Volume 37 Number 3
December 2020

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ENERGY FOCUS

The journal of appg PGES All-Party Parliamentary Group for Energy Studies Founded in 1980

The All-Party Parliamentary Group for Energy Studies
Established in 1980, the Parliamentary Group for Energy Studies remains the only All-Party Parliamentary Group representing the entire energy industry. PGES aims to advise the Government of the day of the energy issues of the day. The Group's membership is comprised of over 100 parliamentarians, 100 associate bodies from the private, public and charity sectors and a range of individual members.

Published three times a year, Energy Focus records the Group's activities, tracks key energy and environmental developments through parliament, presents articles from leading industry contributors and provides insight into the views and interests of both parliamentarians and officials.

PGES, Room 2.2, Speaker's House, House of Commons, London SW1A 0AA www.pges.org.uk

Executive Council

Energy Focus

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Cover image original work, drawn by annietheillustrator.co.uk. Chairman's portrait drawn by Calum Hanchett. ©PGES 2020, prints available.

ISSN 0265-1734 For non-members, annual subscription rate is £65.00, single copies £27.00
Members receive a complimentary copy as part of membership to the Group

"We have our own dream and our own task. We are with Europe, but not of it. We are linked but not combined. We are interested and associated but not absorbed." 1930
"The future of Europe if Britain were to be excluded is black indeed." 1963
Winston Spencer Churchill

Printed in Great Britain by First Colour Ltd, 15 Newman St, London W1T 1PA

CHAIRMAN'S FOREWORD

PGES has its 40th Anniversary at the most unfortunate time, but still a fortuitous time all the same. CoViD 19 and Brexit are dominating the political landscape, but, as I write this, it feels as though energy is the only game in town that is receiving great attention. Of course, we have the upcoming CoP26 next year in Glasgow, which is driving many developments.

So, PGES continues to inform the Government of the day on the energy issues of the day and has been recognised as such. To celebrate our 40th anniversary, we have launched the first ever PGES Inquiry, "**What are the energy policies that will drive an independent UK to net zero while fuelling the economy?**". Full details can be found in this edition, or on our website pges.org.uk/inquiry. The closing date for submissions is 29th January 2021, but the earlier you send your response in, the better.

This is the second edition of *Energy Focus* that comes to you from under lockdown - although there is a vaccine approved, others on the way and the restrictions are still upon us, the virus repeatedly reminds us of its presence. CoVid-19 undoubtedly presents a huge social and economic challenge to us all.

We have undergone a lifestyle revolution. I have said it before, I suspect that our lives will never be quite the same again. We have adopted so many new ways of conducting ourselves at work, at home and at leisure, many of these will continue for months or years to come.

This December has been the busiest I can remember for many years, as we have the 6th Carbon Budget, the Prime Minister's 10 Point Plan, the Climate Ambition Summit and the long-awaited Energy White Paper. We carry notice of each of these in *Energy Focus* alongside reports of our activities.

We also have a really busy year ahead, with the whole world focussed on energy and particularly the UK. That is why PGES stands ready to play its part. Using the responses we get from the inquiry, we will continue to put forward consolidated policy suggestions before MPs, Peers, ministers and civil servants.

We can only hope for a better year in 2021 than it was in this past year. Many have suffered sickness, loss and loneliness. But, the portends are good, so, may I take this opportunity to wish you all a very happy Christmas and a prosperous *and healthy* new year!

Ian Liddell-Grainger MP
Chairman PGES

ALL-PARTY PARLIAMENTARY GROUP FOR ENERGY STUDIES 40TH ANNIVERSARY INQUIRY

"WHAT ARE THE ENERGY POLICIES THAT WILL DRIVE AN INDEPENDENT UK TO NET ZERO WHILE FUELLING THE ECONOMY?"

https://pges.org.uk/pges-40th-anniversary-inquiry

The All-Party Parliamentary Group for Energy Studies aims to inform the government of the day of the energy issues of the day. To mark its 40th Anniversary and the UK's watershed year - post Brexit, post CoViD-19, and pre CoP26 and 2050 - PGES is launching an inquiry on the importance of energy in the context of UK as an independent nation.

We are seeking views on the key policies required from those who supply, need or use energy. The inquiry asks fundamental questions across our activities because energy is the vital resource. Without energy, there is no economy.

