

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:

energystategy@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)

Malachy Campbell

2. Are you responding:

as an individual (please complete 3 to 5 below)

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.

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

Northern Ireland Environment Link

7. Position within Company / Organisation

Senior Policy Officer

8. Contact details

a. E-mail address

malachy@nienvironmentlink.org

b. Address

89 Loopland Drive, Belfast BT6 9DW

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.

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

Northern Ireland (NI) can learn from other administrations in the UK, Europe and further afield, that have decarbonised energy and reduced emissions to a much greater extent than NI has done so far.

While the UK has set a target for net zero carbon by 2050, Scotland for example has introduced legislation which sets a target date for net-zero emissions of all greenhouse gases by 2045. While it remains to be seen if NI could match that target, NI could at least learn lessons from the approach taken by other administrations. For example, in the 12 month period January 2019 to December 2019, 43.7% of total electricity consumption in Northern Ireland was generated from renewable sources located in Northern Ireland¹. This is great progress and means NI has passed its target for 40% of electricity to come from renewables by 2020. By comparison, Iceland has exploited its abundant natural energy resources to produce an almost entirely renewable electricity system, with 71% hydro-power and 29% geothermal and fossil fuels generating only 0.01% of electricity^{2, 3}. Similarly, roughly 95-98% of Costa Rica's electricity has come from renewable sources since 2014, while providing access to energy to almost all the population. However, despite the nearly 100% renewable electricity production, around 70% of the country's overall energy still comes from oil and gas, which is still widely used for transport, heating processes in the industry, as well as for activities like cooking⁴.

While aiming for 100% renewable energy may seem extremely ambitious, it can be done. In a 2009 article in *Scientific American*⁵, Stanford University researcher Mark Z. Jacobson and research scientist at the Institute of Transportation Studies at the University of California, Davis, Mark A Delucchi⁶ evaluated "*how 100 percent of the*

world's energy, for all purposes, could be supplied by wind, water and solar resources, by as early as 2030".

Jacobson and Delucchi stated that a world completely powered by renewable energy sources is possible, though the timescale depends on the policy decisions made, as

"With extremely aggressive policies, all existing fossil-fuel capacity could theoretically be retired and replaced in the same period" [of 20 to 30 years] but with more modest and likely policies full replacement may take 40 to 50 years".

Separately, Mark Jacobson has stated⁷

"Based on our findings, there are no technological or economic barriers to converting the entire world to clean, renewable energy sources"

"It is a question of whether we have the societal and political will."

Nearly 50 countries⁸ which make up the Climate Vulnerable Forum (CVF) and which are vulnerable to climate change have pledged to strive to meet 100% domestic renewable energy production as rapidly as possible while working to end energy poverty and protect water and food security and to achieve net carbon neutrality by the 2050s⁹. The members of the CVF are mostly developing nations and small island states. If the members of the CVF which would on average be less wealthy than Great Britain and Northern Ireland, can commit to generating 100% domestic energy production from renewables and to achieve net carbon neutrality by the 2050s, surely NI could also do that?

So, it seems a 100% renewable future is possible. As Mark Jacobson has said, the issue is the societal and political will. If NI is to reach net zero carbon by 2050, we should stop investing in hydrocarbons with immediate effect, otherwise we would lock ourselves in to a high carbon future. We need to start investing now in options that will take us on the low carbon path, and divest from fossil fuels. All new infrastructure investments should be subjected to a 'low carbon economy' appraisal to determine the impact on future carbon emissions and the cost implications of same. We also need greater investment in public transport and active travel and a more integrated approach to planning of settlements and services.

The International Energy Agency has made it clear that current energy consumption trends and rates are unsustainable, as illustrated by the following statement in the 2008 World Energy Outlook (p37 of full report and page 3 of summary report)¹⁰:

"The world's energy system is at a crossroads. Current global trends in energy supply and consumption are patently unsustainable – environmentally, economically and

socially. But that can – and must – be altered; there’s still time to change the road were on”

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

Probably the key consideration is the threat from climate change, which is driving the need to reduce greenhouse gas emission to net zero by 2050, or sooner. In turn, another key driver or consideration is the relevant UK and NI legislation and policy and the related targets established in order to deliver the net zero carbon target. This is also why NIEL believes that NI needs its own Climate Change Act. The priority should be the decarbonisation of NI’s energy supply, in so far as that should be the outcome which policies should aim to ensure is achieved. The integration of decarbonisation policies into other relevant legislation and policy will also be a key factor in the achievement of our net zero carbon targets. The integration of NI policy and legislation must for example include, but not be limited to, the current and any future version of the Programme for Government (PfG), economic development strategy, the Regional Development Strategy, any future Climate Change Act and other legislation and policies as appropriate. Decarbonising our energy system will require high levels of cross departmental co-operation and investment.

Another consideration is NI’s over reliance on imported fossil fuels which accounted for 96% of NI’s energy needs in 2010¹¹, though it was predicted that this could drop to between 68% and 41% in 2050¹². There is huge potential for renewable generation in NI, especially from wind power, but also wave power and bioenergy (biomass). If NI is to decarbonise it is essential that there is a significant reduction in the demand for energy. Reducing demand will not only make the achievement of any energy consumption/efficiency targets easier, but as outlined in response to question 43, will save money, previously estimated to be up to £12.3 billion annually across the UK.

Another distinctive characteristic of NI is that it is a small island and so the level of interconnection will also be a key consideration. The importance of the second North-South interconnector is explored in more detail in response to question 43 but interconnection, as well as the operation of the all island Integrated Single Energy Market (I-SEM) which provides an additional level of security for both NI and the Republic of Ireland (RoI) will be a key consideration for the NI energy market.

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

NI should, as a minimum, fully implement the key energy-related recommendations from the Climate Change Committee (CCC) 2019 Net Zero report, which recommended NI reduce its GHG emissions by 78-80% by 2050 compared to 1990

levels.¹³ NIEL believes NI could, and should, go further than this. The CCC also concluded¹⁴ “*that net-zero is necessary, feasible and cost-effective*” for the UK and NI should commit to a net zero carbon future, by 2050, matching the current UK target and NI should ensure it matches any amended UK target.

According to the CCC, Northern Ireland's contribution to the fifth UK carbon budget requires at least a 35% reduction in emissions from 1990s levels by 2030 and the CCC made recommendations as to how that 35% reduction could be achieved¹⁵. According to the CCC, NI is currently projected to achieve a reduction of 32% on 1990 levels, so it is clear that current policies are not enough. However, NI will have to go further than this (35% reduction) and the CCC outlined means by which NI could reduce emissions by 40% against the 1990 baseline by 2030, with a 45% reduction being possible. By comparison, the CCC predicted that by 2030 the UK will have reduced emissions by 61% by 2030 in line with the CCC's 2015 advice on the fifth carbon budget¹⁶, so NI should be able to surpass the recommended 35% reduction in GHG emissions by 2030.

There is also a need for better integration with other strategies including PfG, Economic Development Strategy, Sustainable Development Strategy and any Climate Change Act and/or related climate change policies that may be introduced.

