

Durham Energy Institute response to Prime Minister's 10 point plan for a Green Industrial Revolution

Summary

Durham Energy Institute (DEI)¹ is the hub of energy research at Durham University, delivering integrated solutions for the climate emergency.

DEI welcomes the Green Industrial Revolution 10-point plan with its emphasis on supporting zero-carbon solutions, 'Levelling-up' and creating green jobs in the North.

Together with the four Faculties comprising Durham University, we are developing a long-term green job strategy including future programmes and changes to current courses, which will support this plan.

DEI are leading on a wide range of Regional and National initiatives on offshore wind, hydrogen, deployment of CCS, large-scale decarbonisation of heating, delivery of new energy materials and meeting society's demand for affordable, secure and sustainable energy provision. We offer our support to the new Zero Carbon Taskforces.

Key points from the DEI response include:

- Government commitment to hydrogen will stimulate the additional financial and commercial investment required to make crucial energy system resilience and security of supply a reality.
- The offshore wind targets are ambitious but achievable as long as there is investment in developing port infrastructure and installation vessels and techniques.
- We are delighted at the introduction of an enhanced standard for new buildings and note that this will also require an enhanced energy and transport infrastructure, and continuation of Renewable Heat Incentives. DEI are leading on a wide range of decarbonising heating initiatives and offer their support to the new Zero Carbon Taskforce.
- We also welcome the emphasis on levelling-up, creating high quality jobs and opportunities for disadvantaged areas in the North of England to support UK-wide sustainability. **Dr. Andrew Wright, Durham University Professor in Practice and former Director at Ofgem** said: *"It is essential the 10 point plan puts society and justice considerations at the forefront"*. **Professor Jon Gluyas, Executive Director of Durham Energy Institute**, said: *"North of England..is exceptionally well placed to benefit from the Green Industrial Revolution in terms of workforce, world-class universities, existing expertise, resources and innovative drive to enable a smooth transition into green jobs"*

¹ <https://www.durham.ac.uk/dei/> **Durham Energy Institute (DEI)** is the hub of energy research at Durham University. It unlocks research synergies between different disciplines and sectors to tackle the energy demands of the future. Producing world class research for understanding energy decarbonisation issues across science and society and delivering integrated solutions for the climate emergency.

DEI Response to Government Green Industrial Revolution Plan

Durham Energy Institute welcomes the news from the UK Government on the 10 point plan for the green revolution and its emphasis on ‘Levelling-up’. With partners in NE England and beyond we are already leading innovation and opportunity in offshore wind, hydrogen for transport, industry and the domestic markets, deployment of CCS, large-scale decarbonisation of heating, delivery of new energy materials and meeting society’s demand for affordable, secure and sustainable energy provision. The government’s announcement will enable acceleration in the delivery of a net-zero economy and will stimulate the additional financial and commercial investment required.

Professor Jon Gluyas, Executive Director of Durham Energy Institute, said:

“We welcome the Prime Minister’s ten point plan for a green industrial revolution and the emphasis on creating high quality jobs and opportunities for disadvantaged areas in the North of England to support UK-wide sustainability. Given it’s long association with energy and key role in the first Industrial revolution this Region is exceptionally well placed to benefit from the Green Industrial Revolution in terms of workforce, world-class universities, existing expertise, resources and innovative drive to enable a smooth transition into green jobs². Durham Energy Institute is working with regional and national partners from industry, government and academia on many initiatives which support this vision and the UK’s path to net zero”.

Offshore Wind

Durham Energy Institute is an academic leader in offshore wind. We have a long-term strategic partnership with Ørsted which is spearheading global development and deployment of offshore wind. We are also key partners in two of the leading Offshore Wind Regional clusters – Aura in Humberside and Energi Coast in North East of England³.