This is the time to open the debate. Outside the EU, the UK is establishing policies now that will affect future generations. The 'fourth industrial revolution' has moved industry from mechanical to digital and a lifestyle revolution, accelerated by CoViD-19, is dramatically changing our energy footprint. Meanwhile the challenge of net zero has prompted local, regional and sectoral organisations to use their initiative, skills and resources to encourage place-based decarbonisation.

This is a complex agenda. PGES will put practical policy suggestions for the coming year and beyond to ministers, MPs, Peers and government departments. We are seeking input from across the economy and need your views.

To respond to the inquiry
Please keep answers clear and concise.
Highlight the potential for scale (national, regional, city, community, individual. Include LEPs)

Please also submit a 200 word summary of response key points. These will be collated into an appendix.

All responses will be published. You will be asked whether your responses can be attributed to you.

PLEASE RESPOND BY 29TH JANUARY

How to Respond

Go online – the Inquiry has a link from PGES.org.uk
Fill in document attached and email to matthew@pges.org.uk
Survey monkey – follow this link

Or post the completed form to:
All-Party Parliamentary Group for Energy Studies
c/o Lynwood House
Blakes Lane
Hare Hatch
RG10 9TA

ALL-PARTY PARLIAMENTARY GROUP FOR ENERGY STUDIES 40TH ANNIVERSARY INQUIRY

"WHAT ARE THE ENERGY POLICIES THAT WILL DRIVE AN INDEPENDENT UK TO NET ZERO WHILE FUELLING THE ECONOMY?"

Please answer these questions. It is not essential to answer every question.

Please keep each answer to a maximum of 100 words.

ABOUT YOUR SECTOR

1. Tell us on whose behalf you are answering the questions
2. What is your sector?
3. What is the key risk or burden of decarbonisation in your sector?
4. What is the sector's key opportunity in decarbonisation?
5. What is the biggest element of energy policy that is holding you back?

ABOUT DECARBONISATION PROGRESS

6. What behaviour or technology do you see as key to decarbonisation? What is the
   - timescale for deployment?
   - effect of their deployment?
   - barriers to their deployment?
   - costs of deployment?
7. How can your sector organisations become active and flexible consumers of energy to help them decarbonise?
8. Where can UK government investment be most effective?

ABOUT GOVERNANCE AND ORGANISATION

9. How can place-based (local and regional) resources and organisations be harnessed to deliver net zero?
10. What areas are hard to decarbonise? Why? Are they essential or is there an alternative?
11. How should the efficiency, effectiveness and cost of decarbonisation be assessed?
12. In what UK policy do you believe there is cross party consensus where action can be taken?
13. What UK policy area do you see controversy that requires intensive policy negotiation?
14. What actions should be taken to raise awareness on energy and the climate emergency? (public, workforce, investors, legislators)

THE 2021 AGENDA

15. What should the UK do differently, post Brexit and post CoViD-19?
16. What is the most important agenda item for COP that would enable the UK to maximise its effectiveness as the host?

SUMMARY

Please provide a 200 word summary of key points Your answers above and the summary will be published. Please say whether you want it to be attributed to you, or kept anonymous

Name:

Position:

Organisation:

Email:

Please complete the inquiry on line here or send your completed submission by email to Matthew@PGES.org.uk before 29th January 2021.

SUCCESS AT COP26 STARTS AT HOME: LEADING BY EXAMPLE ON NET ZERO

SEPTEMBER SPEAKER MEETING

Steve Holliday FREng FEI, Energy Institute President and former National Grid CEO

Steve reflects on the PGES meeting at which he spoke alongside Energy Institute CEO Louise Kingham OBE FEI and UKERC Director Rob Gross FEI.

Energy professionals in my experience are a pretty hard-headed bunch. They're engineers, technicians, scientists and economists, driven by the practicalities of what it takes to keep the electrons and molecules flowing to our homes, businesses and vehicles. I value their methodical, fact-based view of the world because it delivers for us all day-in-day-out, even in these exceptional times.

