



Northern Ireland
Assembly

Committee for the Economy

Energy Strategy Micro Inquiry

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Ordered by the Committee for the Economy to be printed 23 November 2020.

Report: NIA 51/17-22 Committee for the Economy.

This report is embargoed until 00:01am on Monday 23rd November 2020

Contents

Powers and Membership	3
Introduction	5
Summary of Responses	6
Annexe A	37

Powers and Membership

Powers

The Committee for the Economy is a Statutory Departmental Committee established in accordance with paragraphs 8 and 9 of Strand One of the Belfast Agreement and under Assembly Standing Order No 48. The Committee has a scrutiny, policy development and consultation role with respect to the Department for the Economy and has a role in the initiation of legislation. The Committee has 9 members, including a Chairperson and Deputy Chairperson, and a quorum of 5.

The Committee has power to:

- consider and advise on Departmental budgets and Annual Plans in the context of the overall budget allocation;
- approve relevant secondary legislation and take the Committee Stage of relevant primary legislation;
- call for persons and papers;
- initiate enquiries and make reports; and
- consider and advise on matters brought to the Committee by the Minister for the Economy.

Membership

The Committee has 9 members, including a Chairperson and Deputy Chairperson, and a quorum of five members. The membership of the Committee is as follows

- Dr Caoímhe Archibald MLA (Chairperson)
- Ms Sinéad McLaughlin MLA (Deputy Chairperson)
- Mr Stewart Dickson MLA
- Mr Gordon Dunne MBE MLA
- Mr Gary Middleton MLA
- Mr John O'Dowd MLA

- Mr Christopher Stalford MLA
- Mr John Stewart MLA
- Ms Claire Sugden MLA

Introduction

Under Standing Order 46(7), the Committee has the power to make a special report on any *“matters which the committee may think fit to bring to the notice of the Assembly”*.

The Committee for the Economy recently carried out an Micro Inquiry to seek views from stakeholders on what they wanted to see in the Energy Strategy being developed by the Department for the Economy in the context of the UK Government legislative target of net zero carbon by 2050. The Energy Strategy will determine the future priorities and potential changes needed to achieve this target.

The Committee asked four questions as part of the Micro Inquiry as follows:

1. What would you like to see as the key elements of the Energy Strategy?
2. Where do you see the future of renewables?
3. How could the Energy Strategy help achieve emissions targets at net zero carbon?
4. Does cleaner and greener have to mean more expensive in terms of the Energy Strategy?

The Committee received a wide variety of responses from across energy and businesses organisations, consumers, individuals and academics.

A list of respondees is included at **Annex A**.

Energy policy is developed in the context of the wider climate change commitments set by the UK Government and at European and global level. The timeframe is set by the 2020 to 2050 ‘net-zero carbon’ commitment. However, it is recognised that the choices we make locally in terms of energy have the potential to shape our economic and social well-being well into the future. There are a wide range of options as to what our policy and investment priorities might be in terms of energy.

The Committee’s aim in carrying out this Micro Inquiry was to engage with our key stakeholders to get their views and to develop a themes based report in order to stimulate debate on how we should approach the future of energy in Northern Ireland. This report is intended to be the beginning of that debate. The following Special Report is a summary of the themes which have emerged in response to the four questions asked.

Summary of Responses

Q1. What should be the key elements of the Energy Strategy?

This question looks at what stakeholders would like to see as the key components of the Energy Strategy, and which elements should guide what our energy system should look like in the medium and longer-term. Whilst there were a wide variety of responses and recommendations, there are a number of common elements to include in the Energy Strategy, which can be identified as follows:

1. **Targets and Objectives**
2. **Consumers and Affordability**
3. **Energy Efficiency**
4. **Decarbonisation of Heat**
5. **Transport**
6. **Energy Infrastructure & Planning**

1. TARGETS AND OBJECTIVES

There is support for the need for clear and ambitious targets within the Energy Strategy, primarily focused around the UK's target of net zero carbon by 2050. Some respondents referred to the overall objectives and interim targets which they believe should underpin the strategy including how they relate to wider climate change targets, particularly in relation to renewables. Given that Northern Ireland has achieved its 40% renewables target by 2020, there were a number of views on the targets which should be set for 2030. There was some reference to the linkage of targets with other jurisdictions as well as recognising the unique characteristics of Northern Ireland in the future strategy. The responses also recognise the potential for the energy strategy to realise economic opportunities which can be delivered in the short term as we emerge from the COVID-19 crisis.

Some respondents agree with the targets envisaged and others believe that, as a region, we need to be more ambitious. The point is also made that the new Energy Strategy will need to strike a balance between social, environmental, and economic factors and must be broadly acceptable across sectors and communities.

There was a view that the future strategy must have a statutory footing and binding targets that are clear, measurable, ambitious and in line with both the Programme for Government outcomes and the UN sustainable development

goals. It was highlighted that effective governance is needed, and enforcement mechanisms put in place.

There is a wish to see strong policy goals and targets for decarbonisation being set and being backed by Government. It is stated that strategy, policy and targets are rendered impuissant unless Government facilitates in a top down approach. It is also highlighted that achieving decarbonisation will require a dissolution of the old silos of heat, transport and power. For example, the electrification of heat and transport presents a significant opportunity to reduce the emissions of these sectors as the technology and know-how already exists to significantly decarbonise power at a reasonable cost to the consumer. Another view outlined that given the significant decarbonisation challenges in other sectors, it may be possible for the power sector to decarbonise ahead of 2050.

It was stated that the benefits of clear targets can be seen from NI's prior policy successes in relation to energy targets, i.e. the 40% Renewable electricity target outlined in the Strategic Energy Framework. It is suggested that in addition to overall targets there is additional value in setting interim targets for 2030, 2040 and 2050 for renewable electricity, and should be used as the model to calculate other sub-sectoral targets within the overall drive to net zero, namely renewable heat targets; renewable transport targets; CO2 intensity targets; reduction in waste to land fill targets; and energy efficiency / intensity targets.

There is support that the principle focus of the Energy Strategy should be the 2050 net zero carbon emissions target which the UK has adopted. All the actions contained within the Strategy should promote or at the very least be consistent with the aim of meeting the 2050 target.

It was highlighted that Net Zero is different to 100% reduction. This is a global issue, so reliance on buying carbon credits etc. defeats the purpose and just shifts the problem.

There were some views that NI should set its own emissions reduction target to underpin the most effective energy policy implementation possible. It was stated that on a UK wide basis, multi-year carbon budgets, underpinned by legislation provide the basis for all other policy measures - driving policy makers and solutions to deliver the most effective carbon reductions on a trajectory towards net-zero. It was also highlighted that the Scotland and Wales devolved administrations have set jurisdictional targets on the pathway to 2050.

It was suggested that the Energy Strategy should seek to reduce GHG emissions by at least 45% by 2030 based on Committee on Climate Change recommendations, with a view to assessing feasibility of a 70% reduction by 2030. The Energy Strategy should implement policies towards these targets, while moving towards a target of net-zero carbon by at least 2045. It should

also codify sectoral sub-targets for emissions reduction, e.g. for agriculture, construction, etc.

Attention was drawn to NI being in a unique position to contribute to and draw from decarbonisation initiatives in both GB and the RoI. There is a belief that NI has enjoyed previous success as a business location to develop supply chains for renewable technologies, but only when NI has shared similar policy targets to its neighbours. Given the economic benefit associated with locating supply chain activities within NI it is vital that future energy policy at least matches the level of ambition displayed in neighbouring jurisdictions such as Scotland and ROI, otherwise NI will miss out on these long term investments in supply chain activities.

In relation to renewable electricity targets, there is support for a clear roadmap and ambitious and measurable targets, mid-term reviews which maintain progress while ensuring technological innovations and economic efficiency. Some support the 70% by 2030 target. Others believe a target of 80% by 2030 should be set with 100% by 2035 and net zero by 2040. There are other calls for 100% renewable as soon as possible.

Respondents highlighted that energy issues are interconnected and a future Energy Strategy should involve a partnership approach to delivery with all tiers of government working together towards an agreed vision with aligned goals and SMART targets. A means of capturing energy data and reporting performance centrally will be needed to monitor progress.

Respondents also recognised the importance that the farming sector and agricultural practices would make in achieving targets set out in the draft Energy Strategy. There is support for setting a statutory energy efficiency target stating that the installation of energy efficiency measures is a no regrets win for all involved.

Some respondents suggested that the new Energy Strategy should endorse a *'Green New Deal'*, and drive emissions reductions through improving energy efficiency and maximising the contribution of renewables to the energy production mix. The strategy cannot sit alone and must connect into a Green New Deal that provides jobs for those people who work in coal fired power stations etc as they are urgently decommissioned and a move away from an economic model that is focused on growth which cannot be sustained.

