

A CLIMATE FOR CHANGE

How the North of England
can be at the forefront of
the green revolution



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A CLIMATE FOR CHANGE: EXECUTIVE SUMMARY

The UK was the first to demonstrate climate leadership when, in June 2019, it committed to net zero emissions by 2050. The urgency of the climate emergency has since burgeoned.

Immediate attention shifted in 2020 to the COVID-19 pandemic, with the economy and society plunged into crisis. But the outbreak has also served as a catalyst to focus minds on a clean energy future, and the Prime Minister pledged to ‘build back better’ with green energy initiatives coming to the fore. A £160 million post-pandemic plan for green growth was announced by Boris Johnson in November 2020 which will create “hundreds of thousands of jobs” within the next decade. It is the first stage of a Ten Point Plan for what has been declared a green industrial revolution.

The Ten Point Plan for a Green Industrial Revolution offers a range of solutions to address current climate issues, with the move to boost hydrogen production being central to the proposal. The North of England is driving forward innovation in green infrastructure, and collaboration between government, industry and private business is already powering growth in a new hydrogen economy, underpinned by skilled job creation at a local level.

Northern Gas Networks is working alongside other gas distributors on pioneering pilot projects, such as HyDeploy and H21 that will demonstrate the safety and efficacy of a hydrogen transition for the existing natural gas networks of the UK.

Mindful of these developments, the purpose of this report is to capture current public attitudes around climate change and the shift to greener energy sources. It investigates the economic and environmental priorities and opportunities for post-pandemic recovery. Two YouGov surveys involving

more than 2,000 people collectively have been utilised to research a national perspective and the perspective of people living in the North of England.

Key findings from the national GB research tells us:

- Just 16% of people think that we will meet the net zero emissions target by 2050.
- Despite the immediate challenges associated with the pandemic, most people are as concerned about the environment as they were before the coronavirus outbreak (59%), or even more concerned (14%).
As a combined total, that represents nearly three quarters of the UK adult population (73%).
- 64% want to rebuild the economy in a way that is greener and better for the environment.
- More 18 to 24-year-olds in GB want the government to prioritise unlocking investment in green energy (20%) than on job creation (15%).
- Of those that said the UK should take the opportunity to rebuild in a way that is greener and better for the environment, more than a third (35%) think a green recovery will help to bring communities together.



The view from the North of England highlights that:

- A lack of commitment from business and industry to make change happen is the biggest concern for 43% of people in the North of England when asked about how the UK is responding to climate change.
- Lack of commitment from government to make policy decisions to achieve net zero (31%), along with the cost of change (31%), are also in the top three concerns.
- 45% of adults in Cumbria and 37% of adults in Yorkshire think that improving environmental education would help their region works towards the UK’s net zero carbon emissions target.
- Most think that large, privately owned businesses do underpin the local economy by providing employment (57%).
- The creation of job opportunities and skilled work, leading to a strong local economy, is the top priority for future investment for 19% of northern residents, compared with 33% in Cumbria and 25% in Northumberland.
- One-in-five people (22%) in The North think businesses are an anchor for the community and bring people together.
- 42% of Northerners consider hydrogen as a clean alternative to fossil fuels for heating homes and businesses. The H21 and HyDeploy initiatives will demonstrate this in 2021.

Sustainable action requires policy as well as technological innovation. The 2021 United Nations Climate Change Conference, COP26, due to be held in Glasgow in November 2021, provides a platform for the UK to demonstrate hydrogen leadership on a world-scale. This must be a government priority, supported by policy commitments that enable the UK to meet the net zero target:

- To accelerate investment in low-carbon energy for heating and cooking – stimulating innovation to develop alternative energy sources such as hydrogen and speeding up progress to develop the required technology.
- To establish national targets for local carbon hydrogen production.
- To grant regulatory approval to allow more hydrogen into the gas network and to reduce cost.
- To invest in the development and roll out of hydrogen-ready boilers to both domestic and commercial markets.

The paper balances survey data with insight from interviews from key industry experts from the North East LEP, Tees Valley Combined Authority, Leeds City Council, National Energy Action and West Yorkshire Combined Authority. Local communities that are being championed are also referenced throughout the paper.

Green growth presents opportunities for collaboration amongst Northern England’s policy shapers and national policy makers, and similarly can encourage collaboration within communities – strengthening community engagement.

Drawing from the experience of the industrial past, recommendations can be drawn:

- To prioritise green growth and new, skilled job creation in the regions hit hardest by the pandemic, many of which are in the North.
- To ensure industry has a role in helping to identify pathways and offers opportunities for young people and those upskilling.
- To ensure communities are engaged and involved in local initiatives – improving public confidence in climate action through demonstration and active public engagement.
- That businesses driving forward the green agenda commit to bringing together diverse groups and provide social support to vulnerable members of society.

Public support for a green recovery is strong. The UK can and will build back better from the pandemic through clean energy, nature-based solutions, and adaptation and resilience planning. Reaching net zero requires big, but achievable, changes, both to society and to the ways in which our economy can grow sustainably, enabling the needs of both the current and future generations to be met. As individuals, the concept of ‘think global – act local’ is relevant. As a government, the time is now to make the necessary policy commitments to enable strong regional and national advancement towards the net zero carbon emissions goal.

A CLIMATE FOR CHANGE: INTRODUCTION

In June 2019, the UK Government legislated for a target of net zero carbon emissions by 2050. The urgency of the climate emergency has since burgeoned, with natural disaster events around the globe - from the extreme flooding in the North of England to the bush fires in Australia - raising public awareness and the likes of Greta Thunberg, Sir David Attenborough and Extinction Rebellion helping to drive universal action on climate change up the political agenda.

Immediate attention shifted in 2020 to the COVID-19 pandemic, with the economy and society plunged into crisis. But the outbreak has also served as a catalyst to focus minds on a clean energy future, and the Prime Minister has pledged to 'build back better' with green energy initiatives coming to the fore. A £160 million post-pandemic plan for **green growth**¹ was announced by Boris Johnson in November 2020, which will create "hundreds of thousands of jobs" within the next decade. It is the first stage of The Ten Point Plan for a Green Industrial Revolution. This plan offers a range of solutions to address current climate issues including transport, nature restoration and renewable energy, with the move to boost hydrogen production being central to the proposal.

Mindful of these developments, the purpose of this report is to capture current public attitudes around the shift to greener energy sources and what the economic and environmental priorities and opportunities are for post-pandemic recovery.

