Future Infrastructure Investment and Delivery in Northern Ireland - Policy Consultation Paper

Comments by

Northern Ireland Environment Link

7th November 2020

Northern Ireland Environment Link (NIEL) is the networking and forum body for non-statutory organisations concerned with the natural and built environment of Northern Ireland. Its 60 Full Members represent 190,000 individuals, 262 subsidiary groups, have an annual turnover of £70 million and manage over 314,000 acres of land. Members are involved in environmental issues of all types and at all levels from the local community to the global environment. NIEL brings together a wide range of knowledge, experience and expertise which can be used to help develop policy, practice and implementation across a wide range of environmental fields.

Due to time constraints the comments below constitute our initial comments and as such do not represent the agreed views of Members as we were unable to give members the usual time to review and sign off this response. If you would like to discuss these comments further, we would be happy to do so.

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Green Recovery

1. What areas of infrastructure do you believe are key to a Green Recovery plan?
2. How can we promote its key principles in longer term infrastructure planning?
3. What economic and social benefits should we prioritise in this recovery plan?

As we begin to consider how to "reopen" society, discussions have emerged on the need for a "Green Recovery", or to "Build Back Better". The lockdown has allowed us to reflect upon our priorities as a society and we now have an excellent opportunity to rethink how we do things. A recent LucidTalk poll[1] has revealed strong public support for a green recovery – 75% have appreciated access to local green spaces since lockdown began. 74% of respondents agree there should be new laws to better protect nature and over 50% of people would now vote for a political party that invests in nature-rich green spaces.

Various jurisdictions which have been affected by the coronavirus pandemic are now pledging funds towards a "Green Recovery". For example, in England, a £40m fund has been established to support 'shovel-ready' environmental projects. A similar multi-Departmental fund in Northern Ireland could help create opportunities for blue and green infrastructure, sustainable tourism, nature restoration, mitigate against climate change and help progress other key Executive priorities. NIEL welcomes the Department for Infrastructure's commitment to £20m for Green and Blue infrastructure in June 2020 and the £2.8m funding for greenways announced on 16th September. These are steps in the right direction, however, more action will be required.

We agree that a green recovery plan should benefit the environment, communities and the economy – these do not exist in isolation but are interlinked.

We concur with the proposed priorities identified within the Policy Consultation Paper:

- The growth of the Greenway network across Northern Ireland
- Improved cycling networks across Northern Ireland
- Local government proposals around home energy retrofitting
- Continued growth of the local renewable energy sector
- Expansion of recycling waste management

In addition, we propose:

- Additional funding for green and blue infrastructure throughout NI
- The creation of new Active Travel Hubs (much like at C.S. Lewis Square)
- Measures to encourage uptake of public transport (of particular importance given the drop in passengers as the result of coronavirus)
- Investment in the EV charging network and encourage the uptake of low emissions electric and hybrid vehicles through a range of incentives

[1] https://community.rspb.org.uk/getinvolved/b/steppingupnorthernireland/posts/new-poll-shows-strong-public-support-for-a-green-recovery

NIEL believes that investing in a sustainable, resilient, low and ultimately zero carbon, green economy will help to create a bigger, better and more resilient ('future proofed') economy that is better able to meet the demands of a changing society. This is a view that has been endorsed by many prominent organisations. It is also essential to remember that investing on a more sustainable future by developing a green economy is likely to generate greater economic benefits for Northern Ireland in the long run. This is supported by the findings of the United Nations UNEP Green Economy Report (GER)[2] that

"*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*"

The case for developing a green economy was made in the House of Commons Environmental Audit Committee in its "A Green Economy"[3] report which said

"*The whole economy needs to be green and traditional sectors of the economy will need to be transformed"*

The CBI and its members describe the recovery from the COVID-19 pandemic as a real opportunity to build back better and pivot towards the low-carbon, sustainable, and net-zero aligned economy that we know we need[4]. Amongst other things the CBI called for government action to: "*Accelerate the deployment of low-carbon electricity generation and investment in grid system flexibility*" and "*Deliver jobs and energy savings by retrofitting homes and buildings to be more energy efficient and switch to low-carbon heating*."