There were views that consideration should be given to the introduction of an **NI Climate Act** to set carbon reduction targets for the region. Scotland and Wales both have specific targets, as does the Republic of Ireland. We know that 74% of those who responded to a discussion on climate change proposals through the Northern Ireland Committee for Climate Change were in favour of legislation.

Other views in support of a Climate Change Act state that Northern Ireland should have clear carbon reduction targets in accordance with the Committee on Climate Change Net Zero report with interim targets and achievable milestones at 2030, 2040 and 2050. These should reflect Northern Ireland's unique characteristics and be enshrined within a local NI Climate Change Act in a similar manner to the other UK devolved administrations.

2. CONSUMERS AND AFFORDABILITY

Many respondents highlighted the need for business and domestic consumers to be a key consideration in the Energy Strategy, both in terms of protecting the interests of consumers and in terms of the role of consumers in the energy transition. The responses highlight that consumer habits and behaviour in relation to energy will have an impact on the success of energy transition. The cost and affordability of energy to businesses and households is also a key consideration and the strategy is seen as an opportunity to tackle fuel poverty and to improve energy efficiency.

The Strategy is seen as an opportunity to produce a fair and affordable price for consumers, and ultimately remove fuel poverty as an issue within Northern Ireland. The Office of National Statistics Family Expenditure Survey shows that households in Northern Ireland pay more for their energy than other UK regions. It is suggested that if sufficient support is available in the short term so that energy efficiency/ renewable heat measures are affordable, the long-term benefits are a reduction in energy use, which should go a long way toward reducing the number of households in fuel poverty.

There is concern that raising bills will indeed push more vulnerable people into fuel poverty and they will therefore require some form of help and protection including grants and social tariffs. Energy in the future, which is required for good health and well-being, will make up a greater proportion of the household budget and therefore it is imperative that we use all levers to drive down the household bills. There is also a concern about the impact of Covid-19 and that economic forecasts are predicting a recession due to the pandemic and there are many households affected due to loss of jobs or the furlough process faced with an immediate drop in income and increased pressure paying household bills. In the short term, the level of fuel poverty may increase which will require immediate action.

It is stated that the energy sector must deliver for customers, with effective and sustainable competition in energy markets critical in delivering choice, value and innovation. The strategy must have the protection of vulnerable customers and the equitable distribution of the benefits of the transition at its core, while at the same time empower consumers to have more control over their consumption and to reap the benefits of new electric solutions. There is a level of support for consumer protection and incentivisation (grants/schemes for households).

Some Respondents suggested that a plan for smart metering should be considered in the Energy Strategy and that it is time now to progress a smart metering programme as a key enabler and there is a call for a review of the case for smart metering to ensure both customer and network benefits are assessed.

It is highlighted that educating and empowering consumers to make changes and to develop a different relationship with how they use and pay for electricity should be considered alongside a 'just transition' for vulnerable consumers. There is a need to provide value for money for consumers; alongside security of supply. The Energy Strategy should ensure that energy is affordable for all consumers both domestic and non-domestic. This necessitates a focus on both prices and usage.

There is a view that efforts should be made to mitigate the impact on businesses most negatively affected and protections put in place to safeguard households least able to afford any extra costs that might arise from the implementation of the new Strategy.

There were statistics outlined in relation to 160,000 NI households (22%) were in fuel poverty in 2016 * stating that the Energy Strategy should make provision for:

- 1) increasing the energy efficiency of homes through education and clear advice as well as improvement of the energy envelope of domestic buildings; and
- 2) assistance to low income households with increased means tested winter payments, fuel poor energy tariffs and accessible, sufficiently generous grants.

Some comments were made in relation to the impact of the Integrated Single Electricity Market (ISEM) on consumers. One respondent indicated that since the ISEM went live in Sept 2018 their average electricity bill has literally doubled. It is stated that the expectation was that the ISEM was going to reduce costs to consumers but it has made it far worse, despite coal and gas prices being at their lowest for years.

Another view is that thousands of families have been pushed into fuel poverty as a direct result of ISEM, but you won't hear that from most of those responding to this survey. Why? Because either they are the one making the money out of it and rather admit that there are fundamental issues with the set up, they instead bury their heads in the sand because they don't want the bad PR from it.

In relation to businesses it is stated that there are costs associated with 'transitioning' to more energy efficiency approaches and that is challenging for businesses. There is a suggestion that the Executive should appoint a Business Energy Champion for Northern Ireland. That person would represent

the views of the business sector in how it deals with the challenges of meeting energy costs, reducing energy consumption and investing in future models that support decarbonisation.

3. ENERGY EFFICIENCY

Energy efficiency was highlighted by several respondents as a key element of the Strategy.

Respondents referred to the need to promote the energy efficiency of homes and businesses through education, grants and support as well as through planning and building regulation. In addition to the environmental benefits, it is recognised that more efficient use of energy can also have positive health impacts and contribute to reducing fuel poverty.

It is suggested that energy efficiency should be considered an infrastructure priority for Northern Ireland. Energy efficiency not only helps to lower emissions, it also reduces energy bills and improves health and social inclusion.

Attention was drawn to the fact that the International Energy Agency (IEA) describes energy efficiency as the “first fuel” of all energy transitions. The IEA further states that energy efficiency is at the heart of any strategy to guarantee secure, sustainable and inclusive economic growth and that it is one of the most cost-effective ways to enhance security of energy supply, to boost competitiveness and welfare, and to reduce the environmental footprint of the energy system.

It is stated that to effectively tackle energy efficiency in Northern Ireland, it is crucial that a statutory energy efficiency target is set. The installation of energy efficiency measures is a no regrets win for all involved. Energy efficiency improves the fabric of each dwelling, decreases required heat consumption and in turn reduces carbon emissions. The 2019 BEIS Select Committee Inquiry report ‘Energy efficiency: building towards net zero’ cited net savings and benefits to the economy:

“Optimises infrastructure investment: Energy efficiency can prevent expensive investments in generation, transmission and distribution infrastructure and reduce reliance on fuel imports – with a present value of avoided electricity network investment of £4.3 billion; and Competitiveness: The UK is a net exporter of insulation and energy efficiency retrofit goods and services.”

A view is outlined that energy efficiency has a crucial role to play alongside any targets for renewable heat. Using less energy for the same level of residential or industrial output will make converting to renewable heat more cost effective. Furthermore, if sufficient support is available in the short term so that energy

efficiency/renewable heat measures are affordable, the long-term benefits are a reduction in energy use, which should go a long way toward reducing the number of households in fuel poverty.

There is a view that energy efficiency programmes funded through general taxation should be expanded alongside low-cost finance options to enable investment. It is stated that whilst supporting the continuation of NISEP, as it has been effective in improving energy efficiency whilst keeping costs down given the competitive nature of the scheme, we believe policies like this can be funded in different ways. The view is that paying for social policies through bills creates the most difficulties for those experiencing fuel poverty and risks undermining the broader social, health and wellbeing benefits that the activity brings.

In relation to homes and buildings, it is stated that there is a need to increase the energy efficiency of homes through education and clear advice as well as improvement of the energy envelope of domestic buildings. Also, that energy efficiency has a crucial role to play alongside any targets for renewable heat. Using less energy for the same level of residential or industrial output will make converting to renewable heat more cost effective. There is a need for education in schools and in the community at all levels about energy efficiency.

It is stated that an expansion of energy efficiency grant schemes and the introduction of low-cost finance options is also required to enable the retrofitting of other existing buildings. It is outlined that with new buildings, Northern Ireland has the opportunity to embed energy efficiency from the outset by bringing forward building regulations that future proof the energy efficiency of new developments. Efficiency in buildings must be a priority and people must be supported to make their homes as energy efficient as possible - all new buildings must be energy efficient and this must be enforced.

It is stated that there should be investment in a Green New Deal programme of public works to improve the energy efficiency of the housing stock and the public sector estate.

There is a call for an immediate review of building regulations to future proof new buildings ensuring near zero energy buildings for both commercial and domestic buildings. Immediate consideration should be given to commencing a longer term building insulation retrofit programme or at minimum commencing trials. There should be appropriate consumer education and advice programmes which promote energy efficiency in the home and workplace, offer realistic and proven low carbon alternatives for heating and promotes a shift to public transport.

There is also a call for a strategic retrofit project of all existing buildings or a decision to replace buildings with new zero energy buildings, where retrofit is not going to achieve the savings that we require. This will require building surveys - not drive-by assessments - by suitably trained and qualified

professionals, who can assess actual energy usage and propose solutions. Individual tailored solutions may be required if we are to achieve the optimal solution.