METHODOLOGY

The primary research for the report has been gathered through YouGov surveys, conducted using an online interview administered to members of the YouGov GB panel of 185,000 individuals. An email was sent to panellists, who are targeted respondents in the right demographics, to produce a sample representative of the overall publication, inviting them to take part in the survey and providing a link to the same.

Two YouGov surveys were conducted: a national survey and a bespoke northern England sample, involving more than 2,700 people in total. The figures have been weighted and are representative of all adults (aged 18+) in the respective areas. The national survey sample size was 1,773 adults, whilst the northern England sample size was 1,021 adults, with fieldwork undertaken between 19th - 25th August 2020. Please note, the northern sample covered residents within Northern Gas Networks' regions (the North East of England, northern Cumbria, North and West Yorkshire, and parts of East Riding and South Yorkshire) and is referred to as 'The North' and 'northern' for the purposes of this report.

The qualitative research interviews were conducted between 1st – 22nd October 2020 over Microsoft Teams. The interviewees include:

Andrew Clark, Energy Programme Lead at the **North East Local Enterprise Partnership**²

The North East Local Enterprise Partnership (North East LEP) is a public, private and education sector partnership. The partnership is one of 38 LEPs in the country and is responsible for promoting and developing economic growth in the local authority areas of County Durham, Gateshead, Newcastle, North Tyneside, Northumberland, South Tyneside and Sunderland.

Sarah Tennison, Technology and Innovation Manager

at **Tees Valley Combined Authority**³

Tees Valley Combined Authority was created in 2016 to drive economic growth and job creation in the area. A partnership of five authorities; Darlington, Hartlepool, Middlesbrough, Redcar & Cleveland and Stockton-on-Tees, the Combined Authority works closely with the Local Enterprise Partnership, wider business community and other partners to make local decisions to support the growth of the regional economy.

Neil Evans, Environment Director at **Leeds City Council**⁴

Leeds City Council is the local authority for the city of Leeds, West Yorkshire. It is responsible for providing all statutory local authority services in Leeds, except for those it provides jointly in conjunction with other West Yorkshire Authorities. These include education, housing, planning, transport and highways, social services, libraries, leisure and recreation, waste collection, waste disposal, environmental health and revenue collection.

Helen Stockton, Chair of **National Energy Action**⁵

National Energy Action is a fuel poverty charity that works to eradicate fuel poverty and campaigns for greater investment in energy efficiency to help those who are poor or vulnerable to gain affordable heat.

Simon Pringle, Chair of the **Leeds City Region LEP Green Economy Panel**⁶

The West Yorkshire Combined Authority Green Economy Panel was created in 2016 to achieve a substantial and continued decrease in carbon emissions, while also increasing economic output and employment. The Combined Authority comprises of the West Yorkshire local authority areas of Bradford, Calderdale, Kirklees, Leeds and Wakefield, plus the City of York.

The interviews were recorded and representative quotes from interviewees are presented in the narrative below.

ABOUT THE AUTHOR

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Matthew holds a PhD in Environmental Science (University of East Anglia), an MSc in Social Research Methods (Teesside), and a BA in International Studies and Political Science (Birmingham). His research interests lie in the social and ethical dimensions of environmental issues. In particular, he researches issues of environmental justice and the role of public and stakeholder participation in energy and environmental policy.

ABOUT NORTHERN GAS NETWORKS

Northern Gas Networks (NGN) delivers gas to 2.7 million homes and businesses across the North East, northern Cumbria and most of Yorkshire through a network of underground pipes. NGN transports, but does not produce, natural gas. It remains **committed to sustainability**⁷ by reducing waste and minimising both the business carbon footprint and emissions from the network of pipes. It aims to **reach net zero**⁸ in its carbon footprint - in its energy usage, fleet, business mileage - by 2031 and is developing the sustainability of gas network assets in design, operation, maintenance and decommissioning. NGN is undergoing a process of replacing old gas mains with 3,800 kilometres of newer, modern alternatives to futureproof the network for the next 100 years. This investment will enable NGN to run zero carbon gases throughout its network.



NET ZERO, COVID-19 AND THE ROLE OF HYDROGEN HELPING THE UK TO BUILD BACK GREENER

NET ZERO

The urgent threat of climate change means that everyone, from citizens to businesses and government organisations, must work to lower carbon dioxide emissions into the atmosphere. The UK Government has pledged to reach net zero emissions by 2050, meaning that no more carbon goes into the atmosphere from the activities of the UK economy than can be taken out.

A **YouGov survey**⁹ of 2,005 UK adults in 2018 found strong evidence of concern for issues around climate change action from government and businesses in the fossil fuel sector, with more than three-in-five feeling that the Government was not doing enough in preparing for and adapting to climate change.

To date, there has been significant investment in the transition to low-carbon electricity systems. For example, in October 2020 the UK Government announced **£160 million support for renewables**¹⁰ with an emphasis upon offshore wind energy. However, there has been much less investment in support of important work to decarbonise other energy uses, including for heating and cooking.

The Committee on Climate Change tracks government progress towards meeting its legally binding climate change goals. It reports strong progress **in decarbonising the electricity sector**¹¹, however decarbonising transport, heating and cooking has received considerably less policy attention and progress has remained slow.

Rapid action across a range of economic sectors is therefore vital to meet net zero carbon goals by the middle of the century.

THE IMPACT OF COVID-19 ON EMISSIONS

The COVID-19 pandemic and climate change are two global crises running in tandem.

Lockdowns and restrictions of movement enforced by governments in the fight against the pandemic saw the European Union's daily emissions **drop by 60%**¹² between March and June 2020. **The correlation sparked debate about how the pandemic, lower emissions and climate change are linked.**¹³

However, an article published in the journal *Nature Climate Change* argues that the impact of lockdown on emissions levels is **short lived**¹⁴ and negligible at a global scale. The robust research utilised location-tracking mobility data from Google and Apple against 10 different greenhouse gas emissions. It argues that expenditure on green recovery post-Covid-19 will be of greater long-term significance to the overall mitigation effect on climate change.

THE SOCIO-ECONOMIC IMPACT OF COVID-19 AND ITS RELATIONSHIP TO THE ENVIRONMENT

In the journal *Nature*, Sophie Lohman outlines different ways in which people relate to climate change and the COVID-19 pandemic. They show hope that addressing the pandemic may spur on climate action, or frustration that an emphasis on rebuilding the economy quickly may act against the interests of climate action.

While the positive impact of lockdowns on emissions is slight, COVID-19 has had an extreme, negative effect on the UK's economic performance. In the second quarter of 2020 (April to June) the economy shrank by **20.4%**¹⁵, making the UK one of the **worst hit**¹⁶ major economies.