[2] https://wedocs.unep.org/bitstream/handle/20.500.11822/22026/GER_summary_en.pdf?sequence=1&isAllowed=y

[3] House of Commons Environmental Audit Committee A Green Economy Twelfth report of session 2010-12 Volume 1 HC1025
https://publications.parliament.uk/pa/cm201012/cmselect/cmenvaud/1025/1025.pdf

[4] Achieving Net-Zero the government decisions needed to deliver a green recovery
https://www.cbi.org.uk/media/5579/cbi-green-recovery-roadmap.pdf

In June 2020 the UK Climate Change Committee[5] recommended five clear investment priorities in the months ahead for building a resilient economy, the first one of which was investing in improving the energy efficiency of homes. The five priorities identified by the CCC were:

- Low-carbon retrofits and buildings that are fit for the future
- Tree planting, peatland restoration, and green infrastructure
- Energy networks must be strengthened
- Infrastructure to make it easy for people to walk, cycle, and work remotely
- Moving towards a circular economy.

A HSBC evaluation[6] 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*."

[5] https://www.theccc.org.uk/publication/reducing-uk-emissions-2020-progress-report-to-parliament/

[6] HSBC A Climate for Recovery Climate Change Global February 2009 https://www.globaldashboard.org/wp-content/uploads/2009/HSBC_Green_New_Deal.pdf

Infrastructure Structures & Financing

1. Should an overarching delivery body be created in Northern Ireland to oversee all aspects of infrastructure delivery? what model should such a body potentially have?
2. What should the future role of the private sector be in infrastructure projects in Northern Ireland?
3. As public spending becomes increasingly constrained, what alternative methods of finance should be considered to invest in local infrastructure projects?
4. How can we ensure the City and Growth Deals across Northern Ireland encompass the widest audiences?
5. Should more fiscal powers be devolved to the Northern Ireland Executive? and how could the Executive expand its borrowing capabilities?
6. Should the PWLB be extended to Northern Ireland and how should this be developed?

NIEL supports the development of an independent Infrastructure Commission for NI to take strategic decisions. Following the recommendations from the Expert Panel brought together by the Infrastructure Minister, the Infrastructure Commission should:

- Set a long term (30+ years) vision for NI
- Be independent of Government and hold Government to account
- Be adequately resourced
- Advise on all aspects of NI infrastructure
- Include a focus on climate change
- Engage with stakeholders and the public

Digital Infrastructure

1. What is your current view of the digital infrastructure across Northern Ireland?
2. How will the introduction of 5G technology impact our economic development?
3. What is the most effective way to deliver continuous improvement in this area of infrastructure?
4. Are there alternative means of financing this network?
5. The need to address remaining gaps in broadband coverage across Northern Ireland and this is financed, both initially and continuous improvements.
6. Ensuring local businesses, principally SMEs, maximise their digital potential.
7. Will finance continue to be made available by both the Executive and UK Government to ensure NI benefits from the latest digital technologies?
8. Are we heading towards greater alignment with the ROI in terms of digital infrastructure, especially from an economic development perspective?
9. How will need to expand our digital infrastructure if work patterns are changed as a result of the COVID-19 situation, and remote working becomes more common?

Digital infrastructure across Northern Ireland has improved significantly in recent years, particularly in urban areas – the majority of which can now avail of "superfast broadband" (at least 30mbps download speed), "ultrafast" fibre broadband (at least 300mbps download speed) is also on the rise. However, according to an Ofcom report in December 2019[7], much work is needed to bring rural areas "up to speed".

NIEL would advocate for improvements to telecommunications insofar as it can enable remote working/working from home – this has been of particular importance in recent months due to coronavirus lockdown. Many people are unable to travel to their place of work and have had to rely on their personal broadband connection – this has presented difficulties for those living in rural areas.

Longer term, an improved telecommunications network will have a positive knock-on effect for transport emissions as fewer people will be required to travel to and from their place of work. Furthermore, improved ICT infrastructure could create more opportunities for business, online/distance learning, as well as facilitate low-carbon networking via conference calls, webinars etc which negate the requirement for people to be "physically present" at events or meetings.