The point is made that for existing dwellings; public buildings and social housing stock should be tackled first. An expansion of energy efficiency grant schemes and the introduction of low-cost finance options is also required to enable the retrofitting of other existing buildings. It is stated that the importance of providing assistance for targeted, shallower measures should also not be underestimated - it may not be appropriate for homeowners or commercial consumers to embark on a deep retrofit. With new buildings, Northern Ireland has the opportunity to embed energy efficiency from the outset by bringing forward building regulations that future proof the energy efficiency of new developments.

There is a call for a reduction in the usage of energy via poorly insulated properties- we throw money at solar panels without factoring in the cost and carbon footprint of the materials and transportation of the equipment, maintenance cost such as solar fluid, inverter boxes etc. We need to properly insulate buildings so they only need minimal heating requirement to comfort level, replace all lighting with LED bulbs.

There is a call to revisit the architectural design of buildings so that they are zero carbon & energy buildings in their usage (not solely in their SAP/SBEM rating). This may require a re-consideration of the National Calculation Methodologies currently embedded in the SAP / SBEM protocols. It requires architects, QS, Construction Engineers, Real Estate professionals, M&E Engineers to fully understand the concepts of zero carbon/energy design - and the holistic approaches required. Building Information Modelling with Building Thermal Modelling may help deliver this type of new building.

It is outlined that digital energy reporting software can be used to track real time energy usage, help optimise performance and lead to more efficiency consumption and lower costs.

4. DECARBONISATION OF HEAT

There is support for clear targets and policy measures towards the decarbonisation of heat with respondents recognising the large proportion of our energy usage which comes from heat. A range of solutions are put forward including electrification, increase use of the gas network, hydrogen, geothermal as well as views on local heat networks and new technologies. There is support for the view that electrification provides the most viable route to fully decarbonise heat and should be supported in the new strategy, whilst recognising gas will be the key transition fuel. There is a call for clear policy measures to drive the electrification and decarbonisation of the heating and transport sectors through a decarbonised power supply, energy efficiency

measures and the use of low-carbon fuel alternatives, will need to be a key element of an Energy Strategy for NI.

Some respondents suggested that, in relation to heating, a strategy involving a combination of electrification measures, such as electric heat pumps in new buildings, and the decarbonisation of gas heating through low carbon fuel replacements such as renewable gas and hydrogen, is necessary provided a route to decarbonisation for gas is established.

It was outlined that the carbon intensity of the electricity generation sector decreases, increased electrification of the heat and transportation sectors provides an effective pathway to decarbonisation of the overall energy sector. There is an authoritative body of evidence that suggests that electrification will be the key to decarbonising many sectors of the world economy. There is a suggestion that the most appropriate pathway to the decarbonisation of heat between now and 2050 is to set clear targets and objectives for the decarbonisation of heat. To date little focus has been placed on electrification of heat particularly in the residential sector. Heat Pumps and direct electric heating are well established in other European markets and could facilitate significant decarbonisation if NI builds on its success of meeting its 40% RES-E target for 2020. Specific targets are therefore needed for the percentage of homes with renewable heating solutions installed by 2030, 2040 and 2050.

It was suggested that achieving decarbonisation will require a dissolution of the old silos of heat, transport and power. For example, the electrification of heat and transport presents a significant opportunity to reduce the emissions of these sectors as the technology and know-how already exists to significantly decarbonise power at a reasonable cost to the consumer.

It was noted that homes, the majority of which are heated using oil boilers, provides an opportunity for large expansion of 'low-regret', low-carbon heating via heat pumps and/or smart electric storage (alongside associated energy efficiency measures). The UK Climate Change Committee's (CCC) 'Reducing Emissions in Northern Ireland' report references the retrofitting of 25% of NI's oil-heated homes to heat pumps by 2030 and highlights the significant emissions savings of 0.5 MtCO₂ that this could bring. It should be noted that such a transition is unlikely without a policy framework to support the upfront costs associated with the deep retrofit needed which could be in excess of £20,000 depending on the age of the building. A delivery model will need to be developed to drive the switch from oil to electric heat in areas where it is not possible to transition to gas.

It was suggested that **District Heating** has the potential to play a role in dense, urban areas where there is a (waste) heat source nearby that can be utilised. District heating is seen as an enabling technology for the electrification of heat, where waste heat increases the uptake of high efficiency heat pump solutions. Given the relatively high capital costs, some degree of Government support or

funding may be required to drive investment in large district heating networks in Northern Ireland. We recommend Local Authorities harness the expertise of district heat industry participants through competitive tendering for private investment partners to jointly develop and own projects.

There was a call for clear policy measures to drive the electrification and decarbonisation of the heating and transport sectors through a decarbonised power supply, energy efficiency measures and the use of low-carbon fuel alternatives, will need to be a key element of an Energy Strategy for NI. Another view is that we look to create heat networks in new estates and communities close to abundant sources of waste heat, geothermal or communities where large-scale heat pumps or heat/power generation is possible.

It was highlighted that with a 68% reliance on home heating oil in Northern Ireland, there is a pressing agenda on examining those households off the gas network. There are currently a variety of new technologies being researched and tested in various sites across Northern Ireland. Oil hybrids, electric heat and heat pumps are all in the mix. There will need to be short, medium and long-term timelines put into the strategy with a range of options for those who are using fossil fuel heating systems (most of us at present).

It was suggested that we need to encourage low carbon technology demonstrators but R&D funding is necessary. For example, with funding in place, there are opportunities for organisations to collaborate to trial prototype technologies - e.g. the roll out of a district heating solution in one Council area helps to de-risk the roll out of similar projects in other Council areas.

There was a call for the introduction of heat networks into new residential and commercial developments. All new residential and commercial developments should include rooftop solar photo-voltaic panels.

It was stated that all new residential and commercial developments should make a provision for electric car charging.

There is a call to promote households to become microgeneration sites, and there should be a move towards ground source heat pumps in all new builds and away from fossil fuel. For estate builds either public or private promote communal ground source heat pumps complemented by wind turbines and or solar to power the infrastructure for the communal system.

A suggested proposed pathway and timeline for the decarbonisation of heat is suggested:

1. By 2020 - Maximising the potential of NI's Gas Infrastructure

Continue to maximise the potential of NI's gas infrastructure that will transport a low carbon fuel alternative in the long term:

2. By 2030 - Facilitating Change and Greening the Gas Network

- Extend the gas network to a further c.55,000 homes and businesses across NI.
- Facilitate biomethane injection into the gas network. Biomethane, often referred to as “renewable gas”, is a green renewable source of energy which can be injected into the existing gas network and is therefore an important feature of our future energy needs.
- Facilitate Compressed Natural Gas (CNG) refuelling stations on the gas network.
- Maximise the potential of biomethane injection into the gas network.
- Facilitate natural blends of hydrogen through the gas network as a result of blending that will commence through the GB gas network.

3. By 2050 - Delivering Net Zero

- Facilitate higher blends of hydrogen through the gas network on the pathway to a full 100% hydrogen networks.

It was stated that NI’s gas infrastructure provides a cost-effective pathway to deliver NI’s energy transition for heat to c.640,000 homes and businesses in NI without the need for bespoke solutions for individual properties. Therefore, consumers will not need to radically change their behaviour as the energy transition for heat unfolds.

Another respondent would like to see a complete programme of support funding / grants etc to allow N Ireland to transition from fossil fuels to the following renewable technologies - Biomass, Combined heat & power, solar PV, Heat pumps. Renewable technologies should be adopted in all new buildings and a date fixed to end the sale of oil & gas boilers.

There was a view that, with regard to heat pumps, combined heat and power and solar pv, the electricity networks were able to dictate the size and limit of any installation. The electricity grid needs overhauled to allow for the adoption of these technologies, to avoid the response of *“the grid can’t handle the additional load”*.

It was suggested that low carbon heating solutions such as heat pumps require to be promoted especially for new homes and those with no access to the gas network together with a retrofit programme which will require funding support mechanisms. Energy sectors need to collaborate to promote hybrid heating solutions to support a smooth transition away from fossil fuels.

There is a call for consideration to be given to extending the Utility Regulator’s statutory duties and powers for the emerging heat network in Northern Ireland. There needs to be a consistent framework to enable timely, financeable, and efficient regulated investment alongside appropriate market structures to attract capital in unregulated markets.

The farming sector outlines that the build-up of agricultural waste from that sector is developing into a growing issue for the sustainability credentials for NI

agriculture and agri-food, which is the hub of the local economy. This waste build-up is associated with the high levels of phosphorous in the area as well as significant and damaging NH₃ emissions. NI's heating demand is approximately 24,650 GWh, utilising these solids from agriculture can account for 19% of NI's heating demand. The resource biomass that is proposed to be used in our facility will provide thermal energy to nearby factories in the concrete and agri-food sectors within the local industry and also provide heating to social housing through a district heating network. This proposed solution and facility is a solution that can be replicated in other regions across NI where there is an abundance of resource feedstock locally or there is high levels of energy consumption requiring to be decarbonised.