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

It is good to have a long term strategic vision for energy policy and given the UK's net zero carbon target for 2050, then it is helpful if NI's energy policy is also planned out over a similar 30 year timescale. However, it is essential that there are appropriate milestones (similar to the Net Zero Carbon Emissions (Audit) Bill 2019-21 five year milestones and the Climate Change Act (2008) five year carbon budgets) and SMART targets established as part of this long term energy strategy. It is also essential that appropriate funding is allocated to ensure that the targets in the SEF will be achieved and therefore future strategies, as outlined in response to question 3, will need to also reflect and support the ambitions in the SEF.

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

One distinctive characteristic of NI, as discussed in the response to question 2, is that it is an administration on a small island with an integrated electricity market with the other administration on that island and so the level of interconnection is an important factor.

Another major consideration is that NI does not have its own climate change legislation. This is a major omission and needs to be rectified as a matter of urgency. Scotland and Wales are also included in the UK Climate Change Act of 2008 and the Net Zero Carbon target of 2050, yet Scotland and Wales also have their own national climate change legislation. Indeed, the targets in Scotland, in both the Scottish Climate Change Act 2008 and the updated Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, are better and/or higher than the respective UK targets. For example, the target in Scotland is for net zero emissions of all greenhouse gases by 2045 compared to the target of net zero emissions by 2050 for the UK as a whole.

NIEL believes there is a need for a NI specific climate change act with SMART targets and appropriate milestones for example, five-year carbon budgets, as in the (UK) Climate Change Act, to ensure NI contributes appropriately to the net zero by 2050 target. The overall targets should be guided by the latest science and least match the recommended target in the CCC report of 80% reductions in GHG emissions by 2050¹⁷. The rural nature of NI means NI has particular problems with public transport and the dispersed nature of our settlements, home heating and the emissions contributions from the agriculture sector, which according to the NI Environmental Statistics report 2019¹⁸, was responsible for 27% of NI's greenhouse gas (GHG) emissions, the largest contribution from any sector.

The consultation states on page 24 that “*Ultimately the energy transition should be focused on benefiting energy consumers – both domestic and non-domestic*”. However, NIEL would like more detail on the wording of this statement, as the nature of the benefit to customers and the time scale in which it is to be measured this consultation is proposing should be the focus for the transition, is unclear. As referred to in the response to question 2, ultimately, the energy transition should be focussed on the decarbonisation of the energy system, which will also benefit consumers in the

long term, but the nature of the benefit to customers that this consultation is proposing should be clarified. NIEL would of course wish to see that that consumers are protected and any increase in costs is kept to a minimum. However, it is likely that, initially at least, there may be an increase in costs in the early stages of the energy transition to a zero carbon supply, for example from increased levels of insulation and/or greater use of more sustainable building materials. However, in the long term the overall costs of renewable and low(er) or zero carbon energy sources are likely to decrease. It is important that the longer term focus is on the decarbonisation of the energy supply, with the understanding that there may be some additional costs along the way, rather than leaving open the possibility that decarbonisation options could be ruled out because of an ill-defined short-term focus on costs.

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

N/A

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

There needs to be a transition to low carbon energy in order to reduce the impact of price volatility of fossil fuels and this will require investment in renewable energy sources (RES) and clear strong legislation and policies that support the expansion of RES in order to reassure potential investors. There may be additional costs incurred by replacing fossil fuels used for other forms of energy (in particular heating and transport) especially in the early stages of this transition.

As regards fuel poverty, for a long time NI had the highest levels of fuel poverty in the UK. In 2011 the fuel poverty rate in NI was 42%, though by 2016 this had dropped to 22%¹⁹ though this drop is interpreted as being mainly down to the reduction in fuel prices during that time, as well as increased income levels and a reduction in energy use. Overall though, the age and quality of the housing stock in NI and the low levels of insulation remain an issue that need to be addressed. In order to further reduce levels of fuel poverty in the longer term the NI Executive needs to change and improve building regulations so that there are increased targets for energy efficiency of buildings. This is particularly important given that at the time of writing (March

2020) NI has no statutory target for reducing or eliminating fuel poverty, something that should be rectified as a matter of urgency. By comparison the fuel poverty rate in 2017 in England was 10.9%, in Scotland 24.9% and in Wales was 12%²⁰. In the Republic of Ireland in 2016 up to 26% of households were in fuel poverty²¹.

As the Whitty (2012) report²² said

“Reduction in fuel poverty and decarbonisation of energy supply need to be considered as being equally important policy objectives as cost and security of supply.”

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

No comment.

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?

The consultation states on page 30

“While the transition to a lower carbon energy supply comes with the risk of deepening fuel poverty, it also offers the opportunity to effectively end it once and for all.”

While there may be some increase in costs in the short to medium term, it is important to recognise that it is likely that in the long term decarbonising the energy supply should mean reduced costs for consumers. For example, as explored further in response to question 43, a HSBC evaluation²³ of the various economic stimuli packages from around the world highlighted the benefits of tackling climate change and although the benefits were not taken into account in the formal scoring the authors acknowledged that energy efficiency measures,

“also enhance energy security and help the less well off with their fuel bills”

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?

Drumlin Wind Energy Co-op²⁴ Drumlin owns and operates a number of community owned wind turbines across Northern Ireland. Northern Ireland Community Energy (NICE) is a local community energy co-operative²⁵ in Northern Ireland which offers the opportunity for communities to invest in renewable energy projects.

NI could learn from the approach taken in Germany, where citizen owned power generation has played an important role in the development of renewables for more than twenty years. In Germany, various legal forms of ownership have allowed citizens to own solar parks and wind turbines. The most common forms are energy co-operatives (Energiegenossenschaften) and the hybrid “GmbH & Co.KG”²⁶ (limited liability company & limited partnership). In 2018, Germany’s total installed renewable energy capacity (without pumped storage) was 100.3 gigawatts (GW), of which 31.5% was owned by private individuals and another 10.5% by farmers, bringing citizens energy ownership in the narrower sense to 42%, down from 46% in 2012²⁷.

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?

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

The most important thing to do is to reduce absolute energy consumption. The importance of energy efficiency was clearly highlighted by DETI who said that²⁸

“Reducing overall energy demand offers the potential for the most social, environmental and economic gains”

and that

“The Northern Ireland Authority for Utility Regulation (NIAUR) also recommends energy efficiency as the best opportunity to reduce emissions and energy bills in the near to medium term”

The nature of the system for supplying/transmitting energy is a key factor in terms of the potential to save energy as the centralized grid is highly inefficient, with two thirds of the energy generated wasted before it even reaches the consumer. There is then even further wastage at this point (of approximately 13%) resulting in a total cumulative loss of approximately 78%. Some work to upgrade and amend the nature of the grid will be required as part of a net zero carbon future. As the Whitty (2012) report²⁹ said

“A far more substantial programme on energy efficiency is needed in NI; that programme should be treated as a priority part of infrastructure strategy and consolidated in its funding and coordinated in its delivery”

Lord Whitty went on to say

“Decentralised energy should also be an arm of energy strategy and carbon savings and cost savings can be achieved with lower carbon technologies based on gas and electricity as well as renewables – in particular the provision of heat to both households and businesses”

As the EU has outlined³⁰ the transition towards a largely decentralised power system based on renewables will require

“a smarter and flexible system, building on consumers' involvement, increased interconnectivity, improved energy storage deployed on a large scale, demand side response and management through digitalisation”.