By working closely with Openreach it will be possible to monitor broadband speed across NI and identify and map out areas of need. Rural communities in particular suffer from poor download and upload speeds (below 10mbps and 1mbps respectively) due to the lack of infrastructure and should be prioritised. Rolling out fibre optic cable within these areas will help address the technological split between rural and urban communities.

[7] https://www.ofcom.org.uk/about-ofcom/latest/media/media-releases/2019/latest-northern-ireland-broadband-and-mobile-coverage-revealed

Road Infrastructure

1. What areas of the existing network require significant investment within the next five-to-ten years?
2. How best can we develop a new strategy which better accommodates motor vehicles and cyclists on roads?
3. What is your opinion on the introduction of road charging?
4. What other innovative approaches to finance should be considered in this area?
5. How can we best strategically develop the Greenway network across Northern Ireland?
6. Whilst there has been debate on 'green mobility' within urban communities, how can we ensure it reaches everyone in Northern Ireland?

As mentioned in the consultation paper, we agree that there is a need to "expand the public transport bus fleet and shift to alternative energies". Priorities for the next 5-10 years should also include the creation of new cycle lanes and greenways, rolling out the Glider service to North and South Belfast, improved linkages to rail and bus stations and upgrades to the rail network – including extending the railway line to Armagh City and Strabane.

According to the Department for Infrastructure's 2018 Travel Survey just 5% of all journeys in NI are made by public transport. More than 70% of all journeys in NI are by car and many of these are single occupant journeys. During "rush hour", as much as one fifth of all journeys are parents doing the school run, despite the fact that most primary school children live within one mile of their school. Transport spending in NI is disproportionately higher for roads than all other forms of travel and this has enabled the car to dominate our transport. According to the National Audit Office[8] , 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 believes we need to focus on moving people, not vehicles around our towns, cities and rural places and 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 is also crucial to delivering sustainable, low carbon solutions for connected infrastructure across Northern Ireland and can create significant

[8] National Audit Office Investigation into devolved funding
https://www.nao.org.uk/wp-content/uploads/2019/02/Investigation-into-devolved-funding.pdf

economic, social and environmental benefits, and should receive greater support from the NI Executive.

In Sustrans' recent Bike Life report[9], 78% of people were in favour of taking space away from cars and creating space for walkers and people on cycles. 65% were in favour of reducing speed limits on local roads.

To facilitate this change in focus, we need to promote public transport, walking and cycling, or "active travel", especially for short everyday journeys. Just 32% of the population reported walking for 20 minutes at least once a week. This can contribute to obesity, diabetes and poor mental health. This has a consequential impact upon our health service, which accounted for 44% of the NI budget in 2019. We should seek to improve cycling safety by investing in joined-up urban cycling networks, protected cycle lanes and secure cycle parking provision. Cycling commuters have been found to reduce their incidence of many serious illnesses by over 40%[10].

In addition to the clear economic benefits from investing in active travel it also offers positive outcomes not just for the environment through reducing transport emissions but also for the physical and mental health of people, especially in terms of reducing particulates and other air pollutants, which in turn has very positive economic benefits. This is illustrated by the findings of Cycling UK[11] that the average economic benefit-to-cost ratio of investing in cycling and walking schemes (active travel) is 13:1. By comparison, according to UK Department for Transport Road Investment Strategy: Economic analysis of the investment plan[12] the benefit-to-cost ratio for bypasses and link roads is 2:1. On top of that greenways can also offer opportunities for enhancing biodiversity.

We would generally be in favour of "road charging" as a means of reducing car use within our city centres – Belfast is currently considered one of the most congested cities in the UK[13]. By following the example of London's congestion charge, it will be possible to alleviate congestion, incentivise public transport and encourage active travel. Funds raised from road charges could be invested back into improved public transport services. London's congestion charge regime includes exemptions/discounts for hybrid and electric vehicles which have little to no negative effect on air quality. A supplementary scrappage scheme could also be implemented to assist with taking older high emissions vehicles off the roads.