As the UK and nations across the world prepare to rebuild, the opportunity is now to **'build back better'**¹⁷. Prime Minister Boris Johnson **says**¹⁸:

"We must 'build back greener'...the big narrative we're not getting right is that this has to be a green recovery."

A green recovery is a key policy priority for securing job growth and economic prosperity for the regions that have been hardest hit.

The pandemic has also increased **social isolation**¹⁹ amongst vulnerable people, and important elements to get right, when building back greener, are engaging with communities on local initiatives, the provision of social support and the bringing together of diverse groups.

Building back better requires coordinated and collective action across multiple sectors of society. The principle of **'common but differentiated responsibility'**²⁰ is a cornerstone of climate action – it recognises that all citizens, businesses, non-governmental, government and inter-governmental organisations have a duty to reduce greenhouse gas emissions and mitigate the worst effects of climate change; yet leadership and action must come from the worst-polluting nations internationally, and from the worst-polluting sectors domestically.

Any green transition requires 'buy-in' from consumers, local authorities, businesses and a range of other stakeholders. The recently-concluded UK Climate Assembly brought together a group of citizens representative of the UK population, each taking the time to inform themselves on complex issues around green recovery and net zero planning, discussing the topics with experts and each other, and then reaching conclusions. What the results of the Assembly show is that there is broad support for **green economic growth towards net zero**²¹ across a range of different citizen perspectives.

THE ROLE OF HYDROGEN IN A GREEN RECOVERY

Green recovery involves developing new forms of low-carbon innovation to meet global net zero carbon emission goals.

Important work is underway to decarbonise the energy we use to heat our homes and businesses and improve the sustainable performance of our existing natural gas networks. Natural gas is the most common energy source that is currently used in **23 million UK homes**²², and is the source of 30% of UK greenhouse gas emissions. The work involves the replacement of natural gas (which is mainly methane – a fossil fuel) with hydrogen across a 15-year time frame.

When it comes to specific transitions, like those moving towards a hydrogen economy, public awareness and understanding is **very low**²³.

When burned in air, hydrogen (H₂) reacts with oxygen (O₂) to form water (H₂O) and releases energy, so there are no carbon dioxide emissions from combustion. The advantage of hydrogen is that it can, with appropriate modifications that are currently being explored, be pumped through the existing natural gas network into homes and businesses through plastic pipes. This is a rapid shift in the use of our existing natural gas infrastructure, but such shifts have happened before.

The UK transitioned from town gas (made from coal) to natural gas equipment in Great Britain (excluding Northern Ireland) by fitting different-sized burner jets to give the correct gas and air mixture. This took place over 10 years, from 1967 to 1977, at a cost of about £100 million, but the impact on improving indoor and outdoor air quality (and lower carbon emissions) was significant.

A similar change is needed for UK homes in a hydrogen transition. For example, manufacturers have developed hydrogen-ready boilers that work on either natural gas or hydrogen. The key issues are amending existing gas regulation to allow greater quantities of hydrogen into the network and reducing cost to consumers.

Blending hydrogen with natural gas is a cheaper 'bridging' solution to lower-carbon transition of heating networks. Governments and utility service providers worldwide are looking to low- and zero-carbon hydrogen injection into the natural gas grid to displace fossil fuel consumption and reduce emissions.

The advantage of blending hydrogen with natural gas is that it provides a 'quick win' carbon reduction transition pathway, as it requires no change of appliances, underground pipework, additional consumer costs or behaviour change. Moving to 100% hydrogen is a little more challenging.

As the All Party Parliamentary Group on Hydrogen Energy **recommend**²⁴: a cross-departmental hydrogen strategy between Government and industry should become an urgent priority, with an emphasis upon regulatory and investment "levers" to stimulate private sector buy-in from across the heating and transport sectors. Setting national targets for low-carbon hydrogen production, designing, developing and facilitating roll-out of hydrogen-ready boilers, and **demonstrating the UK hydrogen industry at the 2021 COP26 will demonstrate hydrogen leadership on the global stage** as well as stimulate job growth and investment for the UK as a post-Brexit priority.

Boris Johnson's **Ten Point Plan**²⁵ recognises the benefits of increasing hydrogen production, with the aim of generating 5GW of low carbon hydrogen by the end of the decade. The plan proposes to create a Hydrogen Neighbourhood by 2023, comprised of houses heated entirely by hydrogen. This would be followed by a Hydrogen Village by 2025, and eventually a Hydrogen Town by 2030.



THE NATIONAL PUBLIC AND PROFESSIONAL OPINION

As outlined in the previous chapter, the COVID-19 pandemic and climate change are two global crises running in tandem.

New primary research commissioned by NGN via a nationally and politically representative YouGov survey reveals associated attitudes and opinions of the British public on the shift to greener energy sources. It also examines what the economic and environmental priorities and opportunities are for post-pandemic recovery. The findings are expanded through a series of interviews to gather perspectives from within the business community.

NET ZERO

The UK has shown climate policy leadership by being one of the first nations to commit to a target of net zero emissions by 2050.

However, as it stands most people (54%) believe that the UK will not meet its net zero carbon emissions target, and nearly a third (30%) simply do not know either way. Just 16% think that the UK will succeed in meeting this target.

The research asked members of the public to rate how concerned they are about environmental issues globally, nationally and within their local area. A scale was provided of between 0 to 10, where 0 is not concerned at all and 10 is extremely concerned.

94% of people in GB show some concern about the environment on a national scale (scoring at least a 1), with 48% displaying a high level (scoring at least an 8).

90% show some level of concern about the environment within their immediate locality (scoring at least a 1).

A third (33%) are extremely concerned about the environment on a global scale. This figure rises to 40% of 18 to 24-year-olds. This was the youngest age group to participate in the survey and the group to show the highest levels of concern.

COVID-19, EMISSIONS AND TAKING THE RIGHT NEXT STEPS

Mirroring recent research on **public perceptions of climate change during the pandemic**²⁶, most people are as concerned about the environment as they were before the coronavirus outbreak (59%), or even more concerned (14%). As a combined total, that represents nearly three quarters of the GB adult population (73%).

However, with the right course of action, there is hope. When asked what their biggest concerns are about how the country is responding to climate change, just 16% identify that the targets are not feasible.

Reducing emissions requires the development of alternative energy sources and changing the systems used to heat our homes and businesses is an important area of focus.