5. TRANSPORT

Respondents recognised that the decarbonisation of transport is key to the energy strategy given the high energy consumption of the transport sector as well as the role of transport in reducing green gas emissions. There are several views which support a decarbonisation pathway for transport through the energy strategy. There are a range of views outlined in relation to alternative sources of fuel and technology such as electrification and hydrogen technology as well as the infrastructure required to support these. There are also suggestions that electricity offers opportunities to decarbonise Northern Ireland transport in a cost-effective manner.

There was a view that there is strong consensus from across the UK, as well as in Ireland, with respect to the role that electric vehicles must play. Vehicles sold over the next decade will remain on the roads well into the 2030s and beyond, which places an imperative on ensuring measures to support the deployment of EVs are prioritised now. Ambitions for EVs in Northern Ireland will be supported by an increasingly renewables-led power system.

There was a call for clear policy measures to drive the electrification and decarbonisation of the heating and transport sectors through a decarbonised power supply, energy efficiency measures and the use of low-carbon fuel alternatives, will need to be a key element of an Energy Strategy for NI. It is stated that the transport sector can be decarbonised via roll-out of electric vehicles, with effective incentives for consumers and the roll-out of charging infrastructure critical to delivery.

There was a call for investment in the infrastructure needed to support electrification of the transport sector. This should include electrification of the entire public transport fleet and provision for expansion of the electric car network. In relation to public transport, it is stated that we must look at planning - where we put houses, schools, shops, business, factories, leisure facilities - so that transport consumption is optimised. More investment into public transport systems as this would reduce energy usage via combatting single

person car journeys. Currently the public transport system is considered inadequate.

There was a recommendation that the Energy Strategy includes a number of explicit measures to promote electric vehicles, such as the development of specific EV targets for 2030 and beyond and to use these targets to support the long-term planning of critical infrastructure, as well as incentives to deliver these targets.

In relation to transport, it was suggested that end dates should be set for internal combustion engine sales, and electrification of transport will require significant investment in electric charging infrastructure to enable home, workplace and public space vehicle charging. Through a recent consultation process, the Utility Regulator has provided a commercial platform for profitable electric vehicle (EV) billing arrangements to operate however Northern Ireland has not yet succeeded in kick starting the EV infrastructure delivery provision that will be required to facilitate the transition to EVs and in the absence of such infrastructure will deter consumers from purchasing the EVs the vehicle manufacturers and suppliers are preparing for. In both the heat and transport sectors, incentives may be required to change customer behaviours.

From a transport perspective, encouraging a modal shift to active travel (walking and cycling) will have a significant impact on reducing energy use from transport, whilst improving health and well-being, particularly in a post Covid-19 environment.

With 33% of the energy consumed and 23% of the CO₂ emissions, the transport sector is another area of opportunity for Northern Ireland. Increased use of Public Transport, an active push to encourage cycling and the transition to electric and hydrogen vehicles can together ensure the right outcomes for the decarbonisation of transport.

There was also a view that hydrogen is of interest as a transport fuel because hydrogen vehicles result in zero tailpipe emissions and can be produced with low or zero CO₂ emissions. Others promote the rapid development of the foundations for a green hydrogen economy powered by electrolysis to deliver competitive hydrogen prices for public transport and HGVs.

Some respondents suggested that recognising the link between our energy and transport sectors, the development of this energy strategy offers the opportunity to support Northern Ireland and the island of Ireland more broadly to become a European leader in hydrogen technologies and drive the zero-emission agenda, specifically but not exclusively in the transport sector.

There was a view that there is an opportunity to deliver an all-island approach which would see hydrogen fuel cell electric buses, manufactured in Ballymena, used and powered across the island of Ireland.

It was suggested that hydrogen is the only practical option for decarbonising heavy transport. This means a quick, largescale introduction of hydrogen electric buses and refuelling technology can unlock conversion of trains, lorries, ships and emergency vehicles to hydrogen.

It was suggested the development of hydrogen refuelling stations that will allow the distribution of hydrogen to bus depots, train hubs and other transport hubs to meet the demand at a competitive price to diesel.

There was also an opposing view that hydrogen domestic vehicles should not be prioritised at this point stating that there are insufficient vehicles produced at present. Alongside this a clear message to consumers that Battery Electric Vehicles (“BEVs”) are the way forward will increase uptake. Hydrogen infrastructure can therefore be centred around HGVs and buses rather than public stations for domestic vehicles.

There was a suggestion about electrifying and expanding the rail system and for further consideration of pedestrianisation and building infrastructure for sustainable transport as well as considering more cycling/walking for shorter journeys and more public transport. Some believe that from a transport perspective encouraging a modal shift to active travel (walking and cycling) will have a significant impact on reducing energy use from transport, whilst improving health and well-being, particularly in a post Covid-19 environment.

It was suggested that NI’s innovation and world-leading technology should be developed, supported and promoted under the new Energy Strategy. The recent partnership between Translink and Mid and East Antrim-based Wrightbus to pioneer hydrogen-fuelled buses in Belfast is a very positive example and should be further encouraged. The UKG’s commitment to encouraging green transport gives NI the opportunity to be World Leaders in hydrogen technology.

It was highlighted that the Renewable Transport Fuel Obligation (RTFO) managed by the UKG’s Department of Transport provides a UK wide incentive for utilisation of Compressed Biomethane (CBM) as a transport fuel. This could play a role in stimulating investment in AD capacity at a time when there is no other subsidy mechanism in NI. There was a call for an assessment of the benefits of supplying gas for road transport from the Local Transmission System.

6. ENERGY INFRASTRUCTURE AND PLANNING

The issue of security of energy supply and efficient storage is highlighted as a key part of the energy strategy. It was suggested that securing supply includes lowering our dependence on fossil fuel imports, ensuring that the network and distribution systems are prepared for potential increases in demand, and removing barriers to grid connections. There was a view that we need to build

a grid fit for the future - there needs to be appropriate investment across the network, facilitating flexibility to increase renewable generation and support further electrification. It is also stated that securing supply includes lowering our dependence on fossil fuel imports, ensuring that the network and distribution systems are prepared for potential increases in demand, and removing barriers to grid connections.

Some respondents referred to the need for construction and completion of the North-South Interconnector and wider network infrastructure as a key priority. It is stated that the optimal operation of the ISEM for customers in NI and across the island requires effective connection of the NI grid to that in ROI to facilitate the most efficient flows of electricity across the island.

Investment in the grid as a key part of the strategic infrastructure was raised as well as issues regarding grid capacity in terms of facilitating the transition to renewables and variable renewable generation. Incentives and technology for battery storage was also highlighted as an issue which should be addressed. There were issues outlined in relation to barriers to grid connection, the cost of grid connection including connecting small scale renewable energy generation units. There was also a call for micro grid to be developed for more efficient locally produced power generation. The importance of links with Eirgrid and SONI were also highlighted.

It was stated that there is a need to prioritise grid improvements to enable future expansion of renewable infrastructure. There was a call for a clear strategy for electricity system flexibility in NI to facilitate increasing levels of intermittent renewable generation, while maintaining security of supply. Looking out to 2050, energy security in the all-island system, in the form of the ability to draw on zero carbon dispatchable generation for multi-day and even multi-week periods, needs to be addressed. The feasibility of technologies that could provide low carbon dispatchable generation and facilitate increased levels of variable renewables on the system, such as battery storage, CCS, and power to gas should be investigated for future use in NI.

There was a view that investment in the electricity grid and realisation of strategic infrastructure in a timely manner is crucial. This is an essential enabler to attracting and facilitating competitive low carbon generation technology to the Northern Ireland market place.

Grid connections issues were highlighted including connecting individual small-scale renewable energy generation units to the 11kV electricity network proved to be a major problem. For electricity grids there is the necessity for generated capacity to match the load.

It was stated that to facilitate increased renewable sources and electrification of heat and transport, it is essential that grid capacity is provided at a sufficient level ahead of need and to avoid having to upgrade capacity again prior to 2050. It is vitally important that policies and processes support the required

sustainable infrastructure delivery. The planning process needs to be more centralised and coordinated with greater community engagement and involvement. The construction of the North / South Interconnector and wider network infrastructure development is urgently required to a) improve competition to enable more efficient operation of the market, b) improve security of supply and create resilience and c) improve the facilitation of renewable power generation to meet future targets.