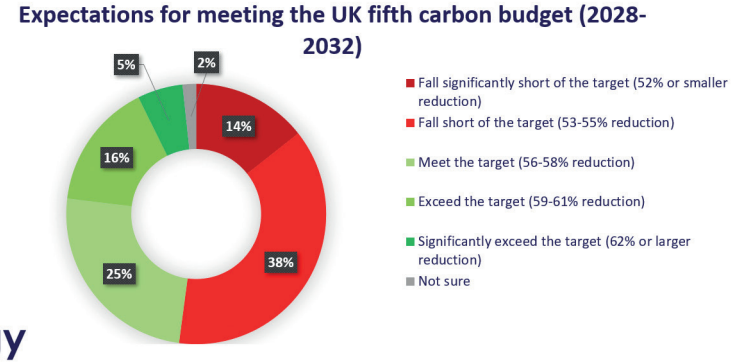
So when we survey the Energy Institute's members in the UK every year in our Energy Barometer, about their sector and the world around them, I listen. And this year's survey, focused on net zero and the impact of COVID-19 could not be better timed.

There's no doubt the UK has a strong track record as a climate leader. The Climate Change Act was in its day the first of its kind, and upgrading the target to net zero last year in line with the science put us back in the vanguard.

I was privileged to have been at the helm of National Grid during what I now see as the first decade of that net zero journey. And progress getting renewables onto, and coal off, Britain's electricity grid has been astonishing.

But our survey published over the summer shows energy professionals are worried. Nine in ten of them believe the UK is currently off track for net zero by 2050; more than half of them say we're even off track for the target for 2030 without urgent policy action.

More than half do not even expect the UK to meet its fifth carbon budget (57% reduction in emissions compared to 1990 levels)



MORE AMBITIOUS POLICIES ARE NEEDED AND FAST

In this endeavour, numbers matter. Zero is the goal, but emissions are still only down around 40% and the hardest work is yet to be done. Dates matter too. 2050 might sound like a long time away, but the lead times for technology development and deployment are lengthy. If we're to have a chance of net zero by the middle of the century, the 2020s really have to be the decade of delivery.

Fortunately, the Energy Barometer contains help for ministers looking for solutions. Before anything else, our members prescribe the unfinished business of bringing the nation's buildings up to scratch. Energy efficiency is singled out as both the biggest missed opportunity of the past decade and the foremost option for plugging the emissions reduction gap for the 2030 target at least cost.

Furthermore, in the context of COVID-19, more members urge retrofitting existing housing stock than any other action for a resilient recovery, probably for the same reasons it's finding favour with ministers. It has nation-wide, job-creating potential, with long term environmental and social benefits.

In fact, our members overwhelmingly support calls for ministers to turn the discontinuity caused by the pandemic into the moment we get real about the climate threat and the shape of the future economy. Four in five agree with the Committee on Climate Change (CCC) that stimulus should be channelled into green industries and jobs, and support for emissions-intensive sectors should be contingent on action on climate change.

A 'green recovery' from COVID-19 could be the catalyst

Recommendations from Committee on Climate Change letter to the Prime Minister

The Government should…	% of respondents who **agree/strongly agree**
Ensure a **just recovery** regarding costs	**87%**
Capitalise on changed social norms to benefit well-being and reduce emissions	**83%**
Make support for emissions-intensive sectors **contingent on them taking action on climate change**	**80%**
Prioritise climate-related investments to support economic recovery and jobs	**79%**
Replace lost or threatened jobs by creating **new ones as part of a low-carbon economy**	**74%**
Design a future UK **carbon pricing** mechanism	**72%**

energy institute

Bold decisions urgently need taking in heat and transport, to set us on that path to net zero by 2050. Top of the list are funding and incentives to bring on low-carbon aviation fuels, hydrogen HGVs, heat pumps, hydrogen-ready boilers, and demonstration of CCUS in power generation and industrial clusters.

MORAL AUTHORITY

All of this matters for the UK's economic recovery and for delivering on our legally binding targets, but it also matters for Glasgow and COP26. Without immediate domestic policy steps from ministers, to quote the CCC's Lord Deben, "the UK's international credibility is on the line".

It was clear that COP21 President Laurent Fabius and the formidable French diplomatic machine commanded respect and were listened to. But, as he travelled the world's capitals building support for an ambitious deal, back at home France passed the Energy Transition for Clean Growth Act, putting in place binding energy targets on transport, housing and renewable energy, with the aim of halving French energy consumption by 2050. It signified France's strong political commitment to mitigating climate change.