Greenway networks should be developed by identifying existing green spaces – some of which are fragmented and will need to be connected as part of a wider

[9] https://www.sustrans.org.uk/media/5943/200228-bikelife19_belfast_v58_web.pdf
[10] https://www.bmj.com/content/357/bmj.j1456
[11] https://www.cyclinguk.org/campaigning/views-and-briefings/cycling-and-economy
[12] UK Department for Transport Road Investment Strategy: Economic analysis of the investment plan https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/411417/ris-economic-analysis.pdf
[13] https://www.belfasttelegraph.co.uk/news/northern-ireland/gridlocked-belfast-is-uks-sixth-worst-city-for-traffic-jams-38908678.html

network of walking and cycle trails. In considering new greenway projects, lessons can be learned from the Connswater[14] greenway and other recently developed networks which have proven to be very successful.

Alternative low carbon transport fuels in particular electric vehicles, 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 motion[15].

National Infrastructure and Regional Interconnectivity

1. What other interconnectivity priorities to national infrastructure are there for NI?
2. How can regional infrastructure interconnectivity issues involving other regions be identified and agreed and funded for action by the responsible devolved administration or national government?
3. What should be done to improve North Channel super highway?
4. What relationship should be developed with the National Infrastructure Commission by its NI counterpart?

We would generally be in favour of improving North/South and East/West connectivity. This should be achieved through leveraging additional investment into our public transport network and improving existing linkages.

South of Lough Neagh, the railway line does not extend any further west than Portadown – nor does it extend south at Derry/Londonderry. Whilst connecting Tyrone and Fermanagh to the railway line would require substantial investment, this work could be completed in phases – starting with connections to Armagh City and Strabane. This will create opportunities for businesses, generate local and external tourism and help take cars off the road thereby reducing emissions, improving air quality and reducing traffic congestion and noise pollution.

Regarding the "North Channel super highway", we would generally be in favour of a railway connection to Scotland (as per the Channel Tunnel) to reduce the dependency on ferry and aviation services to Scotland. We are not convinced that a road bridge would be beneficial for the environment, furthermore, it may be subject to closures due to bad weather and would create substantial two-way

[14] https://www.connswatergreenway.co.uk/sites/default/files/CCG%20%20Evaluation%20Report%202019%20FINAL.pdf
[15] https://web.stanford.edu/group/efmh/jacobson/Articles/I/sad1109Jaco5p.indd.pdf

traffic congestion between Larne and Belfast. The overall cost of such a proposal may mean it is not financially viable. We would therefore prioritise the development of public transport links across NI.

Regarding the National Infrastructure Commission, we would encourage collaboration and engagement with the Commission to facilitate sharing of information and advice. As noted above, the creation of an independent Infrastructure Commission in NI could considerably strengthen the relationship with the NIC, creating a stronger UK-wide infrastructure identity.

Water Infrastructure

The delivery of clean and safe water to NI households and businesses is one of the most important functions of NI Water and should be resourced appropriately. NIEL believes that our water infrastructure is in dire need of investment – to address the threat posed by climate change, to meet rising demand whilst ensuring that water is obtained efficiently, sustainably and with minimal impact upon our freshwater environment.

NI Water supplies approximately 576m litres of clean drinking water to households each day[16]. On average each person uses approximately 150 litres a day, with an estimated 95% of water delivered to our homes going down our drains. We also now use around 70% more water than we did 40 years ago[17]. This increase in consumption, paired with a very high volume of waste is unsustainable, especially in the context of projected climate change impacts. Water scarcity has already become a concern in recent years, with prolonged dry spells having a profound effect on supply – for example, in June 2018 a hosepipe ban was imposed throughout NI following a prolonged heatwave.

NIEL believes that the issues of metered water pricing and managing water consumption are closely related, where the former can be used as a control on the latter. However, pricing alone will not bring about the desired reduction in water usage – there is a need for the continued education of householders in NI on the best ways to conserve water and reduce use. In particular, we would welcome social media campaigns, radio and television advertisements to help educate the public on the value of this precious resource.