There was a view that the presence of a large renewable generation capacity might also need investment in a combination of further interconnectors or additional backup generation as well as additional storage (including grid scale battery storage).

There was an indication of support for programmes such as DS3+ that will facilitate the development of technologies to help manage an electricity system with significant levels of variable renewable generation and incentives for battery storage capability and expansion of resources into the technology.

It was stated that the lack of capacity to receive non-centralised generation throughout the electricity grid here is a matter that needs urgent consideration. MPANI members have a strong interest in facilitating generation of renewable or low carbon electricity for society. The location, extent and the availability of natural resource (eg wind) at their members' sites means that they are well placed to facilitate lower carbon technology rollout and innovation. The Strategy should address the lack of interconnection capacity to GB and RoI as it is constraining NI's ability to decarbonise - MPANI members' generating assets should not have to be constrained during periods of local low demand and high wind for example.

Attention was drawn to the fact that two of NI's biggest power generation sites are located within Mid and East Antrim at Kilroot (coal/oil fired but transitioning to gas) and Ballylumford (gas fired). The power generated by these sites is of critical importance to NI's security of supply. This was demonstrated in 2018 when the outcome of energy auctions left the potential for an immediate closure of coal generation at Kilroot. At that time, Council asked the NI Affairs Committee to consider the issue, and an inquiry was opened to which Council presented. The potential 'cliff-edge' effect of immediate closure was highlighted, and a resolution emerged where the Utility Regulator agreed alternative arrangements to ensure a smooth transition. Any future energy discourse should therefore reflect the strategic significance of both power generation sites to Northern Ireland.

Attention was drawn to the need for planning policies and processes to deliver strategic and timely decisions to build investor confidence in grid capacity. It is felt that planning at all levels needs to be more efficient, co-ordinated, and strategically aligned to deliver government policy and involve more local community engagement and involvement. It was stated that planning policy for renewable electricity generation and grid infrastructure should be consistent at all levels and across all locations. Some want to ensure that planning policy for

renewable electricity generation and grid infrastructure is consistent at all levels and across all locations. There was a call for Department for Infrastructure to be proactive in ensuring Local Development Plans and strategies are consistent with regional planning policies.

The importance of the role of local Government is recognised given its role in diverse energy matters through the delivery of its functions of, inter alia, planning, environmental health and building control. The point is made that local Government should be included as a delivery partner and be fully involved in contributing to a whole systems solution for energy management in Northern Ireland.

Q2. Where do you see the future of renewables?

1. RENEWABLES TARGETS

There was a clear recognition that renewable energy is key to meeting climate change targets and achieving the decarbonisation of the energy sector. There was a call to build on the success which Northern Ireland has had to date in exceeding renewables targets, to maximise the use of our natural resources and harness the potential economic benefits of renewables.

There was a view that investment in renewables should be promoted and that growing the economy should focus on the Green New Deal. It is highlighted that the green economy has struggled since the closure of the NIRO and that we are missing an opportunity to maximise the economic potential of our renewable resources.

In relation to targets for electricity from renewables, given NI has achieved its 40% renewables target by 2020, there were a number of views on the targets which should be set for 2030. Some were of the view that the target of 70% for electricity consumption generated from renewable sources by 2030 (as in England and Wales) seems appropriate for the NI context. It was stated that anything above this would be highly ambitious and unlikely to be met, especially if consumption/demand for electricity grows strongly with the anticipated boom in electric vehicle usage. It is also noted that even a 70% target for NI may be challenging in the absence of government subsidy.

Others believe that the 70% should be the least at which the target should be set and that perhaps, as with the 2020 target, NI should strive to outperform. It was highlighted that the Republic of Ireland has already committed to a target of 70% by 2030, a target which is likely to be revised upwards shortly. Wales has adopted the same position as ROI with a 70% target by 2030 whilst Scotland has taken a more aggressive approach targeting 100%. Northern Ireland could take its cue from Scotland with an ambition to generate 100% of

its electricity from renewables and aim higher in its target setting. It is stated that NI may be at a disadvantage if it is not more ambitious. Further targets are also suggested of 80% by 2030 and 100% renewables by 2035.

It is also stated that new competitive support schemes have been put in place in GB and Ireland to encourage the necessary investment to realise the ambitious renewable targets and deliver net zero emissions by 2050. There is a call for the energy strategy to consider the need and mechanisms for such support schemes, to provide investor certainty, develop innovative technologies and ensure that diversification of supply can be supported.

The point is also made that government must firstly lead by example by introducing renewable energy systems into its own buildings and vehicles.

2. A MIX OF SOURCES / TECHNOLOGY

A number of comments were made in relation to the mix of energy sources and technology required for the success of renewable energy. Many responses refer to a mix of renewable energy sources including onshore and offshore wind, tidal and solar.

A view is also outlined that Northern Ireland should consider narrowing its strategic choices and rely on proven renewable technologies that have been tested successfully elsewhere. Emerging technologies need considerable cost reduction before they would become affordable.

It was stated that the ultimate goal is to have an electricity system that is powered from a zero-carbon energy mix, which will be facilitated by increasing levels of renewable sources, alongside other innovative technological advances. There are suggestions that it has to be a mix of everything to make it work: wind, solar and tidal. A mixture of technologies is required for practical as well as energy security purposes. We need to look at all of them, the wind, hydro, tidal, PVs, large scale water harvesting, hydrogen, etc. A single solution would be a high risk solution so we need to spread the risk.

There is a call for road maps to be developed for decarbonisation in harmony with nature, indicating the mix of technologies that will be deployed to meet climate targets in an ecologically sustainable way.

The point is made about 'diversity', that given our geography wind power is a significant resource, but diversification into heat pumps, solar, tidal power will allow us to become a net exporter of energy.

However, there was a view that there are challenges associated with the weather-related variability of renewable energy sources and that a diverse mix of low ecological risk renewable technologies would help to reduce that variability.

Some respondents suggested that it cannot be a mono-technology, i.e. wind. We have relied too much on mono-technologies for energy for many years. In the 1980s GB electricity was 70%+ coal dependent. The miners' strike and the initial views on climate change led to a 'dash for gas' which saw us become dependent upon CH₄ for electricity (at conversion efficiencies significantly below that of a household gas boiler). With the move over to renewables we need a mixture of technologies for practical as well as energy security purposes.

There was a call for a matrix of smaller points of generation as opposed to smaller number of large generation points.

It was suggested a model would need to be developed looking at the optimum combination with wave/tidal, solar and bioenergy all having their place to increase resilience and predictability. A totally renewables-based power network would look radically different as it would have a combination of generation, grid-based storage, micro grids with local generation and storage plus other demand management systems.

It was stated that one size will not fit all - wind turbines will be more suitable in some areas or solar panel or tidal wave solutions or AD in other areas - the solution needs to fit the local area, involve local people as part of the decision making to understand the resources they are rich in, could use to their advantage and work in partnership with local economy to consider, develop and deliver.

Some respondents are of the view that consideration should also be given to new technologies that enhance the use of renewable energy.

It was stated that exploration of innovative options such as hydrogen production from renewable energy, energy storage and biogas to grid application may be appropriate when considering Northern Ireland's energy mix. Hydrogen buses have been highlighted as innovation in the public transport sector and could also establish NI as a net exporter of technology.

It was suggested that post 2030, policy support must support the commercial and technological development of those longer-term solutions, such as the use of hydrogen within the gas network. The gas networks offer both the transition and the delivery opportunity for net zero carbon, most notably with biomethane and hydrogen. A view is outlined that the Northern Ireland Energy Strategy should leave open the option to explore the role of both CCS and hydrogen in decarbonising gas.

3. INFRASTRUCTURE & STORAGE

Responses highlight that infrastructure for future renewable energy development is a key consideration. It is stated that adequate infrastructure

and associated investment must be carefully considered to support plans for any new renewable generation and associated technology. It was also suggested that significant battery storage capacity should be built into the network.

The point was made that energy storage overall will play a significant role in assisting with bringing more renewables onto the system and delivering valuable system services. There is also a call for the Executive to develop a separate action plan to encourage large scale storage, localised storage and biogas.

It was stated that NI is now the only part of the UK and Ireland where there is not a Government-supported route to market. Without appropriate market mechanisms, there is the strong possibility that the investment in renewable development and deployment will stall even further in Northern Ireland.

The point was made that grid infrastructure improvements are essential for the successful deployment of large-scale renewables projects throughout NI. There is a call for a managed transition, in line with demand, consumer need and a sustainable renewable solution for Northern Ireland. The existing transmission infrastructure should be utilised to maximum effect and public discourse around these issues should be encouraged.