Orchestrating the international 'Race to Zero' and the diplomacy required by it over the next year will call for every bit of credibility we can muster. Hence why leading by example at home is singled out by EI members more than any other measure as the number one priority for maintaining the UK's status as a climate leader.

The delay to COP26 bought breathing space but the test is fast approaching when the UK will need to prove its moral authority. The world has entrusted the UK with COP26. Only with ambitious clean energy action at home can we inspire reciprocal action from countries around the world.

The Energy Institute's Energy Barometer 2020 can be found at www.energyinst.org/barometer/2020

Note: This ties in very closely with the PGES Energy Policy Priorities

CLEAN ENERGY FOR A CLEAN WORLD

NOVEMBER SPEAKER MEETING

Dr. Mark Selby, FREng, Chief Technology Officer, Ceres Power Limited

Ceres Power is a leader in the electrochemical technology sector enabling the world's most progressive companies to deliver clean energy at scale and at speed. We pioneer advanced hydrogen production and use technologies - electrolysers and fuel cells - and embed them - through licensing manufacturing and system design - in to our partners organisations to meet their strategic imperative to transform to clean energy. Today those partners include some of the largest and most active global companies in decarbonisation: Bosch, Doosan, Weichai, Honda and others.

Hydrogen, today, accounts for about 4% of final energy demand globally, and over 95% of that is generated from fossil fuels. So the first thing is hydrogen today is not very green yet but it can be and there are technology solutions to that and decarbonizing hydrogen and producing green hydrogen is a huge commercial opportunity for the UK. Credible estimates from organisations like Goldman Sachs, McKinsey, or the Hydrogen Council for the value of a 2050 Hydrogen Industry range from 2- 12 trillion dollars, Oil & Gas is around 3 trillion dollars today. Other countries government believe these estimates and have announced huge Hydrogen specific, post-COVID, stimulus packages: $14Bn from South Korea, Đ9Bn from Germany, Đ550Bn for Hydrogen from the EU amongst too many others to list.

The discussion in the UK with relation to hydrogen is relatively limited to Heat and Transport but this is not typical of the global conversation. More expansive visions for how Hydrogen decarbonises the parts of the energy system that electricity can't reach are live and being invested in. These include global shipping, steel production and fertiliser production amongst others. Thinking about UK solutions to UK problems in a particular way that means we can tack on a few jobs in the supply chain in SME's is really not going to cut it. When you think about the scale of opportunity decarbonisation presents, that is a staggeringly unambitious goal and probably means we will be overtaken by solutions from around the world much like the first phase of wind deployment.

Ceres Power's business model means we are reaching out to those advanced hydrogen economies to harvest value created in SME's and the UK Science Infrastructure over the past decade. We have partners in all of those leading markets: Korea, Germany, Japan, China and have attracted £150 million in Foreign Direct Investment in the last 2 years alone. Ceres harvests that value back to the UK, to create really high value science and engineering jobs working at the cutting edge of industrialising materials science. Ceres has commercial proof that the UK can succeed in providing tangible solutions to a global problem solved in the UK.

ceres

https://www.ceres.tech/
Mark.Selby@cerespower.com

AN OVERVIEW OF HYDROGEN PROJECTS

NOVEMBER SPEAKER MEETING

Heidi Genoni, CEng, Project Manager, Arup

INTRODUCTION

The scale of the task facing us to achieve net zero and completely decarbonise the UK energy system is enormous. However, it is entirely possible with government decision making and backing.
Hydrogen has an important strategic role.
Look at the role hydrogen could play in heat.

ENERGY CONSUMPTION CONTEXT

It is important to understand how and what we currently use our energy for, to better understand the challenges that we must overcome:

- Currently, only about ⅙ of our total energy comes to us via the electricity network,
- About a ⅓ comes in oil and liquid form for transport fuels,
- About ½ comes via the gas network.

Whilst an excellent start has been made with decarbonising the electricity grid, even on a windy and sunny day, renewables still only represents about 15% of energy used.

Even if we were to double the capacity of the electricity network (e.g. which would include more power cables in the roads and electricity pylons), we would still need the gas network to distribute the energy we consume.

The CCC (Committee in Climate Change) and the National Grid Future Energy Scenarios work also agree that hydrogen has an important part to play.