According to the Cabinet Office's Performance and Innovation Unit (PIU) 2002 report on energy efficiency, there is the potential to save approximately 30% of final energy demand across all sectors amounting to reduced costs to customers of £12,300,000,000

(£12.3 billion) annually. This overall saving of approximately 30% was composed of savings of approximately 21% of the energy used in the service sector and economic savings of £1.19 billion, 23% of the energy used in the industrial sector and £1.38 billion savings, 35% of the energy used in the transport sector and £4.7 billion savings and 37% of the energy used in the domestic sector and £5 billion savings³¹. NIEL believe that a target to reduce energy by at least 30% should be established, but that the Executive should set any target based upon the best available scientific evidence available at the time.

Investing in reducing demand and increasing the contribution from low carbon and renewable energy sources would also be more in line with the aim to develop a secure, sustainable and cost-efficient energy supply. Reducing demand, particularly from fossil fuel based energy, could also increase the percentage contribution from renewable energy, thereby facilitating the achievement of renewable energy targets. In fact, only a low carbon energy supply can be a truly sustainable supply, as fossil fuels are unsustainable, and not secure nor cost efficient in the medium to longer term.

It then follows that in order to properly address these aspects of energy supply the Executive must develop a low carbon economy. The Programme for Government Easy Read³² says that in relation to Outcome 2 the Executive plan to help the planet and people's health by "*Cutting down the amount of energy that is wasted*", yet this does objective not appear to be adequately reflected in the current draft Programme for Government but needs to be better reflected in the next PfG. As the Whitty (2012) report³³ said "*All forms of renewable, low carbon and decentralised energy should be encouraged but within a consistent and long term framework of incentive and support*"

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

Energy efficiency can be defined as the amount of energy required to perform a particular function or the usual or normal functions of an appliance and increasing the efficiency of appliances will make an important contribution to reducing overall energy demand.

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?**

Overall, the establishment of a NI specific Climate Change Act will probably be the most important policy lever to ensure zero carbon, as other things should then flow from that including the next version of the Programme for Government, the Economic Strategy, the Investment Strategy, the Regional Development Strategy and of other relevant strategies and policies. The next version of the Strategic Energy Framework will of course be fundamental to achieving net zero carbon by 2050, or whatever date is agreed for Northern Ireland. It is worth noting that the UK target is for net zero carbon,

which includes all other greenhouse gases emissions levels reaching net zero by 2050, so it is not just carbon based emissions that needs to be addressed.

As regards buildings specifically, NI building regulations will need to be greatly improved, to ensure NI can move to net zero carbon and the necessary review of building regulations must be based on the best available evidence, with the overall objective of achieving net zero carbon. This review of building regulations must happen as buildings, otherwise we will end up being locked into a higher carbon future than we should be if there are large numbers of buildings with relatively high energy demands. As such, reviewing building regulations, along with reviews of other sectors, must be done as a matter of urgency.

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

No comment.

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

No comment.

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

First of all it would be important to be able to quantify the amount of heat consumed in Northern Ireland, and the sources from which the heat comes.

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?

Probably the most important step is to reduce the demand for heating in the first place and raising the standards of the building regulations will be the foundation of reducing demand, as referred to in the response to Q16.

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?

NIEL believes that there is potential for decarbonisation of the gas grid, through the inclusion/injection of hydrogen and/or biogas into the existing gas network, but other organisations, such as B9 energy, would be better placed to quantify the potential for this.

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

NIEL believes that there is potential for district heating schemes in NI, particularly if there is an increase in the contribution from CHP stations but other organisations, such as B9 energy, would be better placed to quantify the potential for this.

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

There are two main types of geothermal power - shallow and deep. NIEL understands that an assessment of the potential for geothermal heating in NI has been done³⁴. This research concluded that there is widespread potential for geothermal heating in Northern Ireland with the Lower Permian Sandstones in the Larne-Antrim area having the highest potential. It has been estimated that 81 thermal MW of geothermal energy could have been developed in NI by 2020 and that would equate to approximately 31.5% of the renewable heat target of 1,300 thermal GW by 2020³⁵. NIEL understands that the Lyric Theatre in Belfast is in part powered by geothermal energy, so it is currently an option for NI. In an Assembly debate on 6th October 2014, a motion was passed³⁶ which called on the (then DETI) Minister

“to ensure that appropriate legislation and incentives are in place to support the development of this industry”.

Accounting for this it might be worth evaluating/reviewing the potential for geothermal energy in NI and NIEL would recommend the Department consult stakeholders, in particular the Geological Survey of Northern Ireland (GSNI) in relation to the potential for geothermal

heating in NI.

As was outlined in GT Energy's evidence to the ETI Committee in its inquiry into renewable energy in 2010³⁷, there was a proposal for a geothermal power station to be built in the Ballymena area, at an estimated cost of £30 million, though this was not progressed. The examples of France and in particular Paris which by 2010 had 34 geothermal energy plants and of Germany which had built 69 geothermal plants since 2001 were highlighted by GT Energy in that evidence session³⁸. To ensure that appropriate legislation and incentives are in place to support the development of this industry.

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?

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

It seems this section refers to the production and consumption of electricity. This being so, perhaps this section should be entitled “electricity”. Often commentators use the words energy or power when referring to electricity and this can lead to confusion. As such the SEF should ensure there is clarity.

Bodies like the CCC would be best placed to advise on this question. The CCC report on Net Zero³⁹ found that “*emissions from the UK's electricity system can be reduced to almost zero whilst meeting increased electricity demands from the transport and heat sectors, potentially doubling the size of today's electricity system*”

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

NIEL believes that a target of close to 95% of renewable electricity by 2030 would be a suitably ambitious target. This reflects the target the System Operator in NI (SONI) argued for in its 2020-25 strategy⁴⁰. SONI stated that it can currently operate the grid with up to 65% of renewable power and with a series of steps including some new infrastructure

“*By 2030, this must increase to 95%*”.

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?

NIEL believes the completion of the second North-South Interconnector is an essential step in facilitating the expansion of the provision of renewable electricity (from wind power in particular). According to Eirgrid⁴¹ the N-S Interconnector “*will help to improve the efficiency of the electricity system, reducing costs and ultimately saving money for the end user, the electricity customer.*”

Eirgrid also say that the N-S interconnector will also help in facilitating the connection of more renewable electricity generation to the grid and the import and export of any surplus renewable electricity. This would also help address the issue of the lack of a route to market for low cost intermittent renewables, which was one of the CCC’s policy priorities. According to a 2017 report by Grant Thornton for IBEC and CBI Northern Ireland⁴², the Economic and Social Research Institute (ESRI) estimated in 2014 that the interconnector will facilitate a 2.6% reduction in carbon emissions.