It was highlighted that, with circa 23,000 generators now connected to the electricity network and approximately 93% connected to the distribution network, an increased renewable consumption target for example of 70% by 2030, would require doubling the amount of renewable generation connected. This will require delivery of new infrastructure or upgrading existing infrastructure in places. Delivery of this infrastructure in a timely and coordinated manner is critical and will require a set of coordinated policies and approach within local planning authorities.

It was stated that grid costs also tend to be high and connection timelines slow. Capacity for new renewable projects to connect is lacking therefore urgent action must be taken to ensure that the projects required to meet new targets can be delivered on the ground. Should a proactive approach be taken in this regard, it would also help stimulate investment by creating certainty for developers/investors that there are reasonable prospects of connecting new projects.

The point was made that planning for transmission infrastructure and wind installations remains a significant challenge in NI, with key projects such as the North-South Interconnector taking years to progress through planning. There is a call for a revised approach to grid development and a review of the planning process to ensure compatibility with Northern Ireland's new Energy Strategy.

It was suggested that ambitious target for renewable generation must be matched by the release of investment in grid infrastructure which will help

reduce the costs of renewable deployment. There is limited capacity left on the grid in NI to connect new renewable electricity capacity, so it is vital that new grid is built within the coming decade or otherwise, the renewable electricity required will not be able to connect or will see very high constraint levels.

In terms of the provision of new renewable energy infrastructure to meet the target, there was a view that this requires a careful balance - which may be pursued in a number of ways, for example: balanced decision making through the planning system, based on the policy framework provided through the Local Development Plan; greater use of and incentives for storage solutions to prevent waste of generated power; and greater use of the offshore marine area for large scale renewables that cannot be accommodated onshore in an appropriate manner.

In terms of renewables infrastructure, it was stated that renewables are what the consumer wants, but the infrastructure is expensive and needs governmental backing and support. The natural choice is to develop small scale wind turbines but this cannot be done by individuals. It will only work if there is a financial payback, if the planning system realises the national benefit of these installations and if the electrical network owners facilitate the use of this generated power within the grid.

It was also suggested that achieving 80% renewable electricity by 2030 will require the development of new renewable energy infrastructure and the repowering of existing sites. Repowering is the process of replacing old turbines with newer, more efficient ones. Repowering has many associated benefits such as allowing for more efficient use of operational sites and the continued use of grid infrastructure.

The point was made that the Committee on Climate Change articulates concern about developing energy infrastructure that relies on large-scale imports. Given that the island of Ireland has lots of wind and water which are the ideal conditions for the production of 'green hydrogen' which involves electrolysis powered by a wind farm, investment in indigenous hydrogen production sites across the Island is both prudent and visionary.

4. ONSHORE WIND & SOLAR POWER

There were some views that onshore wind and solar will continue to be the primary sources of low carbon electricity generation in NI. It is outlined that high-quality onshore wind resources mean that NI can afford to be ambitious in its target setting for producing electricity from renewable sources.

There was a call for continued investment in onshore wind energy as a low-cost form of renewable energy that would represent value for money for Northern Ireland consumers. There was reference to schemes such as the 'Contracts for Difference' in GB and the RESS scheme in Ireland. It was

suggested that without support for onshore wind the green energy success of the past decade is unlikely to be repeated, with the Climate Change Committee's NI report recommending that some form of support scheme would be needed to provide sufficient deployment of renewables.

It was suggested that the Energy Strategy should advocate for the introduction of an auction system, similar to the Renewable Energy Support Scheme (RESS) active in Ireland, bound to a clear and codified renewable energy target. As discussed, this target should be at least 80% by 2030. Through this approach, price stability is provided to renewable investors through a Contract for Difference (CfD) mechanism (similar to the British scheme), and an investment is encouraged to meet a specific amount of additional capacity as determined by targets.

It was stated that in 2019, for the first time in over 15 years, no large-scale onshore wind farms became operational in NI. The point was made that, to decarbonise the energy sector, we need to ensure that NI continues to represent a positive investment environment for renewable energy, through providing policy certainty and a long-term vision for renewables. Again it was highlighted that the UK Government has announced the inclusion of all renewable energy technologies in auction round four of the Contracts for Difference and that projects in Northern Ireland are highly competitive and should be given the opportunity to secure contracts.

There was reference to the recent success of onshore wind, with 1.4GW of installed capacity and emissions in the power sector 24% lower than they were in 1990. It is highlighted that the all-island Single Electricity Market is notable as it is a small, isolated power system, with a high penetration of renewable generation, low levels of interconnection, as well as constraint challenges. It was suggested that NI can seek to build on the success to date in this sector as part of the zero-carbon energy transition.

It was suggested that onshore wind and solar PV power are now, frequently, less expensive than any fossil fuel options, even without financial assistance. There was some support for a further roll-out of roof-top solar panels, with some concerns about solar farms.

A view was expressed that a significant increase in onshore wind development will only be realised if prompt planning decisions facilitate the essential investment in the grid; and if Northern Ireland proves to be an equally attractive place to invest compared to neighbouring markets.

The point was made that the ecological impact of an onshore windfarm is determined by its location and scale. There was support for the increased roll-out of onshore wind in harmony with nature with deployment to be focussed in areas of low risk for wildlife.

5. OFFSHORE WIND AND TIDAL ENERGY

The point was made that offshore wind is now a proven and competitive technology and one that is being facilitated in neighbouring markets of GB and Ireland. Well positioned offshore wind can diversify the supply mix and could reduce the need for grid infrastructure, as well as providing an efficient and competitive renewable energy source. There are calls for a study on the development of offshore renewables to assess the benefits and contribution of this technology, alongside consideration of the transition of the wider power system and market.

The potential for tidal energy also features in responses, for example, harnessing the tidal power in Strangford Lough. There is a view that, to date, renewable energy production in Northern Ireland has mostly been land based. The unique tidal energy resource off the north coast between Fair Head and Torr Head has yet to be exploited. Another response suggests offshore wind turbines that can also harness be combined with tidal energy, to feed into the same tower as the wind turbine maximising the one source.

It was stated that the NI coastline provides the opportunity to utilise offshore and marine technologies to achieve their climate ambitions. However, it is unlikely that offshore projects will be delivered before 2030 under current policy. The NI Energy Strategy should include a plan for offshore technologies.

It was highlighted that offshore wind will require a support scheme to continue to be developed, especially if the future of the electricity grid will be upwards of 90% of generation with next to 0 marginal cost. Otherwise continued renewable development will become price cannibalising. It is also noted that there exist a number of challenges to development of offshore wind in Northern Ireland such as access to grid, suitability of seabed sites as well as the absence of any renewables support mechanism in recent years.

There was a view that onshore wind will be the sector in which we can deliver on its decarbonisation objectives during the next decade in particular. It is stated that even in jurisdictions with significant offshore wind targets, ambitions for onshore wind remain with both technologies needed to play their part.

The point was also made that offshore wind development can have serious impacts on the marine environment including our seabirds. It was stated that in order to ensure further offshore wind deployment in harmony with nature, the sector must urgently adopt new approaches across the UK and devolved administrations.

There was a view that onshore wind and solar will continue to be the primary sources of low carbon electricity generation but that the renewables sector is innovative and as we see costs drop for offshore wind, the first tidal projects in

Scotland and new advances in floating wind, it will be important for policies to be adaptable as new opportunities develop.

Reference was made to Scotland positioning itself as a future hub for green hydrogen production from offshore wind. It is estimated that green hydrogen will provide 30% of future energy demand by 2050 which amounts to 330 - 350TWh. This translates to dedicated offshore wind capacity of 70 -75GW by 2050. The current oil and gas industry are worth £11 billion per annum to the Scottish economy but moving to hydrogen production is estimated to be worth £12 billion per annum by 2030 rising to £22billion per annum by 2050. Scotland is looking to pivot their offshore engineering expertise and supply chain from oil and gas to offshore hydrogen production as the new energy carrier.

6. MICRO-GENERATION / LOCALISED POWER GENERATION

A number of points were made in relation to the role of micro-generation and local based solutions in renewable energy. There is a call to diversify renewable sources and invest in research and development including micro-generation.

It was stated that a totally renewables-based power network would look radically different as it would have a combination of generation, grid-based storage, micro grids with local generation and storage plus other demand management systems.

An idea of micro-generation was explained as most homes having some form of electricity generation and storage. There is a reference to household micro-generation and battery storage, where homeowners generate and store the energy they use, without the complexity of needing to feed into the grid.

It was suggested that if there was an opportunity for everyone to get a 0% loan or grant to create an income from micro energy then there would be a greater uptake in renewables, and there was a call for better regional infrastructure to support micro generation in all communities.

There were views outlined in relation the need to incentivise more small-scale renewables generation, and dramatically up-scale community energy projects.