Furthermore, education efforts should continue to address the ongoing problem of inappropriate material or substances being flushed down the toilet or poured down drains. This could help to prevent blockages in the system which can be very costly to remedy.

NI Water should seek to avoid the creation of new and costly “hard infrastructure” where possible and instead use “soft engineering” or “soft infrastructure” involving the use natural capital and ecosystem services instead, particularly in relation to

[16] https://www.niwater.com/sitefiles/resources/pdf/reports/2019/2018niwaterdrinkingwaterqualityannualreport.pdf
[17] https://www.nienvironmentlink.org/cmsfiles/images/News%20Items/From-Souce-to-Sea.pdf

water management. A good example of the benefits of using ecosystem services is South West Water's Upstream Thinking project which works in eleven catchments across Devon and Cornwall, including in the Exmoor National Park, and aims to improve water quality, at source, by improved land management techniques to reduce soil and chemical run off in the upper reaches of rivers. According to SWW Upstream Thinking has a potential 65:1 payback ratio over 30 years if it delays or even avoids capital expenditure for building and operating traditional treatment works[18].

Another example of the soft engineering option is SuDs (Sustainable Drainage Systems) which can be a cost-effective option to reduce the volume of water entering our sewerage systems – and therefore reduce NI Water's expenditure on water treatment. NI Water should seek to promote tree-planting and greening of urban areas to help address the volume of surface runoff and lessen the impact of flooding. Collaboration with the Department for Infrastructure and local councils will be vital to delivering significant, strategic, catchment-level change.

Integrated Constructed Wetlands (ICW) hold considerable potential to reduce the volume of waste water requiring active treatment by NI Water. ICWs operate as "passive", low-maintenance systems which can regulate water through natural means. NI Water has already successfully trialled ICW at Stoneyford which was the first ICW in Northern Ireland and should consider rolling out this approach to other sites where feasible. ICWs are also very cost-effective offering capital cost savings of approximately 70% and Operation and Maintenance savings of 90%.[19] According to NI Water[20]

"ICWs are proven to be low-cost, low-energy and low-maintenance in nature, compared with traditional solutions."

[18] https://wwtonline.co.uk/features/moorland-project-delivers-multiple-benefits-

[19] https://www.landcareresearch.co.nz/uploads/public/Discover-Our-Research/Biodiversity/Restoring-wetland-ecosystem-functioning/Part_2_ICW_workshop_2016.pdf

[20] https://www.niwater.com/stonyford-integrated-constructed-wetlands

Energy Infrastructure

1. A programme of retrofitting properties, private and commercial, how can this be best achieved?
2. The role of the private sector in the power generation process?
3. Future incentives for energy efficiency – how can these be best achieved?
4. What does the future mix of renewables look like?
5. How best should Northern Ireland to the need for energy security?
6. How can micro-grid option be developed? What are the implications for wider energy strategy?
7. How can we best achieve 'affordable decarbonisation?'
8. How can we increase greater innovation into the local energy network?
9. Does the Inter-connector network remain central to our future energy strategy?
10. What is the future of the local renewable energy market in Northern Ireland?

In June 2020 the UK Climate Change Committe[21] recommended five clear investment priorities in the months ahead for building a resilient economy, the first one of which was investing in improving the energy efficiency of homes. The five priorities identified by the CCC were:

- Low-carbon retrofits and buildings that are fit for the future
- Tree planting, peatland restoration, and green infrastructure
- Energy networks must be strengthened
- Infrastructure to make it easy for people to walk, cycle, and work remotely
- Moving towards a circular economy.

The CBI has also called for government action to

"*Deliver jobs and energy savings by retrofitting homes and buildings to be more energy efficient and switch to low-carbon heating*."