The second N-S interconnector is also expected to have a positive impact on electricity prices and create significant savings for consumers of around £25 million per year for the whole island, and the savings are likely to grow in time⁴³. The flip side of this is that every year of delay for the second N-S interconnector is likely to cost the all island economy, but NI in particular. In his evidence to the Northern Ireland Affairs Committee Robin McCormick General Manager SONI (System Operator NI)⁴⁴ said

“customers on the island are probably paying about an extra £40 million a year because the north-south interconnector is not there.”

There is a very strong case for the interconnector from business, as illustrated by the 2016 CBI / AECOM Infrastructure Survey which reported that 87% of Northern Ireland businesses surveyed identified the delivery of the second N-S interconnector as a as critical⁴⁵.

The second N-S interconnector would also enable greater levels of renewable energy to be dispatched to consumers and will support the continued reduction in carbon emissions across the island of Ireland. According to the CCC, in April 2018, following a five-month trial, EirGrid and SONI confirmed that up to 65% variable renewable energy can be handled on the all-island grid at any given time⁴⁶.

Any new renewable energy infrastructure needs to be delivered/built in a way that is sensitive to the environment and avoids damage to sensitive habitats and species such as peat bogs. This will likely require some amendments (i.e. improvements) to the planning system as there is a need for a strategic spatial approach for renewable energy.

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

It is difficult to say but providing greater funding for R&D and a more supportive legislative and policy framework could help develop innovations that could help reduce energy consumption, emissions and costs, as referred to below in response to Q28 and Q29.

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?

In response to question 28 and 29, NIEL believes that clear legislation for example in the form of a NI Climate Change Act and policy support for net zero carbon, for example in the form of the SEF, will help attract investment. This is supported by the findings of a 2011 report by the London School of Economics⁴⁷ which concluded that:

“credible long-term policy signals could leverage finance and unlock private investment in renewable energy, smart networks and communities, energy efficiency and low carbon vehicles on a great scale”.

The report argued that as regards investment in low-carbon technologies

“The issue is a lack of confidence to invest rather than a lack of liquidity.”

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?

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

Active travel is, in effect, an emissions free/carbon neutral form of travel and so should have a central role in the decarbonisation of the transport sector. Active travel also offers opportunities for increasing mental and physical wellbeing, reductions in pollution, improving air quality and economic benefits. For example, research for the UK Department of Transport found that cycling schemes can achieve more for less, with benefit-to-cost ratios in the in the range of 5:1 to 19:1, with some returns as high as 35.5:1. This research also found that a typical “cycling city” could be worth £377 million to the NHS in healthcare cost savings, in 2011 prices⁴⁸.

According to ‘The Value of the Cycling Sector to the British Economy: A Scoping Study’ (2018)⁴⁹, cycling’s economic contribution to the UK is £5.4 billion with the larger share of this, £4.1 billion, coming from wider impacts, particularly reductions in loss of life, and reduced pollution and congestion. Products associated with the cycling industry contribute £729 million while tourism attributable to cycling contributes, at least, a further £520 million. The researchers described these as minimum estimates of the scale of the cycling economy and argued that if benefits associated with avoidance of climate change damage, reduced morbidity, improved mental health as a result of physical activity, and improved children’s health were included, there would be an additional contribution of £3.0 billion. The research also found that cycling generates around 64,000 FTE jobs in the UK including jobs in tourism, sales and repair, cycle delivery, manufacturing, and cycle infrastructure. The report compared cycling to the steel industry which in 2016 had an economic output of £1.6 billion and supported 32,000 jobs.

According to Cycling UK⁵⁰, the average economic benefit-to-cost ratio of investing in cycling and walking schemes (active travel) is 13:1. Cycling UK also state that if cycle use in the UK were to increase from less than 2% of all journeys (2016 levels) to 10% by 2025 and 25% by 2050, the cumulative benefits would be worth £248bn between 2015 and 2050 for England - yielding annual benefits in 2050 worth £42bn in today’s money⁵¹. Also according to Cycling UK, cycle commuting employees take one less sick day each year than non-cyclists and save the UK economy almost £83m.

Denmark is one of the leading cycling countries in Europe and academics who studied the cost benefit analysis for cycling in the UK referred to Copenhagen⁵². A 2016 study⁵³ in the Capital Region of Denmark found that in terms of value for money per mile of infrastructure, cycling delivered a socioeconomic return of 19%. According to the Danish Ministry of Transport⁵⁴, in order for a project to be socio-economically profitable its internal rate of return should be compared to an internal rate of return of 4%. The internal rate of return on the cycle superhighways in the Danish Capital Region was 11%, compared to a 4% return on the Harbour Tunnel new eastern ring

road in Copenhagen⁵⁵. A cost-benefit analysis of cycling in Denmark found that when all factors are calculated, society gains DKK 4.79^a per kilometre cycled, primarily due to the large health benefit, whereas it costs society DKK 5.29 for every kilometre driven by car⁵⁶. Research by the Confederation of Danish Industry found that if 10% more kilometres are cycled there will be an annual socio-economic gain in Denmark of DKK 1.1 billion (€150 million)⁵⁷. Research for the City of Copenhagen in 2018 found that the societal level health benefits derived from walking make it the most profitable transport mode from a cost-benefit point of view, with a societal gain of DKK 7.4 per kilometre walked (€1)^{b58}.

In summary, it seems that accounting for the social, recreational, health and economic benefits it generates, there should be much greater investment in cycling, and active travel. NIEL would recommend that the transport budget for NI should be split 50/50 between investment in roads and public transport and active travel, as outlined in the response to question 35.

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

An appropriately expanded, reliable charging infrastructure needs to be put in place to reduce the 'range anxiety' for EV owners.

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?

Public transport links and active travel opportunities are especially important for the 22% of the population that did not have access to a car in 2016-18⁵⁹. There is an important role for the planning of new developments to ensure there is integration with public transport links and active travel options (including greenways and safe cyclepaths and walking paths), for example linking cycleways to bus and train stations with appropriate spaces for bicycle parking, and for investment in safe cycling and walking facilities.

As regards electric vehicles (EVs) it is important that, as outlined in response to question 32, an appropriately expanded, reliable charging infrastructure is put in place to reduce the 'range anxiety' for EV owners. Also the development of a Smart grid should help with the timing and cost of charging and EV and the opportunities that exist for EV's to act as short term storage for electricity that could be pumped back in to the grid at times of need.

^a Based on the exchange rates on 11th March 2020 DKK 4.79 DKK equates to £0.56 pounds sterling or €0.64 and DKK 5.29 equates to £0.62 pounds sterling or €0.71

^b Based on the exchange rates on 11th March 2020 DKK 7.4 equates to £0.87 pounds sterling or €0.99

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

Alternative low carbon transport fuels must be a part of the decarbonisation of the transport sector.

Electric vehicles (EVs) need to set targets and provide more recharging infrastructure. EVs can actually contribute to a decline in overall energy use as electricity is a much more efficient way to use energy. This is illustrated by the efficiency of EV's compared to vehicles with an internal combustion engine (ICE). Only 17 to 20% of the energy in gasoline is used to move a vehicle (the rest is wasted as heat), whereas 75 to 86% of the electricity delivered to an electric vehicle goes into motion⁶⁰.