It was also highlighted that microgeneration provides an opportunity for small businesses to invest in solutions that work for them, reducing their dependence on a centralised energy grid and helping to reduce carbon emissions. There is evidence that 47 per cent of microbusinesses indicate that they would consider generating their own electricity to avoid paying expensive energy prices. However, it is stated that micro-generators are being discouraged in the market through a combination of regulatory, policy and practical constraints.

There is a call for a holistic strategy for promoting microgeneration and storage across the small business community.

Q3. How could the Energy Strategy help achieve emissions targets at net zero carbon?

Stakeholders submitted a range of thoughts in relation to how the energy strategy could effectively allow NI to reach the emissions targets set for 2050.

1. THE ROLE OF GOVERNMENT

In relation to how the NI Assembly and the Executive operate, it was suggested that a representative should be present at each United Nations Climate Change COP (Conference of the Parties) to jointly facilitate ideas made across the wider U.K. and discuss any other regional dynamics. One stakeholder indicated they had evidence that some Government departments had recently replaced biomass heating systems with heating oil or natural gas, suggesting a backwards step. They are willing to provide more detail if required.

2. PROMOTE THE ENERGY STRATEGY AND INCREASE PUBLIC AWARENESS

Stakeholders felt that the public needed a further awareness raising campaign about the draft Energy Strategy and how their role as both businesses and consumers is important to its success. Additionally, stakeholders would like to see involvement of communities at every level so that citizens are aware of their role and responsibilities. To facilitate end users as they start to consider what actions they can take, they felt the number of energy advice/information points could be reduced and responsibility given to one expert body to provide advice that is consistent with the strategy.

3. SECTOR BY SECTOR APPROACH

Some submissions pointed to an approach that requires working through every sector one by one to find and the most effective way to remove carbon. In doing so, a number of sub-sectoral targets and milestones would be required. To this end, more research would be required to find appropriate low carbon solutions.

4. THE GAS NETWORK

There were questions about the proposal to roll out the natural gas grid across Northern Ireland, with further speculation on the likelihood of being able to generate enough blue/green gas to replace natural gas. With hydrogen being a lighter/less dense fuel, greater volumes will be required and it was suggested that it was only used for priority industries.

5. IMPROVING BUILDINGS

Many respondents indicated that before turning to renewable energy sources that improving the energy efficiency of existing and new buildings was paramount. To this end, regulations for new buildings should require them to have renewable options installed, smart meters and high quality insulation. It was pointed out that the best way to combat fuel poverty was reducing the need for energy consumption and therefore also the cost of keeping warm. Some stakeholders have identified a need to move on from energy performance certificates as they are too broad. "The most common one for buildings is to measure in kWh/m²/annum. Every sector will have a previously tried and tested metric, we just need to find out what they are and make them mandatory."

The NI government should also consider introducing legislation such as a Warm Homes Act, which would set out statutory targets for renewable heat uptake and energy performance of buildings to encourage progress and to provide long-term direction and certainty to industry.

6. PLANTING FORESTS

Several stakeholders pointed to off-setting carbon production by planting large areas of native and diverse trees. As well as forestry service led schemes, there could possibly be an incentive for farmers and/or land-owners to diversify and plant trees in an area of their land (with requirements such as a specified amount of time, specific percentage of certain species included etc). This has an additional advantage of promoting natural habitats for wildlife and possibly providing more places for recreation.

7. GRANTS TO ALLOW ENERGY COMPANIES TO SUPPLY CARBON NEUTRAL PRODUCTS

There was a suggestion to require energy companies to make their sources carbon-neutral by a certain date. To this end they would need financial support so that the cost would be shared by individuals/business/energy companies and the government.

8. LIFESTYLE CHANGES

To achieve targets, consumers would need a substantial change in daily behaviours. For example, working from home where possible, increased use of bicycles through an enhanced cycling infrastructure and more frequent use of the public transport network when travel is required.

9. PRICE FOR END USERS

Some stakeholders felt that end users consuming high carbon energy products should pay more tax, as this would be an incentive to switch to zero carbon options. Others were of a view that only by making energy products cheaper will users be convinced to move to cleaner options for transport, heating and power. Before turning to new energy products, energy efficiency support schemes and policy measures were cited as a critical tool to ensure those with low incomes, rural consumers and other vulnerable consumers are not left behind in the transition to a zero carbon economy.

10. END USER INCENTIVES

There were a number of ideas put forward to help end users understand what their options were and assist with financing:

- Make subsidies for wind and solar power available and well publicised, as well as building the necessary infrastructure for sustainable transport, i.e. walking, bikes, e-bikes and public transport. Expanding the network of Greenways and pedestrianising much of Belfast city centre;
- Provide financial support for all to retro-fit existing buildings;
- Start a system to allow aggregation of small projects to address owner occupiers/single family homes which are administratively burdensome;
- Increase the existing home solar panel grant;
- Set a carbon tax to limit the use of high carbon energy products;
- Provide financial incentives for micro generation;
- Improve the public transport system and make it more user friendly;
- Expand the existing Park & Ride facilities to encourage use of public transport;
- Improve the network of charging points for electric vehicles; and
- Set a congestion charge for motor ways and city limits or start adding tolls to roads to lower usage and pay for upkeep.

11. SKILLS

Respondents indicated a need to develop a suitable skill set in NI and to develop the talent locally to take new technologies and infrastructure forward. An effective strategy should identify key areas of work for government, local

government, educators, business and community, and should preferably be co-produced to maximise the expertise available and ownership of the changes to take place.

12. NEW TECHNOLOGIES

Many respondents had an opinion on which technologies should be explored and invested in to achieve the net zero carbon targets. Those cited were:

- Explore opportunities for district heating schemes;
- Tidal power, solar power and onshore and offshore wind which require better planning policy;
- Waste management could be improved and be a source of energy;
- Battery storage at renewable sites such as wind farms; and
- The possibility of a second North South Interconnector.

There were mixed feelings about the use of biomass and how carbon-neutral it is, with evidence suggesting much of the UK's biomass used for combustion is shipped from overseas. Local production would reduce transport related emissions and is more sustainable if appropriately managed. However, a large-scale shift to biomass for heating would drive up air pollution, particularly in urban settings. A policy of encouraging biomass only for buildings not suitable for heat pumps and off the gas grid is an approach being used in England.

13. AGRICULTURAL PRACTICES

Stakeholders recognised the importance a change in agricultural practices would make in achieving targets set out in the draft Energy Strategy. This may require a change in energy feedstock such as digestate and solid separated slurries. The main opportunities for reducing emissions from agriculture are evidenced through crop and soil management, measures to reduce livestock intensity, demand-side measures and in the context of this micro inquiry, energy efficiency. The Economy Committee should refer to the report 'Towards a Land Strategy for Northern Ireland' which presents proposals and recommendations for developing and implementing a Land Strategy for Northern Ireland. "A Land Strategy would provide a more holistic understanding of land/land use and help deliver a more strategic approach to future land use decision making, including energy infrastructure. The UK Committee on Climate Change have endorsed the need for a strategic land policy in Northern Ireland (Reducing Emissions in NI, February 2019). "

Q4. Does cleaner and greener have to mean more expensive in terms of the Energy Strategy?

Respondents raised a number of issues in response to this question.

1. CAPITAL INVESTMENT AND PAYBACK TIME FOR ENERGY USERS

There were varying views of how the transition to renewable energy would affect the price for the end users. However, the majority of responses noted that while capital investment at the outset would be significant, the more decarbonised energy is used, the cheaper it becomes in the longer term. Rather than adding extra costs to end users, it was suggested that a reorganisation of resources and finances would allow the transition to succeed. Investment in renewables was thought to be a better alternative to burning fossil fuels which could be a false economy in the long run. There would also be the creation of "green jobs" in during the transition.

Attention was drawn to the fact that upgrading electricity networks and the grid would require substantial investment but there were gains to be made in the long run. To make cost savings, setting up local micro grids were suggested, for example household solar PV systems linked to battery storage to community scale solar PV/wind turbine and storage systems. Incentivising such schemes compared to the large grid scale upgrades would be worth investigating, particularly as they could increase resilience and security of supply.

As we produce more and more of the energy we consume from domestic renewable sources, we will be less reliant on the fluctuating costs of coal, oil and gas. That will mean greater predictability on prices but not necessarily lower ones. There is an abundance worldwide of fossil fuels such as oil, gas and coal which will keep their prices very competitive in the future.