SOCIO-ECONOMIC FACTORS WITHIN THE UK'S GREEN RECOVERY

Nearly two-thirds (64%) of adults think the UK should take the opportunity to rebuild the post-pandemic economy in a way that is greener and better for the environment. This figure rises to 69% of 18 to 24-year-olds.

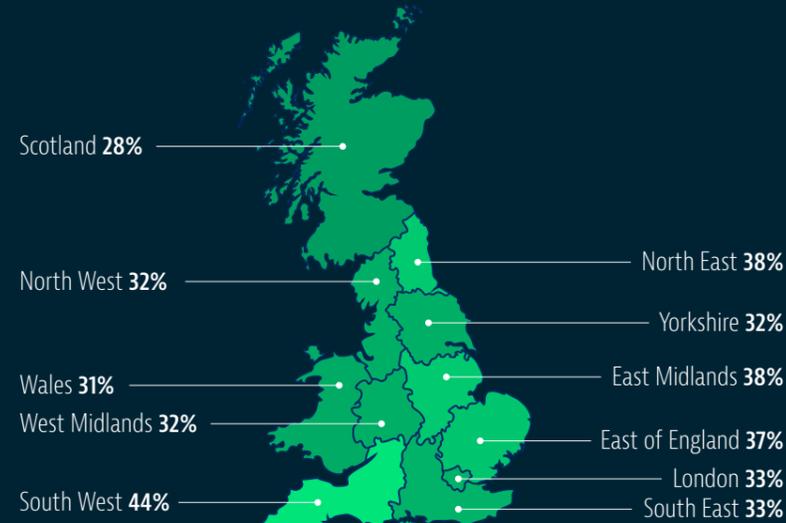
The research asked people to rank the various ways in which future government investment could be prioritised. 20% of 18 to 24-year-olds prioritise unlocking investment in green energy over the creation of job opportunities (20% to 15% ranked it first).

This is significant under current circumstances. Younger people leaving school, college and university in 2020 and 2021 are entering an **uncertain labour market, often while carrying significant debt**.²⁷ To prioritise green recovery at the expense of immediate short-term economic gain is testament to their support for climate action.

"If the UK is going to achieve its net zero emissions target, both energy conservation and new-build housing need to play a very important role. There is positive news on wind, solar and renewables generally, but the issues of how you deal with energy peaks in winter and finding a way to have storable energy sources, which can be up and down according to the level of demand, remain key."

Neil Evans,
Environment Director
Leeds City Council

BREAKDOWN OF REGIONS MOST CONCERNED ABOUT ENVIRONMENTAL ISSUES LOCALLY*



*BASED ON PEOPLE WHO DISPLAY A HIGH LEVEL OF CONCERN (SCORING AT LEAST AN 8)

WHY BUILDING BACK BETTER IS IMPORTANT*



*BASED ON RESPONSES TO MULTIPLE OPTIONS FROM GB ADULTS OF ALL AGES WHO SAID THAT THE UK SHOULD REBUILD IN A WAY THAT IS GREENER AND BETTER FOR THE ENVIRONMENT

Discussing the opportunity to bring communities together, Helen Stockton, Chair of National Energy Action, said:

"It is really important that the Government considers vulnerable and low-income consumers in its plans to 'build back better' and that excluded members of society are able to access the new technologies that are being developed. Progressive ways of funding and making sure that people can be brought into the conversations early will be crucial to this, to ensure that their needs are accounted for and that they have the opportunity to share in the UK's greener future."

A quarter (25%) of adults of all ages believe that the UK should rebuild in any way possible to ensure a return to normality as quickly as possible.

The problem of managing **public uncertainty**²⁸ over climate change is a key challenge for government and for businesses. Predictions about the costs, action, impact and outcomes of climate change can never be made with complete certainty. One problem is that there is often a perceived **responsibility 'gap'**²⁹.

The research reveals a contrast between those who should be responsible for climate action and those who people trust to make change happen.

Lack of commitment to make change happen, from both business and industry, concerns 18 to 24-year-olds most (55%) about the UK's response to climate change, followed by lack of commitment from the Government (44%).

THE MOVE TO HYDROGEN

When it comes to types of climate action, 60% of respondents think investing in green infrastructure would help a region work towards the UK's net zero goal.

However, as outlined in the previous chapter, when it comes to specific transitions to alternative energy sources such as hydrogen, public awareness and understanding is **very low**³⁰. Less than a third (30%) of GB adults currently believe that gas can be green.

Sarah Tennison, Technology and Innovation Manager at Tees Valley Combined Authority, supports hydrogen as part of the UK's energy mix:

"There are some real opportunities around hydrogen, particularly because it is a fuel that can work across a range of technologies. It should absolutely be part of the energy mix but that's not to say that electrification is a no-go as it has a key role to play, particularly for properties that are not on the gas grid for instance. A mix of green options is the ideal scenario, and hydrogen has a really crucial role to play in this."

A collaborative industry project to develop hydrogen as a fuel for the future is underway. It is part of a UK gas industry programme focused on converting the existing natural gas network to carry 100% hydrogen, which would be a significant step towards securing a decarbonised heating solution in line with the government's 2050 net zero pledge.

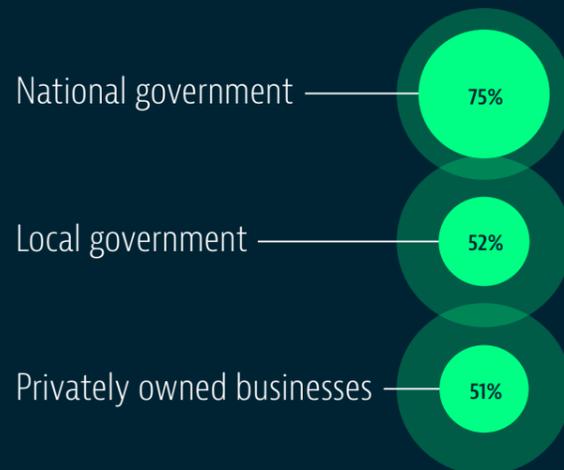
H21 is led by NGN and delivered in partnership with other gas distribution networks - Cadent, Wales & West Utilities, SGN and National Grid Gas Transmission, along with the Health and Safety Executive Science Division (HSE-SD) and DNV GL. It is backed by £16 million of Ofgem Network Innovation Competition (NIC) funding.