The Institute for Public Policy and Research[22](IPPR) has concluded that greater investment in a green recovery and clean, low-carbon jobs could create 1.6 million new jobs over the next decade, over 40,000 in Northern Ireland. The area where the next greatest number, over half a million (560,000), of those 1.6 million jobs could be created is in energy efficiency, which is currently the responsibility of the Department for the Economy, though this policy would also be relevant to the Department for Communities which is responsible for fuel poverty, DAERA which is responsible for climate change, the Department of Finance which is responsible for building regulations and also the Department of Health in terms of the positive

[21] Climate Change Committee Reducing UK Emissions 2020 Progress Report to Parliament June 2020 https://www.theccc.org.uk/publication/reducing-uk-emissions-2020-progress-report-to-parliament/

[22] Carsten Yung and Luke Murphy IPPR Transforming the economy after Covid-19 A clean, fair and resilient recovery July 2020 https://www.ippr.org/files/2020-07/transforming-the-economy-after-covid19-july2020.pdf

impacts on physical and mental health of taking people out of fuel poverty. The IPPR also found that without government intervention, unemployment could rise by more than 2.1 million to almost 10% of the workforce.

It seems clear therefore that retrofitting energy efficiency measures in buildings (domestic and commercial) should be one of the top priorities for the short to medium term future and improving building regulations will be an essential part of that.

To date wind has been the dominant source of renewable electricity generated in Northern Ireland and it is likely to remain that way for the foreseeable future. According to the Department for the Economy[23] 84.8% of all renewable electricity generated within Northern Ireland over the 12 month period July 2019 to June 2020 was generated from wind. This compares to 85.3% for the previous 12 month period (July 2018 to June 2019). However, NI needs a combination of renewable energy sources including wind, solar, marine (tidal and wave), biomass and biofuel options to reduce our greenhouse gas emissions to the level the evidence makes clear is necessary to avoid an increase in global average temperature of no more than 1.5^{o}C above the pre industrial average, but one aspect of energy that really must be at the forefront of the plan for a net zero carbon future is for a much greater reduction in energy demand and energy efficiency (the more efficient use of the energy that is consumed).

The importance of energy efficiency was clearly highlighted by DETI[24] (the predecessor of the Department for the Economy) which said that

"*Reducing overall energy demand offers the potential for the most social, environmental and economic gains*"

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 savings[25].

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

[23] https://www.economy-ni.gov.uk/articles/electricity-consumption-and-renewable-generation-statistics
[24] DETI "Delivering Northern Ireland's 1% Energy Efficiency Target An Overview"
[25] Policy and Innovation Unit http://www.gci.org.uk/Documents/TheEnergyReview.pdf

thirds of the energy generated wasted before it even reaches the consumer. Decentralised energy also offers opportunities to save energy. As the Whitty report (2012)[26] said

"*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 regards energy security, this also requires a multi-faceted approach. Reducing our overall energy demand as referred to above is an essential component of our efforts to increase energy security, along with greater energy storage and could save a huge amount of money. The potential for energy storage and other 'smart' options including interconnection and the management of demand was explored by the National Infrastructure Committee[27] which concluded that 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. Similarly, according to The Carbon Trust[28], "*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.

As regards the role of interconnection, it is important as it can not only increase the security of supply through imports but allow exports and facilitate an increased amount of intermittent electricity (primarily from wind power) on to the grid. NIEL notes the recent decision by the Minister for Infrastructure to give the go ahead for the second North-South Interconnector, which, according to Eirgrid[29] "*will help to improve the efficiency of the electricity system, reducing costs and ultimately saving money for the end user, the electricity customer.*"

True and full energy security is only likely to be achieved if and when Northern Ireland eliminates the use of fossil fuels and is completely powered by indigenous renewable energy sources. An important aspect of this will also be the nature of our energy investment from this point on and the need to divest from fossil fuel investments.

NIEL would challenge the use of the term 'affordable decarbonisation' which we

[26] http://www.consumercouncil.org.uk/filestore/documents/Lord_Whitty_Report.pdf

[27] 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

[28] https://www.carbontrust.com/media/672486/energy-storage-report.pdf

[29] http://www.eirgridgroup.com/the-grid/projects/north-south/the-project

believe to be a misnomer. Indeed, the AERA Minister said in the course of the debate in the Assembly in February 2020[30] that

"*Action to reduce our greenhouse gas emissions and adapt to our changing climate should not be viewed as a burden but as an opportunity, and we need to create a stronger, prosperous and more sustainable green low-carbon economy and enhanced natural environment for everyone*."