There was evidence there may be additional positive outcomes in relation to health and end user finances in the longer term. "Once the upfront capital investment is complete, users should be able to enjoy a better quality of life, improved health outcomes and lower fuel bills". However, other submissions noted that many end users would not have the funds to afford any substantial upfront costs. On this, there were a few ideas about funding switching to renewable energy. A range of schemes were suggested for end users: Grants and finance schemes to change from home heating oil to natural gas and

house value-based loans. Provision of financial support was suggested as a necessity for low income households along with fair charging of transmission and distribution network costs.

A number of responses highlighted the need for thought to providing a district heating network for all housing where the pipeline is passing to be connected up to the heating network giving the consumer the option to avail of the service or not. Increasing choice for end users should result in a more competitive market and lower bills.

For small businesses, stakeholders have asked for a strategy for promoting microgeneration, storage and energy efficiency across the small business community. They also asked for attention to detail in relation to premises either rented or owned, and the obstacles they may face.

Thought was also given to how hydrogen is increasingly seen as a green fuel of the future and could replace natural gas. Plans are underway for gas networks to transition to hydrogen over the coming three decades.

For commercial users in particular, they must be shown the benefits of renewable energy. If the cost is too high, then co-operatives should be formed. In relation to the recycling of waste, an example was given showing how the sector demonstrates it is possible to develop generators producing renewable energy that are not reliant on subsidy.

2. EDUCATION CAMPAIGN FOR END USERS

It was felt that an education campaign was needed to encourage users to adopt renewable energy sources and that they must be shown examples of how an initial outlay will save money in the long run.

3. ELECTRICITY TARIFFS

Before switching to renewable systems, electricity tariffs will need to be reviewed as they need to allow flexible time of use systems. The underlying costs of running the electricity system may change profoundly.

It was suggested that the cost of using renewable energy should be supported through Public Service Obligation where everybody pays to support renewable electricity generation regardless of the source of the energy they use.

4. TAXING THE USE OF FOSSIL FUELS

Introducing higher taxes for the use of fossil fuels was suggested: ***"If you tax at the right level, energy will become more expensive, and people will switch"***.

5. ENERGY EFFICIENT BUILDINGS

A number of responses highlighted that with improved energy efficiency of buildings less energy would be consumed. A novel idea was that energy companies could provide funding to insulate buildings then invoice this cost against the energy bill along with reduced costs for the energy element for the bill. Some submissions also suggested that consideration should be given to some sort of rates rebate/discount connected to energy efficiency in homes.

6. TRANSPORT

Stakeholders suggested that free public transport for workers commuting would encourage individuals to use the public transport network. This would help with household finances via less expenditure on cars and fuel and reduce the number of cars on the roads whilst having a positive impact on climate change. Some submissions highlighted that the initial purchase price of an electric vehicle is in the region of 3 times the price of the cost of a diesel which is cost prohibitive.

7. FUNDING FOR DEVELOPMENT OF RENEWABLE ENERGY SYSTEMS

Stakeholders urged that consideration is given to incentives to encourage uptake of renewable energy technologies in industry as most companies will only invest where they can see quicker payback, e.g. two years. Tax relief incentives may also be an option.

A support scheme to help companies reduce the financing risk associated with investments in renewable technologies would help.

Annex A

PRIVATE INDIVIDUALS¹

1. Mark Johnston
2. Individual
3. Individual
4. Henry Johnston
5. Jim Anderson
6. Individual
7. Alex Jones
8. Jake Dalzell
9. Philip Stinson
10. Individual
11. Individual
12. Jim Magowan
13. Fiona Brazill
14. Gary Quee
15. Brian Quinn
16. Càit Ashe
17. Roger Kernaghan
18. Kelan McClelland
19. Mary Hunter
20. Ross McClelland
21. Rachael Preston
22. Individual
23. Ryan Cairns
24. Christopher McGuinness
25. Stephen Joyce
26. Jonathan Farmer
27. Colin Mooney
28. Individual
29. Mark Alexander
30. John Wood
31. Peter Wilson
32. Jonathan McCullough
33. Jonathan Traynor
34. Tom White
35. Kim Holmes
36. Mark Allen
37. Douglas Frazer
38. Fiona Wallet Thompson
39. Lionel Knobbs
40. Oliver Moran
41. Individual
42. Jennifer Curley
43. Tim Clarke
44. Una Walker

¹ This includes a number of individual responses where full names were not provided. It also includes a number of responses from individuals listed generally as business owners or farmers.

45. Katrina Gillespie
46. Philip Montgomery
47. Desmond Brown
48. Dwight Mettleton
49. Judith Bankhead
50. Individual
51. Mrs Bailey
52. Oisin Boyle
53. David Mcwhirter
54. Ryan cairns
55. Dr Tom Fitzsimons
56. Suzanne Blair
57. Stephen McLaugjlin
58. Caroline Dalton
59. Liam Duggan
60. Individual
61. Maria McManus
62. Individual
63. Hannah Kathleen
64. Individual
65. David Dunlop
66. Deborah keatley
67. Avril Robson
68. Individual
69. Paul Mahon
70. Lee Robb
71. Mark Hughes
72. Wesley Caldwell
73. Amanda maxwell
74. David Kernohan
75. William Gamble
76. John Wilson
77. Joe McConville
78. Evan Allen
79. Sandra Crawford
80. Gordon Hughes
81. Malcolm Maxwell
82. Jeremy Hobson
83. Eccles Richard
84. Noel Harrison
85. Thomas Hill
86. Richard Newell
87. Individual
88. Nicholas Armstrong
89. Dorothy Kernohan
90. Darren Gallagher
91. Ciaran Quinn
92. William Browne

Organisations / Businesses

1. Ulster University
2. The Attenborough Project
3. Marine Projects Ireland
4. Ulster Wildlife
5. The Fermanagh Trust
6. Northern Ireland Water
7. Mineral Products Association NI
8. Safety Health & Environmental Services (NI) Ltd
9. ARCH
10. Okotech Ltd. T/A heatboss
11. OS Engineering
12. Queen's University Belfast
13. Erasmus University Rotterdam
14. EnerChem Solutions Ltd
15. Bryden Centre, Queen's University Belfast
16. Action Renewables
17. PGM Developments Ltd
18. Regulatory compliance services
19. Mid and East Antrim Borough Council
20. Northumbria University
21. B9 Solutions Ltd
22. Competition and Markets Authority
23. Invest Northern Ireland
24. Minister for Infrastructure, Department for Infrastructure
25. ABO Wind NI Ltd
26. National Energy Action Northern Ireland
27. South Eastern Regional College
28. Phoenix Natural Gas Limited (PNGL)
29. Stop the Newtownabbey Pig Factories
30. Firmus Energy
31. GNI UK Limited
32. Queen's University Belfast
33. Ulster Farmers Union (UFU)
34. Electricity Supply Board (ESB)
35. Northern Ireland Chamber of Commerce and Industry (NI Chamber)
36. SONI Ltd
37. Indaver
38. Centre for Advanced Sustainable Energy (CASE)
39. SSE
40. Drumlin Wind Energy Co-operative Ltd and Northern Ireland Community Energy (NICE) Ltd
41. The Electricity Association of Ireland
42. Energia
43. RSPB NI
44. NIRIG (Northern Ireland Renewables Industry Group)
45. Hegan Biomass Limited
46. Federation of Small Businesses
47. McCartan Muldoon architects
48. RHANI
49. RES
50. Stratagem on behalf of Ryse
51. J S Dunlop Ltd
52. John Ann & Richard Hughes
53. John Mcelderry M&T LTD

54. Member of Friends of the Earth
55. BSD training
56. Green Future Homes
57. Keenaghan mushrooms
58. MILESTONE RATHFRILAND LTD
59. MAFEGES. (Mentally Affected Farmer who Entered a Green Energy Scheme)
60. IJ PROPERTY AND TRADING COMPANY
61. W&A Nixon & sons LTD
62. Kennedy Farms
63. Hillcrest Day Nursery
64. DRL Energy Ltd
65. The Tile Shed
66. Gerni N.I.
67. Jamie Delargy(enirgy.info - an energy information website owned and operated by DP Ireland Ltd)
68. Montalto Farms LTD
69. You Generate CIC
70. John J Forsythe Poultry Farm
71. CHP Mechanical services Ltd (Commercial Heating & Renewables)
72. MF Chickens LTD
73. Ballyboyland Biomass
74. Premium Pellets
75. CS Renewables
76. L & C Gordon Poultry
77. Mutual Energy Limited
78. Ulster University
79. Energy Efficiency Group NI
80. NILGA
81. NIE Networks
82. SINN FÉIN
83. Tourism Northern Ireland
84. Minister of Agriculture, Environment and Rural Affairs
85. Department for Communities, Historic Environment Division
86. SONI
87. Royal Academy of Engineering
88. Friends of the Earth
89. HHT Renewables
90. Consumer Council

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ISBN 978-1-78619-047-5