The flagship project will establish the critical safety evidence to prove a hydrogen network is a viable alternative to the natural gas network for heating UK homes and businesses. As NGN CEO Mark Horsley states:

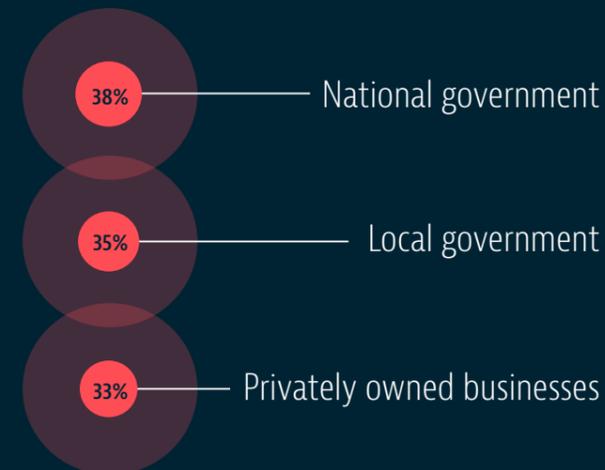
"We firmly believe repurposing the network to carry 100% hydrogen would represent a huge step forward towards meeting the UK's sustainability targets, as well as having a crucial role to play in satisfying customer expectations for a cost-effective and minimal impact transition to lower carbon energy."

TOP THREE ANSWERS WHEN RESPONDENTS WERE ASKED:

WHO SHOULD BE RESPONSIBLE*



WHO TO TRUST TO TAKE ACTION*



*BASED ON RESPONSES FROM GB ADULTS OF ALL AGES WHEN ASKED TO SELECT FROM MULTIPLE OPTIONS



Commenting on the Ten Point Plan announced by the Government in November 2020, Mark Horsley added:

"We're delighted to see hydrogen and carbon capture and storage have formed such a key part of this bold plan, which demonstrates the ambition there is for the UK to lead on climate change strategy and ensure those plans support Green Recovery and job creation."

"Our hydrogen demonstration projects are delivering essential evidence on which policy can be formed, to ensure that customers continue to have choice in terms of low carbon energy, which can be delivered with minimal impact."

"We will continue to work closely with the Government and partners to support the plan and, ultimately, to delivering on Net Zero."

Key Points From the Research:

- Just 16% of people think that we will meet the net zero emissions target by 2050.
- Coronavirus has not deflected concern for the environment, for some it is now heightened.
- 64% want to rebuild the economy in a way that is greener and better for the environment.
- More 18 to 24-year-olds want the government to prioritise unlocking investment in green energy (20%) than on job creation (15%).
- Of those that said the UK should take the opportunity to rebuild in a way that is greener and better for the environment, more than a third (35%) think a green recovery will help to bring communities together.



THE NORTH: DRIVING FORWARD THE GREEN INDUSTRIAL REVOLUTION

The North of England was a driving force in the industrial revolution and there is opportunity for the north to once again be at the forefront of change.

People in the North of England are most proud of their region's industrial heritage compared to those that live elsewhere in the UK.

NGN is involved in several research and demonstration projects within Yorkshire, Cumbria and the North East to push forward a new 'green' industrial era, each designed to help the UK achieve its net zero emissions target.

It commissioned a second YouGov survey to capture insights from more than 1,000 residents living within its catchment areas, to understand their environmental and societal values around climate change planning and sustainable growth.

When asked about the aspects of their region's industrial heritage that they are most proud of, 41% of people in both the North East and those that come under the North West highlighted the talent of local people – compared to 28% of people nationally.

45% of people in the North East are proud of the discoveries and inventions made by people locally – compared to 24% of the GB average. 40% of people who come under the North West are proud of the sense of identity their industrial heritage brings to communities – compared to a national average of 24%.

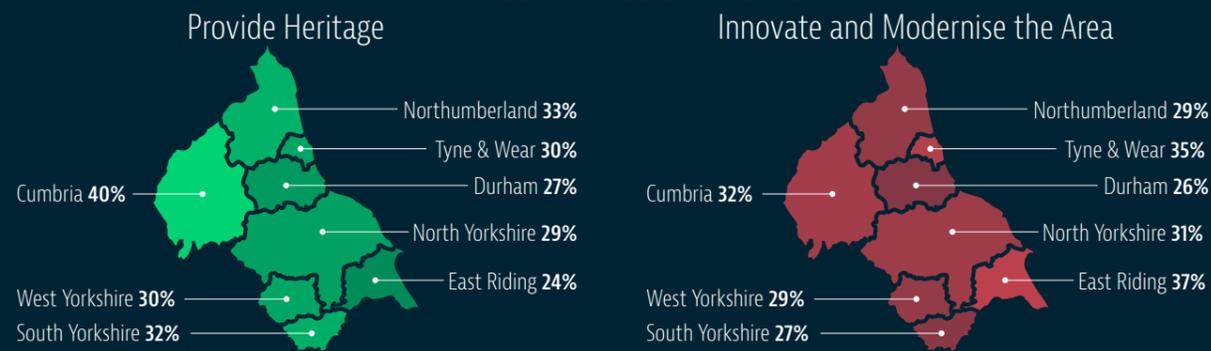
34% of 18 to 24-year-olds, and 30% of people of all ages across the North of England think that large, privately owned businesses provide heritage and a sense of place, putting their local area 'on the map'. Likewise, almost a third (30%) of people in the North of England think that large, privately owned businesses innovate and help to modernise their region.

BRITISH REGIONS MOST PROUD OF THEIR INDUSTRIAL HERITAGE*



*RESPONDENTS WERE ASKED WHICH ASPECTS OF THEIR REGION'S INDUSTRIAL HERITAGE THEY WERE PROUD OF. FIGURES WERE CALCULATED BY ADDING TOGETHER RESPONDENTS THAT SELECTED AT LEAST ONE ASPECT.

ON THE MAP - THE NORTHERN REGIONS WHERE RESIDENTS BELIEVE LARGE, PRIVATELY OWNED BUSINESSES:



A fifth of people in Northumberland (21%) and Tyne & Wear (20%) specify that large, privately owned businesses move the sustainability debate forward and provide opportunities to get involved.

Commenting on the North East and its role in a new green industrial revolution, Andrew Clark, Energy Programme Lead at the North East LEP, said:

"The North East, in many ways, is leading on aspects of the UK's green energy agenda. The region is not just focused on one element; we've got quite a broad set of strengths around green energy, including electric vehicles, battery technology, and the decarbonisation of heat. The region pioneered the National Grid, lightbulbs, the steam engine and coal – which powered the industrialisation of the UK. We're now moving from a fossil fuel heritage to being at the cutting edge of the next Industrial Revolution centred on low carbon, so it's important that we tell this story as well."