Professor Simon Hogg, Chair of the Energi Coast Innovation Group said:

“We are delighted with today’s Government announcement of their 10 point plan for the ‘green industrial revolution’. Offshore wind and hydrogen are two key elements on the agenda which have huge roles to play in decarbonising our energy system, through the integration of electricity generation from renewable sources. The target to quadruple offshore wind installed capacity to 40GW by 2030 which will produce enough electricity to power every UK home, is ambitious but achievable. This is an increase of 10 GW over the previous target from the time of the Government’s Sector Deal for offshore wind in 2018. The largest offshore wind turbines that are currently operating in UK waters each generate 8 MW of electric power, although the industry is progressing rapidly and turbines with 50% greater capacity than this are now very close to deployment. A rough calculation shows that delivering the 40GW vision would mean installing just under four thousand 8 MW turbines, or roughly one turbine each day from now until 2030. This is a big ask, but when you consider the rapid rate of growth in the Sector and the fact that there are currently over 2000 offshore wind turbines operating in UK waters, the target seems less of a stretch. Arguably the most significant bottle neck in delivering the ambition is not the manufacturing of the turbines, but the investment needed in developing port infrastructure and installation vessels and techniques will be mandatory for such large scale deployment.

The progress that we have seen in offshore wind has been as a result of sustained commitment to the Sector by several of the UK’s recent Governments and it is wonderful to see this commitment

² DEI response to BEIS Committee inquiry on Post-pandemic economic recovery (Oct 2020)
<https://committees.parliament.uk/writtenevidence/10011/pdf/>

³ Find out more about Durham Energy Institute Wind energy partnerships and research at
<https://www.durham.ac.uk/dei/research/wind/>

continuing to 2030 and beyond. An increased focus on energy storage is essential for the integration of the planned expansion in offshore wind into our energy system. Hydrogen and CCS have much to offer here as enabling technologies for storage. Their inclusion in the 10 point plan alongside offshore wind opens the door to supercharging our transition to a zero-carbon future. Bringing the same commitment to these areas and an emphasis on regional-clusters to support economic growth from the Sector Deal, will benefit the whole of the UK and make a significant contribution to the Governments 'Levelling-Up' agenda."

Hydrogen & CCS

Professor Tony Roskilly and his research team are leading national research networks for Hydrogen Fuelled Transportation – Network-H2 and Decarbonising Heating and Cooling⁴. They are developing hydrogen fuelled transport powertrains, CHP and integrated energy hubs, as well as research on the utilisation of captured CO₂. He is the Academic Lead for the Teesside Industrial Cluster which is at the forefront of demonstrating hydrogen and CCS development. Tees Valley have ambitious plans to decarbonise industry and transport by exploiting the benefits of hydrogen and CCUS. This includes the Net Zero Teesside CCUS project⁵ and establishing the National Hydrogen Transport Hub and the Tees Valley Net Zero Innovation Centre. We are working with Tees Valley Combined Authority, NEPIC, PD Ports, MPI, TWI, Northern Gas Networks, Teesside University and other regional stakeholders to support all the decarbonisation and clean growth agenda.

Professor Tony Roskilly said:

"This is a very positive and encouraging announcement made by the Government. For all scenarios to decarbonise UK domestic, commercial and industrial heating by 2050, hydrogen is set to play an important role. There is also the opportunity to decarbonise road, rail, air and sea transport modes through the use of hydrogen and hydrogen carriers, such as ammonia and synthetic liquid fuels. Advances currently being made in UK hydrogen research and infrastructure development support the Government's plans for hydrogen. We are supporting Northern Gas Networks, National Grid Gas Transmission and others in their work to understand the challenges of distributing hydrogen through our national gas network and using it safely in a wide range of transport, buildings and industrial applications.

We should not forget that the gas itself and the network as a whole provides an enormous store of energy. Coupling this with potential use of offshore wind and other renewable power to produce green hydrogen not only supports decarbonisation but could provide crucial energy system resilience and security of supply. The government commitment to hydrogen will accelerate developments and will stimulate the additional financial and commercial investment required to make this a reality."

Greener Buildings

Durham Energy Institute have established the Durham Heat Hub⁶, jointly with Durham County Council to accelerate the dissemination and implementation of low carbon heating in residences and buildings across the County. DEI also leads on geothermal in the NE and UK as a whole and is

⁴ Further information on Network-H2 and Network for Decarbonising Heating and Cooling can be found at <http://www.net-zero-research.co.uk/>

⁵ www.netzeroteesside.co.uk

⁶ Durham Heat Hub <https://durhamheathub.com/>

working closely with The Coal Authority on decarbonising heat for domestic and other buildings by way of using the heat contained in flooded and abandoned coal mines. Two mine energy projects currently under development in the North East are anticipated to supply low carbon heat to 2400 homes and other commercial buildings within the next year or so, demonstrating the potential for heat decarbonisation at scale in former mining areas. The national-scale potential means that up to 25% of domestic properties could use this zero-carbon heat source.