According to the Inrix Global Traffic Scorecard 2019⁶¹, Belfast is still the second most congested city in the UK after London with drivers in Belfast spending 112 hours a year idling in congestion. This congestion also costs the city £117 million and each driver on average £874. According to Inrix, Belfast was also the second most congested city in the UK in 2018⁶² with this congestion costing Belfast drivers just over £141 million⁶³. According to Inrix in 2017 congestion cost Northern Ireland £1.1 billion⁶⁴ with a cost for Belfast motorists of £140 million.

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?

The societal and economic benefits of cycling and active travel were outlined in the response to question 31 above and are also relevant to this question. NI needs to greatly increase investment in low carbon travel options and reduce spending on roads. NIEL would like to see a significant shift in spending away from roads towards public transport and active travel so that the overall transport spend has at least a 50/50 split between roads and public transport, similar to the spending pattern in other UK administrations. The promotion of public transport and active travel is also crucial to delivering sustainable, low carbon solutions for connected infrastructure across Northern Ireland.

The private car continues to dominate day-to-day travel in Northern Ireland, with 70% of our journeys made by car and this is also reflected in the disproportionate spending on roads compared to public transport in Northern Ireland, as compared to England, Scotland and Wales. According to the National Audit Office⁶⁵, in 2017-18, 59% of the NI transport budget was spent on roads with 18% spent on railways, 11% on local public transport and 12% on other transport. The situation in England was almost the complete reverse of that in NI, with 31% of the transport budget spent on roads, 59% on railways and 8% on local public transport. In Scotland 42% of the transport budget

was spent on roads and 47% on public transport (39% on railways and 8% on local public transport). In Wales 45% of the transport budget was spent on roads and 51% on public transport (46% on railways and 5% on local public transport). NIEL would like to see a significant shift in spending so that so that the overall transport spend has at least a 50/50 split between roads and public transport, similar to the spending pattern in other UK administrations. The promotion of public transport and active travel (as outlined in the response to question 31) is also crucial to delivering sustainable, low carbon solutions for connected infrastructure across Northern Ireland and can create significant economic, social and environmental benefits, and should receive greater support from the NI Executive.

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 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?

Given the closure of Kilroot's 476 MW coal units (Units ST1 and ST2) expected in 2025, there is a risk of a shortage of supply unless the demand for electricity is reduced and the infrastructure is improved, most notably the second North–South Interconnector.

According to Eirgrid's 2019-2028 Capacity Statement⁶⁶, the current surplus of plant across the island will be eroded by growth in demand and expected plant closures, illustrated by the statement that

"At a Median demand level there is not adequate capacity to meet demand from 2026 on an all-island basis once Moneypoint closes at the end of 2025."

The importance of the second N-S interconnector was highlighted Eirgrid's All Island Generation Capacity Statement 2019-2028⁶⁷. It said that as regards Ireland

"By 2026, a deficit of capacity is forecast in all scenarios except the Low Demand forecast."

It goes on to say that if the second North-South interconnector is not completed by 2023 and Kilroot's coal units close as anticipated, *"Northern Ireland goes into deficit in the Median and High scenario in 2025"*

SONI monitor the security of supply on a short term and long term basis and so NIEL would recommend that the Department consult extensively with the relevant stakeholders in the energy supply sector, including the utility regulator and the Carbon Trust.

These deficits could be significant with deficits of up to 350 MW by 2026. According to Eirgrid there was 3704 MW capacity at the end of 2018⁶⁸

Demand management is of course an important aspect of these projections. EirGrid's

2017 report 'Tomorrow's Energy Scenarios', included scenarios in which the Total Electricity Requirement (TER) increased by between 22% and 53% to 2030⁶⁹. Clearly the lower the demand the more likely it will be that there will be an adequate level of provision of electricity, though ideally given the potential for reducing demand, as outlined in the UK Government Cabinet Office's Performance and Innovation Unit (PIU) 2002 report on energy efficiency, there is the potential to save approximately 30% of final energy demand and ideally the target should be to reduce demand in absolute terms rather than have a lower level of an increase in demand. At the same time this is tempered by the likelihood of an increase in demand in electricity for heating and transportation, particularly in electric vehicles.

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

NIEL understands this is already being done as it is one of SONI's responsibilities. The availability of reliable data is essential for the long term planning that will be needed to ensure security of supply. There is potential for more accurate measurement and ambitious targets for reducing demand and for energy efficiency to be established and monitored.

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?

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)?

Smart meters could help capture more detailed electricity consumption data, but existing meters should be able to provide sufficient data on consumption.

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

NIEL is not best placed to answer this but would expect all relevant data safeguards to be met.

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

No comment.

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

No comment.

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?

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

The potential role for CCUS, particularly in relation to the availability of suitable sites and the economic viability is unclear at this moment and NIEL does not have a position on CCUS. However, NIEL believes the priority should be for a significant reduction in carbon emissions, rather than relying on potential technological fixes such as CCUS.

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?

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

- Green growth

According to the UNEP Green Economy Report (GER)⁷⁰ investing just 2% of GDP in a green transformation of (ten) key sectors can kick start a transition towards a low carbon, resource-efficient economy and

“Greening the economy not only generates growth and in particular gains in natural capital, but it also produces a higher growth in GDP and GDP per capita. Under the GER modelling exercise, a green investment scenario achieves higher economic growth rates than a business as usual scenario within 5-10 years”

Given that the two principal strands of tackling climate change will be reducing our energy demand in absolute terms and decreasing the amount of energy used and generated from fossil fuels while increasing the amount of energy used and generated from renewable sources, there are likely to be very significant economic advantages from this move to a low/zero carbon future - it will be a win-win situation.

A HSBC evaluation⁷¹ of the various economic stimuli packages from around the world highlighted the benefits of tackling climate change and noted that amongst the arguments for a low carbon stimulus,

“The low-carbon economy can also be a job rich economy at a time of soaring unemployment, particularly through enhancing building efficiency, either via retrofit or new construction, and improving mass transit.”

The New Economics Foundation have advocated the need for a green new deal to deal with what they referred to as the ‘triple crunch’ of a credit fuelled financial crisis, accelerating climate change and soaring energy prices underpinned by an encroaching peak in oil production. Similarly, an evaluation of the case for a ‘green’ stimulus co-authored by Nicholas Stern⁷² concluded,

“A ‘green’ fiscal stimulus can provide an effective boost to the economy, increasing labour demand in a timely fashion, while at the same time building the foundations for sound, sustainable and strong growth in the future”

The report also concludes that

“this is the right time to be spending on measures to promote energy efficiency and low-carbon technologies, given the urgency of the case for reducing greenhouse gas emissions”

It would be fair to say that the case for reducing greenhouse gas emissions has become even more urgent since 2009 when this report was first published.