NET ZERO, COVID-19 AND REDUCING EMISSIONS

Consistent with the view nationally, most people in the North are either as concerned about the environment as they were before the coronavirus outbreak (59%), or more concerned (12%, rising to 15% of 18 to 24-year-olds) – 71% in total across all age groups.

The research asked people to identify the top three things that concern them most about how the UK is responding to climate change. A lack of commitment from business and industry to make change happen is the biggest concern (43%), compared with 55% in Cumbria. Lack of commitment from government to make policy decisions to achieve net zero (31%), along with the cost of change (31%), are also in the top three.

45% of adults in the North West that come under the NGN catchment area think that improving environmental education would help their region work towards the UK's net zero carbon emissions target, with 37% of adults in Yorkshire and the Humber, and 40% of adults in the North East feeling the same.

Respondents were provided with a selection of factors and invited to contribute their own to identify what they think would best help a region work towards the national carbon emissions target.

Investment in green infrastructure such as transport, green gas and renewable energy is the top choice (57%) across Yorkshire, the North East, and Cumbria.

THE TOP FIVE FACTORS THAT PEOPLE LIVING IN THE NORTH OF ENGLAND BELIEVE WOULD HELP A REGION WORK TOWARDS THE UK'S NET ZERO CARBON EMISSIONS TARGET



INVESTMENT IN GREEN INFRASTRUCTURE SUCH AS TRANSPORT, GREEN GAS AND RENEWABLE ENERGY (57%)



GOVERNMENT SUPPORT / SUBSIDY FOR GREEN TECHNOLOGY AND INITIATIVES (49%)



ENERGY EFFICIENT HOUSE BUILDING (47%)



IMPROVING ENVIRONMENTAL EDUCATION (39%)



STRONG LOCAL AUTHORITY SUPPORT (35%)

SOCIO-ECONOMIC FACTORS WITHIN THE GREEN RECOVERY

Among northern residents that believe the UK should rebuild the economy post pandemic in a way that is greener and better for the environment, half believe that it will bring new job opportunities (51%). A third believe that it will make the UK a world leader (34%) and 33% believe that it will bring communities together.

Simon Pringle, Chair of the Leeds City Region LEP Green Economy Panel, said:

"If we've learned anything from the coronavirus outbreak it is that we can't revert back to the pre-pandemic environmental situation. The recovery offers up an opportunity to address some of the climate emergency challenges and building back better is essential if we are going to hit net zero by 2050 or sooner. It is critical, from an inclusive growth point of view, that communities are brought along with the lower-carbon-society transformation."

"In the North, we know what an unadjusted transition looks like, with areas like the Barnsley coalfields still visibly scarred from rapid economic and social shifts that were imposed on those areas. Building back better is about bringing new, long-term sustainable job opportunities to the North, creating the potential for good quality careers and building supply chains for green initiatives, like retro-fitting homes, energy generation and carbon capture."

"The North has the opportunity to be part of the solution to the decarbonisation challenge that we face, as long as we make the right policy decisions and create the policy clarity that's required. This relies on government not defaulting back to a pre-pandemic linear economy mindset."

Most think that large, privately owned businesses have an important role to play in underpinning the local economy (57% of all regions, with 65% in Cumbria and North Yorkshire and 60% in Northumberland). The creation of job opportunities and skilled work, leading to a strong local economy, is the top priority for 19% of northern residents, rising to 33% in Cumbria and 25% in Northumberland.

One in three (36%) think that large, privately owned businesses support education and skills development, providing apprenticeships and long-term career prospects. This rises to 49% of people in Cumbria, 43% of people in Northumberland and 39% of people in North Yorkshire.

Opportunity Action Plan: In 2020, NGN launched its Opportunity Action Plan in partnership with former Secretary of State for Education, Justine Greening, and the Social Mobility Pledge campaign. The plan is dedicated to 'levelling up' the employment landscape in the Yorkshire area and aims to provide practical skills and lower the barriers to workplace apprenticeships so that they are accessible to a wider group of young people. NGN has invested £3.7 million in employee training this year and has recruited over 130 apprentices in the past 15 years. It is committed to providing comprehensive training in STEM careers for people from a wide variety of backgrounds and with different levels of experience, and more than 50% of its workforce are now aged 40 or under.

One example of a local community project is the award-winning Warm Hubs. NGN has partnered with Community Action Northumberland (CAN) to fund and develop the project that provides residents in rural, off-the-grid areas with access to friendly and warm places to socialise, enjoy refreshments and seek advice on topics such as energy efficiency. More than 1,480 residents in Northumberland use the service throughout the year.

The Connecting Homes for Health pilot project is another such example of the crucial role businesses and charities play in providing for the communities they serve. The initiative, delivered by National Energy Action in partnership with NGN and YES Energy Solutions, installed free gas connections and central heating systems in over 100 properties in the North East of England where residents were on low incomes and at risk of cold-related ill health.

Before receiving help, more than eight out of 10 participants felt that their health was affected by being unable to keep warm at home. This reduced to less than one out of 10 after intervention. Residents also reported improvements in how easy their new systems were to use; how affordable they found their energy bills and how well they could keep their homes warm. The project not only measured the impact of support on the health and wellbeing of vulnerable residents, but also aimed to demonstrate the wider potential for tackling health inequalities, providing insights and making recommendations for how future schemes could be shaped.

In addition to underpinning the economy through employment and skills development, large businesses play an important social role. One in five (22%) think that businesses in their region are an anchor for the community and bring people together. 21% of 18 to 24-year-olds in the North think that local businesses look after more vulnerable members of the community, compared to 12% of people in the same age group nationally.



THE HYDROGEN ECONOMY: BENEFITS TO GREEN GROWTH IN THE NORTH OF ENGLAND

The North is driving forward innovation in green infrastructure and NGN is involved in several projects, including in Gateshead, Middlesbrough and Cumbria, that demonstrate world-class engineering and innovation, delivered by local teams. Each are working to ready the existing network to deliver hydrogen, a clean-burning gas, as a fuel of the future. The hydrogen economy, and the green growth opportunities it creates, have both environmental benefits nationally and societal benefits regionally.

Sarah Tension, Technology and Innovation Manager at Tees Valley Combined Authority, said:

"I think northern regions have a really strong role to play, not just in terms of decarbonisation, but also the fact that there's quite a significant amount of export activity that happens in the North's industrial clusters. For instance, in Tees Valley, we export billions of pounds worth of products every year. GVA [Gross Value Added] in the clean energy sector is three times the national average per head and our higher wages in the sector reflect that. When people think about industrial clusters in the North of England, I think they often perceive that most are a dying industry with low paid jobs. I don't think many people realise that industrial clusters are high wage, highly skilled economies. These are high tech, exporting companies and that's relatively unusual."