Along with our leadership of the national Decarbonising Heating and Cooling network and other decarbonising heat initiatives, we are well positioned to support the Government Zero Carbon Taskforce in this area and would be happy to contribute our resources and expertise in support of their activities.

We welcome the introduction of an enhanced standard for new buildings and the commitment to ban gas boilers in new homes by 2023. An enhanced energy and transport infrastructure will also be required to support these developments. We hope to see this need reflected in coordinated infrastructure planning across Government Departments, with mutually supportive programmes to assure smooth delivery.

Most of our building stock will still be existent in 2050 and retrofit will be essential which also requires strong policy and financial support. Improving building fabric performance through enhanced energy efficiency measures is essential before integrating low carbon energy systems. Our recent project, Solid Wall Insulation Innovation has demonstrated that substantial savings can be made with insulation and smart energy efficiency tools. If we are to adequately address existing stock this support will be required over a much longer term in order to achieve the transition. We welcome the inclusion of private sector landlords within these plans.

There are also recognised restrictions in the capacity and capability of the supply chain to procure, supply and install the Air Source Heat Pumps identified within the plan. There is an urgent need for upskilling and recruitment into this emerging market⁷. Again, longer term surety of investment will assist in employers entering this market.

Renewable Heat Incentives (RHI) are not directly mentioned in the plan. These green investment incentive schemes should be extended over a period of several years to allow these projects to be delivered, recognising that projects of this nature can take 2-3 years to develop before construction commences. RHIs are essential and need to be retained until heat markets develop.

Levelling-up and Just Transition

Given the scale and urgency of the changes required to how we live our lives, it is important to stay focused on the need to ensure that the benefits of the transition to a low carbon economy can be shared by all. It is essential that new policies, technologies and systems for decarbonisation which are implemented are socially inclusive. Key issues are to ensure that 'green' energy is affordable and does not disadvantage poorer households and to ensure that the new 'green' jobs that are created are high quality jobs with accessible training for lower skilled workers⁸.

Andrew Wright, Durham University Professor in Practice and former Director at Ofgem said: "It is essential that the 10 point plan puts society and justice considerations at the forefront. Previous approaches have often been economically regressive, which reduces public acceptance and

⁷ [BEIS Committee inquiry on Post-pandemic economic recovery Durham Heat Hub response](#) (Oct 2020)

⁸ Abram, S et al (October 2020) 'Just Transition Pathways to Socially Inclusive Decarbonisation' Durham Energy Institute co-led COP26 Universities network briefing
<https://www.durham.ac.uk/resources/dei/briefs/COP26JustTransitionPolicyPaper-Final.pdf>

creates a false narrative between decarbonisation and affordability. I fear there is an emphasis on business as usual approaches, using low carbon substitutes, rather than thinking about how society and the energy system might change and adapt to a low carbon world. Simply substituting elements of the current system with the low carbon equivalent will inevitably be more expensive and would be a missed opportunity. More generally, there is the challenge of how the fixed and historic (sunk) costs of the system are recovered, given these will become a greater proportion of the cost base in a low carbon system. There is a lot of discretion about how this might be done, and social and economic justice should be at its heart alongside economic efficiency and the avoidance of distortion.”

Transforming our energy system

It is essential that plans going forward have a greater emphasis on the need for an integrated, multi vector system, combining multiple low-carbon solutions. Recognising that the drive for net zero is not just a question of plugging low carbon elements into the existing system but requires fundamental systemic change. In particular, it is surprising that there is little in the plan regarding smart / digital technology to enable system flexibility and managing energy demand. In a similar vein, there is a focus on large scale, top down solutions rather than any emphasis on local and community energy. District heating at the local level is also not mentioned, which could be an important facilitator of heat decarbonisation.