There is no doubt that decarbonisation will require investment. For example, the Climate Change Committee described the cost of achieving net zero carbon by 2050 for the UK at around 1-2% of GDP, the same cost as meeting the previous target of an 80% reduction in greenhouse gas emissions by 2050. However, the benefits versus costs of tackling climate change was made very clear by the 2006 Stern Review[31] which said that

"*if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more.*

In contrast, the costs of action – reducing greenhouse gas emissions to avoid the worst impacts of climate change – can be limited to around 1% of global GDP each year."

The Stern Review also states that climate change must be regarded as market failure on the greatest scale the world has seen.[32]

Not investing in decarbonisation will bring much greater costs in economic, environmental and social terms and as such NIEL would say that we cannot afford to not decarbonise. As such all decarbonisation is affordable as it is essential.

On top of that many studies have made clear the many economic and social benefits that are likely to result from greater investment in decarbonisation, some of which have already been referred to in this response. In addition to the IPPR research referred to above, which showed that greater investment in a green recovery and clean, low-carbon jobs could create over 40,000 in Northern Ireland, research by the National Grid[33] 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

[30] http://aims.niassembly.gov.uk/officialreport/report.aspx?&eveDate=2020/02/03&docID=292480
[31] https://webarchive.nationalarchives.gov.uk/20100407163608/http://www.hm-treasury.gov.uk/d/Summary_of_Conclusions.pdf
[32] https://webarchive.nationalarchives.gov.uk/20100407172546/http://www.hm-treasury.gov.uk/d/Chapter_2_Economics_Ethics_and_Climate_Change.pdf
[33] National Grid Building the net zero energy workforce January 2020 https://www.nationalgrid.com/document/126256/download

13,700 jobs will be needed in Northern Ireland. Given that according to the Department for the Economy, the low carbon and renewable energy (LCRE) economy in NI generated £2 billion in 2017 - £1.2 billion directly and £800 million indirectly and approximately 11,700 FTE jobs with an even 50/50 split between direct and indirect jobs[34] then based on the research by the National Grid referred to above, it is clear that investing in a green, low carbon recovery offers NI the possibility to more than double the number of jobs in the LCRE sector. NIEL believes this is an opportunity that must be taken.

As regards increasing innovation, NIEL believes that one of the most important steps in supporting and driving innovation is to set the right long-term policy, which includes providing financial support for research and development. The London School of Economics Grantham Research Institute and the Centre for Climate Change Economics and Policy[35] reached a similar conclusion when it said

"*The key issue preventing a rebound in investment is a lack of confidence to invest rather than a lack of liquidity*."

Introducing a Climate Change Act for NI with appropriate targets and making a firm commitment to developing a sustainable, low and ultimately zero carbon economy for NI as we recover from the coronavirus would send a clear message to innovators, investors and entrepreneurs that NI is a good place for low carbon businesses. More than 200 companies have signed up to commit to being run on 100% renewable electricity (the RE100)[36] including many large multinationals[37]. If NI wants to attract companies who have committed to run on 100% renewable energy then NI needs to be able to readily provide large amounts of 100% renewable energy. It is clear that investing in renewable energy will make NI a more attractive option for companies like those in the RE100 and others that wish to reduce their impact on the world but if NI is not in a position to offer 100% renewable electricity then the chances of attracting that type of large multinational company is greatly reduced, if not eliminated. Committing to producing 100% renewable electricity is one step towards future proofing our economy.