"For the UK, where we don't have that many sectors that actually export. Industrial clusters form a very strong part of the economy and are really important for growth. They do release a significant amount of CO2 but there are a number of options to decrease that CO2 quite significantly, with carbon capture and hydrogen being the main options. The options are there and they're completely viable, with major investors looking to develop CCS and hydrogen in a number of clusters such as Teesside. Five major oil and gas companies are looking to invest three billion pounds in a CCS power station. So, you've got a significant investment looking to come into industrial clusters, and you've got the fact that they're really important economically."

Andrew Clark, Energy Programme Lead at the North East LEP, said:

"We believe the North East is really well placed to deliver on low carbon, clean energy sectors growth opportunities. If the Government puts supportive policies or funding in place to help give certainty to the sector, it would enable a lot of value to be unlocked and job creation and GVA growth to be accelerated."

"The North East is working to act as a catalyst region to solve some of the UK's big energy challenges. For example, our North East Energy Catalyst partnership brings together all of our energy innovation and demonstration assets."

"The [North East Energy] Catalyst is developing a series of collaborative projects as we believe we have the asset base to solve some of the big global energy challenges that exist. For example, one of the projects is InTEGREL, a [whole energy systems test bed] facility based in Gateshead and led by Northern Gas Networks. It researches, develops and tests different energy technology solutions [at scale] on site, across vectors. As the green recovery theme has been part of the government's thinking, we have seen fantastic opportunities to support projects like this through the Get Building Fund."

"With continued opportunities for national public or private funding, it would not only allow us to create more jobs in the clean energy sector but also allow us to accelerate energy solutions that can be adopted more widely across the UK."



When asked what they perceive to be the benefits of projects that investigate hydrogen as a fuel for the future, 42% of people in northern England consider it a clean alternative to fossil fuels for heating homes and businesses. 33% say it will preserve the planet for future generations, 29% say that it will contribute to the green recovery and growth of the economy through job creation and 20% say that it will position the UK as world leaders in a new industrial revolution. Only 6% of Northerners think there are no environmental and societal benefits to using hydrogen.

Simon Pringle, Chair of the West Yorkshire Combined Authority Green Economy Panel, said:

"The hydrogen economy is coming out of the North as this is where the infrastructure and skills base lies, but rather than viewing it as a silver bullet, hydrogen needs to be part of a networked, whole system response to decarbonisation."

In meeting net zero policy goals, NGN is pioneering a transition from natural gas to hydrogen within its network. **HyDeploy**³¹ is the first ever live demonstration of hydrogen in homes, aiming to prove the safe blending of up to **20% by volume hydrogen** with natural gas. A first pilot is currently underway at Keele University in Staffordshire, where 130 homes and campus buildings are using blended hydrogen for heating and cooking.

In 2021, NGN will host the HyDeploy pilot study in Winlaton, Gateshead, when 670 homes and businesses will begin using blended gas containing 20% hydrogen in the local network using existing infrastructure.

Backed by £22.5 million of innovation funding from the Office of Gas and Electricity Markets (OFGEM), HyDeploy is a collaboration led by Cadent in partnership with NGN, the Health & Safety Executive (HSE), clean energy project management specialists Progressive Energy, and a consortium of industry experts who jointly oversee the safe management of the project.

The purpose of the demonstration is to show how hydrogen can deliver important and rapid carbon reductions in order to combat climate change without customers needing to change their appliances or behaviours. A further demonstration in the North West will also take place in order to test the blend across a range of networks and thus provide policy-relevant evidence that is representative of the UK as a whole.

H21, as outlined previously, will demonstrate how gas distribution companies would manage the network and the **conversion to 100 percent hydrogen** safely. In Cumbria, tests will be carried out on a gas microgrid at DNV GL's test and research facility at the RAF Spadeadam base. The site is already home to three houses called the HyStreet, which are fitted with fully working hydrogen boilers to provide hot water and heat radiators. In another phase of the project, trials will be carried out on an unused section of the gas network in the South Bank area of Middlesbrough.

Upon completion of these pilot projects, the 'scaling-up' of the technology will require strong policy commitments from national government.



Sarah Tension, Technology and Innovation Manager at Tees Valley Combined Authority, said:

"I really hope a COVID-19 green recovery strategy focuses minds because we're at a point with decarbonisation where significant investment decisions need to be made, particularly around carbon capture and hydrogen. We need to see proactive support and investment in projects like the refuelling infrastructure for a hydrogen transport network, which has been in the offing for quite a while."

"We shouldn't forget that there are multinational companies wanting to make investments in the UK, including the North, and this will support the local communities with job creation. The longer we linger and delay, the more likely it is that those companies will look elsewhere in the world for their investments."

Key Points From the Research:

- A lack of commitment from business and industry to make change happen is the biggest concern for 43% of people in the North of England when asked about how the UK is responding to climate change.
- Lack of commitment from government to make policy decisions to achieve net zero (31%), along with the cost of change (31%), are also in the top three concerns.
- 45% of adults in Cumbria and 37% of adults in Yorkshire think that improving environmental education would help their region works towards the UK's net zero carbon emissions target.
- Most think that large, privately owned businesses do underpin the local economy by providing employment (57%).
- The creation of job opportunities and skilled work, leading to a strong local economy, is the top priority for future investment for 19% of northern residents, rising to 33% in Cumbria and 25% in Northumberland.
- One-in-five people (22%) in the north think businesses are an anchor for the community and bring people together.
- 42% of Northerners consider hydrogen as a clean alternative to fossil fuels for heating homes and businesses. The H21 and HyDeploy initiatives will demonstrate this in 2021.



A CLIMATE FOR CHANGE: RECOMMENDATIONS

The research reveals that just 16% of people think that the UK will meet the net zero carbon emissions target by 2050.

The global pandemic has not deflected concern for the environment: for some, their concern is now heightened. With climate action rooted firmly in public consciousness, public support for a green recovery is high – nearly two thirds (64%) of people want to rebuild the economy post pandemic in a way that is greener and better for the environment.

Support for sustainable action is expressed most strongly by the youngest generation (18 to 24-year olds), even though they may suffer the greatest impacts of job losses and economic uncertainty in the face of the post-COVID-19 economic slump. More young people want the government to prioritise investment in green energy than job creation. Crucially, it is important to understand that one helps to achieve the other.

