrofitting that results in longer payback to consumers. Financial benefits could be explored including grants, tax benefits for suppliers and/or consumers.

Q17. Government body with the power and ability to promote, enable and effectively drive the changes required to support energy transition in NI across various government bodies as well as in the public domain and energy market.

6. Heat

Q18. What is the appropriate pathway and timeline for the decarbonisation of heat between now and 2030, and subsequently to 2050?

Q19. What are the appropriate ways to measure the progress of decarbonising heat?

Q20. What are the most cost-effective and sustainable steps that government might take to accelerate the reduction of the carbon intensity of heating fuels?

Q21. Is decarbonisation of the gas grid a viable option and what evidence can be provided on both the speed and affordability of decarbonising the gas grid?

Q22. What evidence can you provide on the opportunities for district heating schemes in Northern Ireland and where should responsibility lie for facilitating these?

Q23. Can you provide any evidence or information on the opportunities for geothermal heat supply?

Q18. It is clearly important that the decarbonisation of heat forms a key part of the energy transition in NI given its current impact. However, it should be noted that given the potential scale of heat electrification in NI and its impact on the network, heat electrification is highly dependent on the implementation of other new energy efficient technologies (such as electric storage) to reduce load.

7. Power

Q24. What is the appropriate pathway for the decarbonisation of power from now to 2030, and subsequently to 2050?

Q25. What target for electricity consumption generated from renewable sources by 2030 is ambitious, achievable and affordable?

Q26. How can the new infrastructure necessary to meet a new renewable electricity target be delivered in a timely, affordable and acceptable way for consumers and society?

Q27. What innovations and solutions could contribute to meeting a new renewable electricity target?

Q28. What market incentives and support are necessary for investors to deliver the investment in renewable generation assets at a scale that will achieve a new renewable electricity target?

Q29. What steps need to be taken by Government to facilitate investment in offshore and marine renewables for NI?

Q26

TESC evidence to date is beginning to show that

1. there are substantial costs of waste from curtailment, constraint and sub-optimal utilisation of existing assets and potential further sub-optimisation of new, additional assets on the power network
2. the reduction/elimination of such costs creates economic value
3. such costs are capable of being eliminated/reduced by applying principles of technology flexibility and data analytics predictability
4. this also creates a virtuous circle whereby the matching of variable, renewable production spread throughout the network can be matched to predictable, flexible consumption and therefore free up capacity on the network, currently reserved for uncertainty, for more renewable production

This approach is timely because we have the capability ready for deployment by 2022. It is affordable because it takes out waste and reinforces efficient production and consumption. It is acceptable because it widens the base for involvement. Every community can get direct economic and environmental benefit that is tangible and verifiable.

Q27

The innovation is the application of existing NI fintech expertise to existing NI power engineering expertise and couple these to service delivery innovations; referred to as Energy Efficiency as a Service (EFaaS) in the Girona project. This would enable the Energy Revolution to really take off. For a revolution to be

successful it has to have widespread involvement of the population, any radical transformation limited to elites or sectoral interests is more of a coup d'etat and they rarely root and prosper in the long term.

Q28
Our experience of investors is that they are wary of significant investments where the market entrants are dependent upon government support, particularly in light of the RHI contracts being written down.

They are also wary of the regulators ability to keep the market transparent and fair in light of the dominant position of the DNO. They cite to us the closure of the grid connections gate in the past few years.

They also note that NIE Networks is owned by ESB Group which owns power stations, large wind farms, ESB Networks and Electric Ireland, the largest retailer on the island.

The mitigation of this risk would be enhancements of regulatory authority, competence and powers of scrutiny along with long term strategies from DfE.

8. Transport

Q30. What would be an appropriate pathway to decarbonised energy for transport to 2050?

Q31. What role should active travel have in the decarbonisation of the transport sector and what should government do to support this?

Q32. What energy infrastructure is needed to facilitate the uptake of electric vehicles in line with UK Government's 'Road to Zero' targets?

Q33. How will transport integrate with other energy uses (e.g. homes with solar generation, battery storage, EV charging) and what can government do to optimise the opportunities represented by this integration?

Q34. To what extent can alternative low carbon transport fuels contribute to decarbonisation of the transport sector?

Q35. Do you have any data/research to help inform and reduce the carbon intensity of our transport energy in order to achieve net zero carbon by 2050?

Q32

Customer will adopt practices that are easiest for them. A useful analogy here is water; when given a chance to have mains water in their homes people would never choose to use the village pump. Home charging needs to be like mains water in the home, universally available. The village pumps of petrol stations will wither but we need to test models for on-street charging. The GIRONA project has access through Innovate UK ERIS and Energy REV to the latest V2G and charging projects in UK. We would be keen to widen this discussion into a set of additional scope challenges.

Q33

TESC has data showing how a prosumer with solar, battery storage and EV charging was able to reduce the amount of power brought to his home and the amount of power exported from his home by 50% in the year after linking his PV, EV via one of our systems. Government has already supported the project GIRONA that has grown from this first prosumer; DfE, Invest NI, HMRC and Innovate UK supplied and continue to supply; stakeholder input, R&D Grants, Collaborative Network funding, Enterprise Investment Scheme, R&D Tax Credits and an Industrial Strategy Challenge Fund grant. Our experience has taught us that support can be got but it requires resilience, adaptability and patience. The bureaucratic processes are repetitious, overly wary of failure and require substantial cash up-front from the smallest and youngest of companies. The venture capital market in Northern Ireland is too small, too shallow and pre-occupied with low risk, profit generating, mature schemes. NI Government needs to review critically the venture capital schemes it funds to encourage/facilitate them to take on truly transformational energy businesses.

9. Other Issues:

a. Security of Supply

Q36. What specific risks to security of energy supply are likely to emerge as a result of our changing energy mix, and what actions can be taken to mitigate these?

Q37. What measures or indicators could be adopted or developed to monitor energy security of supply?

Q36. The electrification of transport and heat will put extra load and demand on the current energy network. Mitigation: implementation of flexible smart grid and in-home energy technology to smooth demand, and reduce requirement for expensive energy network investment.

b. The Role of Data

Q38. What is the most cost-effective method of capturing consumer energy usage data in electricity and natural gas (where meters are in place)? In heating oil (where there is no metering obligation)?

Q39. What concerns need to be addressed regarding data privacy, security and/or ownership?

Q40. What are your views on applying the key recommendations of the Energy Data Taskforce for NI?

Q41. What organisations or businesses do you see as having a key role in optimising the value of data? How will they do this?

c. Carbon Capture and Storage

Q42. What steps, if any, should NI policy-makers consider with regard to the development or implementation of CCUS in NI?

d. Energy and the Economy

Q43. What specific economic opportunities will arise from the decarbonisation of energy?

Q44. What skills are needed to realise the potential economic benefits of energy in the future?

Q45. What are your views on the future of overall energy demand in NI and how can we ensure that any potential demand growth aligns with our net zero carbon target?

e. Delivery Framework for an Energy Strategy

Q46. Do the existing division of responsibilities and powers across government enable the most effective approach to the overall aim of decarbonising energy? If not, what are your suggestions for improvement?

Q47. What are the opportunities for local government to contribute to the delivery of the net zero carbon target?

Q48. What are your views on how statutory duties and accompanying legislation and regulatory frameworks would need to change to facilitate the transition to net zero carbon by 2050?

Q49. Is there a need for a dedicated organisation to champion, lead and deliver sustainable energy interventions? If so, what should this look like?

10. Additional information

Q50. Is there anything else you would like to add in response to this Call for Evidence?