LOOKING AT HYDROGEN FOR HEATING

UK is a temperate climate, a lot of our energy, is used for heating our homes and buildings especially in winter months. This is about HALF of all energy consumption, which contributes to about a THIRD of all carbon emissions. And ~80% of our circa ~23 million homes use gas for heating and cooking. We need to find a way to decarbonise our homes easily, quickly and cheaply. Much of the existing housing / building stock is likely to still be around in 2050. There can be particularly challenging and where hydrogen could play an important role. New build may have different solutions. BEIS is funding an innovation programme called Hy4Heat – exploring if it is feasible to use hydrogen gas in the existing gas network instead of natural gas (methane). This programme is well underway, and much progress has been made in a relatively short period of time. Example of good collaboration between government and industry. So far research studies into the commercial and industrial market suggest that hydrogen gas use is feasible and that there are no technical barriers. These reports, along with others have been published on the Hy4Heat website. https://www.hy4heat.info/reports

Development of a range of domestic technologies (hydrogen gas, boilers, cookers and gas fires) are progressing well. Recent news - the Hy4Heat Worcester Bosh and Baxi boilers have

successfully been installed and are operational - heating some empty homes - up in a test site in Spadeadam, Northumberland.

Appliances developed in Hy4Heat are **'hydrogen-ready'**. Essentially meaning that they can operate on natural gas, and can operate on hydrogen gas, with a small component part change. Definition has been defined further by the HHIC (Heating and Hotwater Industry Council). This has potential to support the ease of conversion from a consumer perspective. Equally, the appliances are very similar to existing appliances (wonderfully boring!).The Hy4Heat programme is continuing to progress on time / schedule and the safety assessment evidence is undergoing an independent review from the HSE.

WHAT NEXT

We don't have to wait for all the answers on conversion of the gas grid to 100% hydrogen, because through projects like HyDeploy we have already seen that up to 20% hydrogen can be blended safely into the gas distribution network with no impact on end consumers. This could be a good way to start the decarbonisation of the gas grid, by balancing and building up the supply and demand of hydrogen in tandem. It's possible to imagine, if hydrogen were to be in the in the gas network, distributed around communities and streets, that it could be feasible, with some further innovation, to extract the hydrogen, that it could then also be used for transport. Whether that be road, rail, shipping, air travel etc.

ACTUAL PIPELINE PROJECTS TO GET GOING

- HyNet - blue hydrogen with CCUS, to provide the energy for industrial purposes and to start to blend hydrogen in the gas network
- Zero Carbon Humber project and H21 looking to do similar in the North East
- Teeside
- Merseyside
- Bacton and Hydrogen East
- Project Cavendish - London and re-use of the Isle of Grain
- Fife, Scotland – green hydrogen and full hydrogen gas network
- Etc.

CONCLUSION

Activity in parallel:

- Reduce – the amount of energy we use
- Reuse the existing gas network - whilst hydrogen is not a silver bullet, it will still have an important part play in future energy systems
- Transition needs to be a smooth and fast as possible – therefore 'hydrogen-ready' and blending can support
- Innovation funding – needs to continue, to drive down costs
- Demonstrations – to showcase tangible benefits
- Integrated vision and plan – energy cuts across all sectors

ARUP

https://www.arup.com/projects/hy4heat
Heidi.genoni@arup.com

CLEAN ENERGY FOR A CLEAN WORLD

NOVEMBER SPEAKER MEETING

Tim Harper, CEO, Element 2

- What is Element 2 Ltd?
  - o E2 Breaks the chicken/egg situation with hydrogen for transport
  - o Addresses supply/demand synchronicity issue
  - o Targeting freight transport not passenger vehicles
  - o Focus on North & Scotland
  - o Aims to build 2000 Hydrogen Refuelling Stations by 2030

- Our USP
  - o Uses the best available technology to create refuelling stations
  - o Not dependent on fuel cell vehicles – we also supply to converted vehicles
  - o Range of H2 supplies to provide best balance of green and cost
  - o Management team from fuel cells, energy supply and policy

- Transport Demand Stimulates supply side technologies
  - o "It's bang for buses and grunt for trucks"
  - o Acting now to accelerates uptake rather than responding to the market
  - o Accelerates move from grey/blue to green
    - E.g., offshore wind, waste to hydrogen from plastics, biogas