The benefits of building back better are not limited to the environment and regaining economic prosperity, but also to the opportunity to promote positive social values. Among those that said the UK should take the opportunity to rebuild in a way that is greener and better for the environment, more than a third (35%) think a green recovery will help to bring communities together.

Large, private businesses powered the first industrial revolution and will spearhead the next as the UK prepares for a green industrial era. Residents in the North of England are the proudest of their industrial heritage and northern communities, many of which have been the hardest hit by the industrial decline of the past and by the impact of COVID-19 in the UK, are now set to reap the rewards of new, green growth.

Green growth presents opportunities for collaboration amongst northern England's policy shapers and national policy makers, and similarly can encourage collaboration within communities – strengthening community engagement. Drawing from the experience of the industrial past, recommendations can be drawn:

- To prioritise green growth and new, skilled job creation in the regions hit hardest by the pandemic, many of which are in the North.
- To ensure industry has a role in helping to identify pathways and offers opportunities for young people and those upskilling.
- To ensure communities are engaged and involved in local initiatives – improving public confidence in climate action through demonstration and active **public engagement**³².
- To ensure that businesses driving forward the green agenda commit to bringing together diverse groups and provide social support to vulnerable members of society.

The North of England is driving forward innovation in green infrastructure, acting as a catalyst to solve some of the UK's big energy challenges. Green infrastructure clearly has an important role to play in the UK's economic recovery post pandemic and developing an alternative energy source for heat is a crucial component within a strategy for achieving net zero emissions. In 2021, a number of important milestones will be achieved in projects taking place across the North of England, that will provide the necessary evidence to facilitate the UK's transition strategy from natural gas to hydrogen as a fuel for the future.

Collaboration between government, industry and private business is already powering growth in a new hydrogen economy, underpinned by skilled job creation at a local level. However, sustainable action requires policy as well as technological innovation.

The UK was the first to demonstrate climate leadership when it committed to net zero emissions by 2050. However, lack of commitment from Government to make the required policy decisions is among the top concerns held by the public regarding ways the UK is responding to climate change.

The 2021 United Nations Climate Change Conference, COP26, due to be held in Glasgow in November 2021, provides a platform for the UK to demonstrate hydrogen leadership on a world-scale. This must be a government priority, supported by policy commitments that enable the UK to meet the net zero target:

- To accelerate investment in low-carbon energy for heating and cooking – stimulating innovation to develop alternative energy sources such as hydrogen and speeding up progress to develop the required technology.
- To establish national targets for local carbon hydrogen production.
- To grant regulatory approval to allow more hydrogen into the gas network and to reduce cost.
- To facilitate the roll out of hydrogen-ready boilers and to standardise safety.

The transition from a system of heating heavily reliant on natural gas to hydrogen is a specific concern of utilities providers, home builders and domestic and commercial energy consumers. Most homes and businesses in the UK rely upon natural gas, and hydrogen could present a bridging transition by blending hydrogen with natural gas through the same supply network, achieving a modest carbon saving. 100% conversion of the gas network to hydrogen could achieve significant carbon savings, however it would require strong government commitment, subsidy change to encourage 'demand pull' and uptake amongst consumers, as well as extensive public engagement to ensure that citizen concerns of safety, cost, carbon savings and energy efficiency are considered in the design of the system.

Governments around the world are taking action to develop regulatory standards for hydrogen injection into the natural gas delivery network, as well as mechanisms to boost industry capacity and roll out of new appliances. Projects in the North of England such as HyDeploy and H21 are vital in demonstrating the efficacy and safety of a hydrogen transition, but these need to be combined with policy commitments towards scaling up pilot projects to comprehensive infrastructure systems, to demonstrate a regulatory framework through Ofgem for blended hydrogen standards and ensure cost efficiency for consumers.

"We believe the gas network can operate on 100 percent hydrogen in the future to achieve net zero carbon emissions. The gas network is a huge asset which transports gas reliably and has the flexibility to meet a winter demand which is five times as great as that in the summer."

"Hydrogen boilers have already been developed by leading manufactures Baxi and Worcester Bosch and are now up and running in our H21 demonstration homes. They look and feel just like the boilers we use today. When the time comes a simple conversion by a gas engineer, taking perhaps 30 minutes, would be all the disruption that is needed for a customer to switch to hydrogen."

"Whilst heating houses with electric may provide an economical solution for newly built homes, for the vast majority of UK housing stock hydrogen gas would provide a more cost efficient and less disruptive carbon-free solution for customers."

Tim Harwood
NGN's Project Director for H21

THE NEED FOR PUBLIC AWARENESS RAISING AND INFORMATION SUPPORT

Work clearly needs to be done to engage with different sectors of society on the potential benefits of hydrogen fuels to reduce carbon emissions and meet net zero targets, given the strong support for technological innovation and government investment to resolve the climate crisis.

Building a long-term trust relationship known as a social licence to operate is necessary for future success of hydrogen deployment. Where uncertainty and risk permeate a new technology or industry, openness, transparency and community outreach are important. This is especially true in the age of COVID-19 when social isolation and exclusion have worsened community connections. Public utilities and other large-scale industries must therefore actively support community development initiatives to achieve social as well as environmental sustainability.

It is important to note that the research in this white paper, and other recently conducted [survey research](#)³³, suggests that there is limited public awareness and knowledge of hydrogen as a possible fuel for UK homes among the public. One of the challenges for a public information and engagement campaign is the “invisibility” of hydrogen: not only its physical nature as a colourless and odourless gas, but also a lack of public clarity about its sources, impacts and risks.

Finding ways to visually engage citizens with these aspects of the fuel, and the infrastructure network that supports it, is a vital part of the hydrogen transition. Moreover, given the novelty of hydrogen energy, low experience and public knowledge, it is important that gas system development organisations and government authorities engage in “upstream dialogue” with ordinary citizens to better map out their concerns, information needs and attitudes towards hydrogen transition.

Failure to ensure public acceptance of the technology in advance of its deployment would lead to costly and damaging public opposition further down the line, and so initial future policy on hydrogen deployment should emphasise this engagement aspect as a fundamental component of project design and delivery.

Public support for a green recovery is strong. The UK can and will build back better from the pandemic through clean energy, nature-based solutions, and adaptation and resilience planning. Reaching net zero requires big, but achievable, changes, both to society and to the ways in which our economy can grow sustainably, enabling the needs of both the current and future generations to be met. As individuals, the concept of ‘think global – act local’ is relevant. As a government, the time is now to make the necessary policy commitments to enable strong regional and national advancement towards the net zero carbon emissions goal.

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