This report also evaluated and ranked 23 specific proposals in terms of economic benefit and climate benefit and energy efficiency measures were consistently the top performers across all sectors. Though the benefits were not taken into account in the formal scoring the authors acknowledged that energy efficiency measures,

“also enhance energy security and help the less well off with their fuel bills”

The volatility in oil price also has a major impact. In July 2008 oil reached an all time high of \$147 a barrel before dropping back to under \$40 a barrel by the end of the year. The impact of this volatility was highlighted by the Economist Dr. Shimon Awerbuch of the University of Sussex, UK who said⁷³ *“Oil price spikes between 2000 and 2005 cost the EU EUR 400-700 billion, which is more than the estimated total investment needed to meet the EU target of 20 per cent renewables by 2020”*

In most parts of the world today, renewables are the lowest-cost source of new power generation. As costs for solar and wind technologies continue falling, this will become the case in even more countries⁷⁴. An analysis by Energy Innovation has found that in America, from March 2019, the cost of local wind and solar could replace approximately 74% of the U.S. coal fleet at an immediate savings to customers. By 2025, this number grows to 86 percent of the coal fleet⁷⁵. The CCC conclude that a net-zero GHG target across the EU, also report economic impacts of a percentage point or two of GDP, and possibly a small overall benefit to GDP.⁷⁶

- Job creation

The Carbon Trust⁷⁷ estimated there could be between 8,470 and 33,124 jobs from renewable energy created in NI by 2020 generating between £253 and

£989 million GVA.

According to the Office for National Statistics, (ONS), in the UK in 2017, an estimated £79.6 billion turnover was generated directly and indirectly by businesses active in the low carbon and renewable energy (LCRE) economy, compared with £73.6 billion turnover in 2016 and £71.8 billion turnover in 2015 and LCRE businesses accounted for a total of 396,200 full-time equivalent (FTE) employees, compared with 390,600 in 2016 and 377,300 in 2015⁷⁸. Also according to the ONS report, exports of goods and services by businesses active in the UK low carbon and renewable energy (LCRE) economy were an estimated £5.0 billion in 2017, compared with £3.8 billion in 2016⁷⁹.

A report by the National Grid⁸⁰ on net zero found that the UK will need to recruit over 400,000 jobs to build the net zero energy workforce and reach net zero by 2050, of which 13,700 jobs will be needed in Northern Ireland.

According to the department for the Economy, in the three year period 2014-2016 in Northern Ireland, an estimated annual average of around £1 billion in turnover and 5,500 full time equivalent (FTE) direct jobs and 6,000 FTE indirect jobs were generated by businesses active in the Low Carbon and Renewable Energy (LCRE) economy in each of the years 2014 to 2016⁸¹.

- Saving money by reducing demand

According to the Cabinet Office's Performance and Innovation Unit (PIU) 2002 report on energy efficiency, there is the potential to save approximately 30% of final energy demand across all sectors amounting to reduced costs to customers of £12,300,000,000 (£12.3 billion) annually. This overall saving of approximately 30% was composed of savings of approximately 21% of the energy used in the service sector and economic savings of £1.19 billion, 23% of the energy used in the industrial sector and £1.38 billion savings, 35% of the energy used in the transport sector and £4.7 billion savings and 37% of the energy used in the domestic sector and £5 billion savings⁸².

According to the National Infrastructure Committee⁸³ smart power – principally built around three innovations, Interconnection, Storage, and Demand Flexibility – could save consumers up to £8 billion a year by 2030, help the UK meet its 2050 carbon targets, and secure the UK's energy supply for generations.

According to The Carbon Trust⁸⁴, "*Energy storage could save £2.4 billion a year system wide by 2030; if regulatory hurdles are overcome this could rise to £7 billion a year.*" £2 billion of this comes from the deployment of storage, with a further £5 billion primarily from improved use of existing generation assets and

optimised and reduced investment in new low carbon generation assets.

- Additional benefits

It could also be argued that the change to a low carbon energy supply offers many positive opportunities, beyond the creation of job opportunities, better and more stable pricing regimes (rather than the current very volatile regime based on oil production) the reduction in costs for administrations and consumers, principally through improvements in health from reductions in air pollution. There is evidence that air pollution has detrimental effects on health at all ages⁸⁵, there is accumulating evidence that the consequences of early life exposure may be more important than that occurring at other stages in life. In amongst all the health implications of air pollution, research in 2018 found evidence of a positive association between residential levels of air pollution across London and being diagnosed with dementia, which is unexplained by known confounding factors. The research found people over 50 in areas with the highest levels of nitrogen oxide in the air showed a 40% greater risk of developing dementia than those with the least NOx pollution⁸⁶.

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

NIEL understand that Invest NI had previously done some important work with local third level education establishments to promote opportunities for students taking STEM subjects including apprenticeships. While, as NIEL understands it previous policy decisions by the UK Government in relation to renewable energy and the removal of policy and financial support for renewables, in particular wind power, had a major (negative) impact on the employment opportunities for students and so recognises that the decisions of the UK Government will be key, NIEL would like to see the previous linkages with third level education developed by Invest NI re-established.

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?

It is essential that, as far as possible, demand is reduced, especially demand for energy derived from fossil fuel sources, though NIEL recognises that the electrification of heating and transport is likely to increase demand for electricity in the longer term. See response to section 5 on energy efficiency for more detail.

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?

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?

Absolutely not. As the consultation paper outlines on page 17, currently six government departments have responsibility for certain aspects of energy use. This splintering of responsibility is likely to present obstacles and cause delay to the rapid shift away from a fossil fuel based energy system to a decarbonised RES energy system. Consequently, NIEL believes the structures of government with responsibility for energy need to be reviewed. As outlined in response to question 5, above, the establishment of an integrated sustainable energy agency for Northern Ireland is one option that could help with the transition to net zero carbon. This was supported by the (former) ETI Committee "Report on the Energy Inquiry" (recommendation 38) published in March 2002 which said

"The Committee recommends the consideration of the establishment of a Renewable Energy agency."

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

Local authorities should set targets for their own operations to be zero net carbon by 2050. There are a number of bodies that could advise local councils on how to reduce their environmental, including on how to decarbonise their operations. Including Sustainable NI, who can advise councils how to make their operations more sustainable and Climate NI who can advise on how a council can adapt to climate change. Fermanagh and Omagh District Council has for example, bought

electric vehicles for council staff to use. Reducing energy demand and/or using renewable energy as well as reducing miles travelled for council business through the use of video conferencing are other simple options for reducing the ecological footprint of a council's operations. Taking actions to reduce the energy consumed by a council would be in line with the statutory duty in the Northern Ireland (Miscellaneous Provisions) Act 2006 Section 25⁸⁷, that

"a public authority must, in exercising its functions, act in a way it considers best calculated to contribute to the achievement of sustainable development in Northern Ireland ..."

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?

Above all, NI needs to have a Climate Change Act to provide the legislative duty to reach net zero carbon by at least 2050, matching the UK target. As previously referred to, the integration of the SEF and other legislative and policy instruments including the PfG and Economic Strategy must ensure integration and co-ordination of policy across government, so that NI is not locked into high carbon choices, for example by building inefficient buildings, or pursuing fracking in Northern Ireland, in the same way that the recent judgement of the UK Supreme Court ruled that expanding Heathrow airport by creating a third runway was not compatible with the UK's responsibilities under the Paris agreement⁸⁸.