Scotland has been very successful in decarbonising and part of that is the clear commitment of the Scottish Government through the domestic legislation and long term government policy. The Scottish Government has a target to generate the equivalent of 100% of Scotland's own electricity demand from renewable sources

[34] ONS Low Carbon and renewable energy economy, UK 2017 see Table 3 https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/finalestimates/2017#how-do-we-measure-the-low-carbon-economy

[35] The basic economics of low-carbon growth in the UK Romani M., Stern N. and Zenghelis D. 2011 http://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2014/03/PB_economics-low-carbon-growth_Jun11.pdf

[36] https://www.there100.org/companies

[37] The Companies include Allianz, Aviva, Bank of America, Barclays, BT, Carlsberg, Chanel, Citi, Coca-Cola, Danone, Danske Bank, Dell, ebay, Fujitsu, GM, Google, H&M, HSBC, Ikea, ING, JC Decaux, Johnson & Johnson, Kelloggs, Kering, Lego, Mastercard, McKinsey & Company, Microsoft, Morgan Stanley, Nestle, Next, New Balance, Nike, P&G, PWC, Rakuten, Sky, SONY, Tata Motors, Tesco, Tetra Pak, UBS, Unilever, Virgin, Visa, Vodafone, Walmart, Westpac and Zurich Insurance Group

by 2020. In 2019, 30.5 TWh[38] and the equivalent of 90.1% of gross electricity consumption (total electricity generation minus net exports) in Scotland was generated from renewable sources, rising from 76.7% in 2018[39]. In 2018, the low carbon and renewable energy (LCRE) sector directly supported 23,100 full-time equivalent jobs and generated £6.4 billion in Scotland[40].

The Growth of Hydrogen

1. How can we best build a hydrogen infrastructure in Northern Ireland, bringing together business, academia and other relevant parties?
2. What existing sectors have roles to play in developing this sector and how?
3. What opportunities exist for start-ups to move into this sector?
4. What financing methods are most appropriate for this sector?
5. How can this sector play a role in a wider 'Green Recovery' plan?

Hydrogen has a potentially exciting role to play in decarbonising transport and heating.

Hydrogen buses have been in use mainly in North America, in Chicago for example, since the 1990s[41]. One major advantage of hydrogen as a transport fuel is that the emissions from a hydrogen vehicle are water. This has the potential to significantly reduce air pollution from traffic in built up areas.

According to the UK Climate Change Committee[42]

"*Used selectively, alongside widespread electrification and improvements to energy efficiency, hydrogen has potentially valuable roles in replacing natural gas (e.g. for heating buildings on colder winter days, industrial process heat and back-up power generation) and liquid fuels (e.g. in heavy transport)*."

In fact, the Climate Change Committee concluded that

"*The largest potential for hydrogen to contribute to decarbonisation is as a low-carbon fuel for heat in buildings and/or industrial processes*."

Another positive aspect of hydrogen as a fuel is that it can be produced by electrolysis of water using renewable electricity, for example from wind power generated at off peak times such as night time. This also has the advantage of using wind power that might otherwise have been constrained (paid to not produce electricity) at times of surplus.

[38] https://scotland.shinyapps.io/sg-scottish-energy-statistics/?Section=RenLowCarbon&Subsection=RenElec&Chart=RenElecGen
[39] https://scotland.shinyapps.io/sg-scottish-energy-statistics/?Section=RenLowCarbon&Subsection=RenElec&Chart=RenElecTarget
[40] https://scotland.shinyapps.io/sg-scottish-energy-statistics/?Section=RenLowCarbon&Subsection=LowCarbonEconomy&Chart=LowCarbonEconomy
[41] https://www.hydrogeneurope.eu/hydrogen-buses
[42] https://www.theccc.org.uk/wp-content/uploads/2018/11/Hydrogen-in-a-low-carbon-economy.pdf

Hydrogen should have an important role to play in a greener, low carbon economy. However, as the Climate Change Committee said[43]

"*If hydrogen is to play a substantial long-term role, progress towards deployment of low-carbon hydrogen at scale must start now*"

This relates back to the points about innovation, energy security, financing a green recovery and the need for the right long-term policies to be put in place to attract investors and innovators. Given the abundance of wind in Northern Ireland and the potential to produce low-cost electricity from wind this should lower the production costs of hydrogen by electrolysis.

[43] https://www.theccc.org.uk/wp-content/uploads/2018/11/Hydrogen-in-a-low-carbon-economy.pdf