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

This would be a good idea, as referred to in the response to question 5 and 46 regarding the establishment of an integrated sustainable energy agency for Northern Ireland.

10. Additional information

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

Not at the moment.

-
- ¹ Electricity consumption and renewable generation in Northern Ireland:Year ending December 2019. <https://www.economy-ni.gov.uk/sites/default/files/publications/economy/Electricity-Consumption-Renewable-Generation-NI-issue-14.pdf>
- ² Icelandic National Energy Agency, Data Repository; Electricity Production for 2014, <https://nea.is/the-national-energy-authority/energy-statistics/generation-of-electricity/>
- ³ <https://icelandmag.is/article/does-iceland-really-produce-all-its-electricity-renewables>
- ⁴ <https://www.worldfuturecouncil.org/100-renewable-energy-costa-rica/>
- ⁵ Scientific American A Plan for a Sustainable Future. How to get all energy from wind, water and solar power by 2030. <https://web.stanford.edu/group/efmh/jacobson/Articles/I/sad1109Jaco5p.indd.pdf>
- ⁶ <https://news.stanford.edu/news/2011/january/jacobson-world-energy-012611.html>
- ⁷ <https://news.stanford.edu/news/2011/january/jacobson-world-energy-012611.html>
- ⁸ The 48 members of Climate Vulnerable Forum who have agreed to the decision are: Afghanistan, Haïti, Philippines, Bangladesh, Honduras, Rwanda, Barbados, Kenya, Saint Lucia, Bhutan, Kiribati, Senegal, Burkina Faso, Madagascar, South Sudan, Cambodia, Malawi, Sri Lanka, Comoros, Maldives, Sudan, Costa Rica, Marshall Islands, Tanzania, Democratic Republic of the Congo, Mongolia, Timor-Leste, Dominican Republic, Morocco, Tunisia, Ethiopia, Nepal, Tuvalu, Fiji, Niger, Vanuatu, Ghana, Palau, Viet Nam, Grenada, Papua New Guinea, Yemen, Guatemala, Colombia, The Gambia, Lebanon, Palestine and Samoa
- ⁹ <https://thecvf.org/marrakech-vision/>
- ¹⁰ IEA World Energy review 2008 http://81.47.175.201/transvisions/documents/new/WEO2008_es_english.pdf
- ¹¹ Envisioning the Future Considering Energy in Northern Ireland to 2050 Ricardo-AEA 2013 <https://www.economy-ni.gov.uk/sites/default/files/publications/deti/2050%20vision%20report.pdf>
- ¹² Ibid
- ¹³ Committee on Climate Change Net Zero The UK's contribution to stopping global warming p172 <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>
- ¹⁴ Ibid
- ¹⁵ Committee on Climate Change Reducing emissions in Northern Ireland February 2019 (p12) <https://www.theccc.org.uk/publication/reducing-emissions-in-northern-ireland/>
- ¹⁶ Ibid
- ¹⁷ Committee on Climate Change Net Zero The UK's contribution to stopping global warming <https://www.theccc.org.uk/publication/net-zero-technical-report/>
- ¹⁸ NI Environmental Statistics report 2019 DAERA https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ni-environmental-statistics-report-2019_0.pdf
- ¹⁹ Housing Executive House Condition Survey 2016 <https://www.nihe.gov.uk/Documents/Research/HCS-2016-Main-Reports/HCS-2016-Infographic-Summary.aspx>
- ²⁰ Department for Business, Energy and Industrial Strategy Annual Fuel Poverty Statistics in England, 2019 (2017 data) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/829006/Annual_Fuel_Poverty_Statistics_Report_2019_2017_data_.pdf
- ²¹ <https://www.seai.ie/publications/Energy-in-the-Residential-Sector-2018-Final.pdf>
- ²² http://www.consumercouncil.org.uk/filestore/documents/Lord_Whitty_Report.pdf
- ²³ HSBC A Climate for Recovery Climate Change Global February 2009 https://www.globaldashboard.org/wp-content/uploads/2009/HSBC_Green_New_Deal.pdf
- ²⁴ Drumlin owns and operates 6 x 250kW turbines after raising £3.7 million in 2 successful share offers. In 2012 the co-operative raised £2.7m to build 4 turbines across Northern Ireland and in 2014 raised a further £1.2m to construct two more community owned and managed turbines
- ²⁵ <http://www.nicommunityenergy.org/>
- ²⁶ <https://www.gtai.de/gtai-en/invest/investment-guide/establishing-a-company/company-forms/gmbh-and-co-kg>
- ²⁷ <https://www.cleanenergywire.org/factsheets/citizens-participation-energiewende>
- ²⁸ DETI "Delivering Northern Ireland's 1% Energy Efficiency Target An Overview
- ²⁹ http://www.consumercouncil.org.uk/filestore/documents/Lord_Whitty_Report.pdf
- ³⁰ <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52018DC0773&from=EN>
- ³¹ Policy and Innovation Unit <http://www.gci.org.uk/Documents/TheEnergyReview.pdf>
- ³² <https://www.northernireland.gov.uk/sites/default/files/consultations/newnigov/pfg-consultation-document-easy-read-lowres.pdf>

-
- ³³ http://www.consumercouncil.org.uk/filestore/documents/Lord_Whitty_Report.pdf
- ³⁴ The Geothermal Potential of Northern Ireland Pasquali, R., O'Neill N., Reay D and Waugh T. Proceedings World Geothermal Congress 2010 Bali, Indonesia, 25-29 April 2010 <https://www.geothermal-energy.org/pdf/IGAstandard/WGC/2010/1625.pdf>
- ³⁵ <https://www.theyworkforyou.com/ni/?id=2014-10-06.7.13>
- ³⁶ <https://www.theyworkforyou.com/ni/?id=2014-10-06.7.13>
- ³⁷ <http://www.niassembly.gov.uk/assembly-business/official-report/committee-minutes-of-evidence/session-2010-2011/october-2010/renewable-energy-inquiry-action-renewables-and-gt-energy/>
- ³⁸ Ibid
- ³⁹ <file:///C:/Users/support/Downloads/Net-Zero-Technical-report-CCC.pdf>
- ⁴⁰ SONI 2020-25 strategy <http://www.soni.ltd.uk/about/strategy-2025/>
- ⁴¹ <http://www.eirgridgroup.com/the-grid/projects/north-south/the-project/>
- ⁴² Grant Thornton (2017) Strengthening the all island electricity network by 2020 <https://www.grantthornton.ie/globalassets/1.-member-firms/ireland/insights/publications/grant-thornton---north-south-interconnector.pdf>
- ⁴³ Ibid
- ⁴⁴ Northern Ireland Affairs Committee Oral evidence The electricity sector in Northern Ireland HC 51 6 September 2016 Robin McCormick General manager Q333 <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/northern-ireland-affairs-committee/the-electricity-sector-in-northern-ireland/oral/37478.html>
- ⁴⁵ 2016 CBI/AECOM Infrastructure Survey <https://urbis.europarl.europa.eu/urbis/sites/default/files/generated/document/en/Thinking%20Globally%20Delivering%20Locally.pdf>
- ⁴⁶ Committee on Climate Change Reducing emissions in Northern Ireland February 2019 (p12) <https://www.theccc.org.uk/publication/reducing-emissions-in-northern-ireland/>
- ⁴⁷ Romani M, Stern N and Zenghelis, D 2011. The basic economics of low-carbon growth in the UK. Grantham Research Institute on Climate Change and the Environment and the Centre for Climate Change Economics and Policy London School of Economics https://www.researchgate.net/profile/Dimitri_Zenghelis/publication/265189940_The_basic_economics_of_low-carbon_growth_in_the_UK/links/54c62d3e0cf2911c7a571e52.pdf
- ⁴⁸ The value of cycling https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/509587/value-of-cycling.pdf
- ⁴⁹ Newson C and Sloman L The Value of the Cycling Sector to the British Economy: A Scoping Study 2018 <https://bicycleassoc.wpengine.com/wp-content/uploads/2019/03/The-Value-of-the-Cycling-Sector-to-the-British-Economy-FINAL.pdf>
- ⁵⁰ <https://www.cyclinguk.org/campaigning/views-and-briefings/cycling-and-economy>
- ⁵¹ Ibid
- ⁵² Ibid
- ⁵³ <https://cyclingindustry.news/danish-study-outlines-economic-savings-made-by-building-a-safe-cycling-network/>
- ⁵⁴ <https://cyclingsolutions.info/cost-benefit-of-cycling-infrastructure/>
- ⁵⁵ <https://cyclingsolutions.info/cost-benefit-of-cycling-infrastructure/>
- ⁵⁶ <https://cyclingsolutions.info/cost-benefit-of-cycling-infrastructure/>
- ⁵⁷ <https://cyclingsolutions.info/cost-benefit-of-cycling-infrastructure/>
- ⁵⁸ <https://cyclingsolutions.info/cost-benefit-of-cycling-infrastructure/>
- ⁵⁹ <https://www.infrastructure-ni.gov.uk/system/files/publications/infrastructure/tsni-in-depth-report-2016-2018.pdf>
- ⁶⁰ <https://web.stanford.edu/group/efmh/jacobson/Articles/I/sad1109Jaco5p.indd.pdf>
- ⁶¹ <https://inrix.com/press-releases/2019-traffic-scorecard-uk/>
- ⁶² <https://www.belfasttelegraph.co.uk/news/northern-ireland/belfast-drivers-spent-190-hours-stuck-in-traffic-last-year-second-worst-in-uk-37808917.html>
- ⁶³ <https://www.pressreader.com/uk/belfast-telegraph/20190213/281500752512079>
- ⁶⁴ <https://www.belfasttelegraph.co.uk/news/northern-ireland/traffic-congestion-on-northern-ireland-roads-cost-economy-over-1-bn-in-2017-36570059.html>

-
- ⁶⁵ National Audit Office Investigation into devolved funding <https://www.nao.org.uk/wp-content/uploads/2019/02/Investigation-into-devolved-funding.pdf>
- ⁶⁶ Eirgrid All-Island generation capacity Statement 2019-2028 <http://www.eirgridgroup.com/site-files/library/EirGrid/EirGrid-Group-All-Island-Generation-Capacity-Statement-2019-2028.pdf>
- ⁶⁷ Ibid
- ⁶⁸ Ibid
- ⁶⁹ Eirgrid Tomorrow's Energy Scenarios 2017 Planning our energy future <http://www.eirgridgroup.com/site-files/library/EirGrid/EirGrid-Tomorrows-Energy-Scenarios-Report-2017.pdf>
- ⁷⁰ <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=659&ArticleID=6902&l=en>
- ⁷¹ HSBC A Climate for Recovery Climate Change Global February 2009 https://www.globaldashboard.org/wp-content/uploads/2009/HSBC_Green_New_Deal.pdf
- ⁷² A. Bowen, S. Frankhauser, N. Stern and D Zenghelis An outline of the case for a 'green' stimulus Policy Brief February 2009, London School of Economics http://eprints.lse.ac.uk/24345/1/An_outline_of_the_case_for_a_green_stimulus.pdf
- ⁷³ http://www.eufores.org/uploads/media/Awerbuch-edinburgh_risk-portfolios-security-distver-Oct-20051.pdf (accessed 6th January 2020)
- ⁷⁴ IRENA Renewable power generation costs in 2018 https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/May/IRENA_Renewable-Power-Generations-Costs-in-2018.pdf
- ⁷⁵ The coal cost crossover: economic viability of existing coal compared to new local wind and solar resources https://energyinnovation.org/wp-content/uploads/2019/03/Coal-Cost-Crossover_Energy-Innovation_VCE_FINAL.pdf
- ⁷⁶ Committee on Climate Change Net Zero The UK's contribution to stopping global warming p28 <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>
- ⁷⁷ NI Renewable Energy Supply Chain 2008, Carbon Trust report by Roger Tym and Partners available in Carbon Trust NI submission to Environment Committee Inquiry into climate change February 2009, <http://archive.niassembly.gov.uk/environment/2007mandate/submissions/CarbonTrust.pdf>
- ⁷⁸ ONS Low Carbon and renewable energy economy, UK 2017 <https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/finalestimates/2017#how-do-we-measure-the-low-carbon-economy>
- ⁷⁹ Ibid
- ⁸⁰ National Grid Building the net zero energy workforce January 2020 <https://www.nationalgrid.com/document/126256/download>
- ⁸¹ Energy in Northern Ireland 2018 <https://www.economy-ni.gov.uk/sites/default/files/publications/economy/energy-northern-ireland-2018.pdf>
- ⁸² Policy and Innovation Unit <http://www.gci.org.uk/Documents/TheEnergyReview.pdf>
- ⁸³ National Infrastructure Commission report Smart Power https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/505218/IC_Energy_Report_web.pdf
- ⁸⁴ <https://www.carbontrust.com/media/672486/energy-storage-report.pdf>
- ⁸⁵ Landrigan PJ , Fuller R , Acosta NJR , *et al* . The lancet commission on pollution and health. Lancet 2018;**391**. doi:10.1016/S0140-6736(17)32345-0
- ⁸⁶ Are noise and air pollution related to the incidence of dementia? A cohort study in London, England Carey I.M., Anderson, H.R., Atkinson, R.W., Beevers, S.D., Cook D.G., Strachan D.P., Dajanak D., Gulliver J., Kelly F.J., 2018 BMJ Open 2018 <https://bmjopen.bmj.com/content/bmjopen/8/9/e022404.full.pdf>
- ⁸⁷ <http://www.legislation.gov.uk/ukpga/2006/33/section/25>
- ⁸⁸ <https://www.judiciary.uk/wp-content/uploads/2020/02/Heathrow-summary-of-judgments-26-February-2020-online-version.pdf>