- Transport is an early application that addresses Net Zero
  - o Fleet conversion is an intermediate step
  - o Local Benefits
    - Early adopters in local government
      - Leads to fleet conversions
      - 350,000 HGVs saving 785 million tonnes of CO2 by 2025
  - o National Benefits
    - Addresses decarbonisation of transport objectives
    - Progress to Net Zero

- Policy Ask
  - o Subsidise vehicle conversions not fuel
    - Provides an incentive for fleet conversions not wholesale replacement
    - Gradual shift to H2 more financially attractive to operators
    - Local vehicle conversions create jobs and expertise in the UK, and stimulate local H2 economies
    - Early start enables the UK to become a global leader in the hydrogen for transport sector while others wait for FCEVs and green hydrogen

HYDROGEN NEEDS TO BE PART OF THE UK'S FUTURE ENERGY MIX

NOVEMBER SPEAKER MEETING

Dr. Angela Needle, Director of Strategy, Cadent Gas Limited

The Net Zero energy system of 2050 will look very different from today's energy system. We will no longer burn coal, oil and gas to generate electricity and power industrial processes, cars will no longer run on petrol and diesel and our homes will no longer be heated by natural gas. In 2050, most of our electricity will be generated from renewable sources, many industrial processes will switch to electricity, most of our cars will run on batteries and many of our homes will be heated by electric heat pumps.

But electrification won't to be the whole answer. Renewables are unlikely to meet all our power needs, some industrial processes can't be electrified; batteries not for all vehicles; and heat pumps not for all homes. Green gas – in particular hydrogen – will have an important role to play in all these areas. Hydrogen also has the potential to provide valuable energy system flexibility, helping to manage inter-seasonal supply and demand imbalances and build system resilience.

THE POTENTIAL FOR HYDROGEN

Most commentators agree that hydrogen will be important in the future energy system. In its 2019 report which prompted the Government to make its Net Zero commitment, the Committee on Climate Change (CCC) said that "by 2050, a new low-carbon industry is needed with UK hydrogen production capacity of comparable size to the UK's current fleet of gas-fired power stations."

However, there is not yet a consensus on the scale and scope of hydrogen's role versus other potential solutions. Particularly in heating buildings, where electric heat pumps and district heating networks are also plausible options alongside, and possibly instead of, hydrogen.

Cadent believe hydrogen's exact role will ultimately be determined by three things,

- **Feasibility:** Is it technically feasible and safe to transport and use hydrogen?
- **Economics:** How do the economics of hydrogen compare to the alternatives?
- **Consumers:** What are consumers' (in particular householders) preferences for hydrogen versus alternatives?

FEASIBILITY

Hydrogen has many advantages as an energy source. It is easily made, safe, storable, transportable and can produce energy with zero emissions at the point of use. For hydrogen to be accepted fully

by policy makers and the general public, further work needs to be done to strengthen the evidence base, in particular concerning its safety in the home.

Cadent and the wider gas sector are actively leading and funding a broad range of hydrogen-focused innovation projects and programmes. Activity is primarily focusing on the following six areas:

1. **Home safety:** Is it safe to use in the home?
2. **Network safety:** Can it be safely transported in the gas network?
3. **Blending:** Can blended hydrogen be used with existing infrastructure and appliances?
4. **Household switchover:** How will homes switch over to hydrogen in practice?
5. **System operation:** How will gas system operation need to evolve to handle hydrogen?
6. **Industrial conversion:** How will industry convert to hydrogen in practice?

A BALANCED ENERGY SYSTEM

Multiple studies have concluded that a balanced energy system incorporating hydrogen in transport (for heavy goods vehicles), industry (for high grade heat), power (for peak generation dispatchable power) and buildings (alongside electric heat pumps and heat networks) is likely to have the lowest whole system cost. For example, Navigant's 2019 'Pathways to Net Zero' study concluded that whole system costs would be £13 billion cheaper per annum for a balanced scenario versus full electrification

However, while the bulk of analysis on future energy system costs published to date points to balanced energy systems incorporating hydrogen having the lowest whole system costs, the differences between scenarios (in relative terms) is small and it is important to acknowledge this when drawing conclusions. It should also be remembered that whole energy system cost modelling is highly sensitive to assumptions such as production costs, network upgrade requirements and household switchover costs.

Given these caveats, economics alone are unlikely to be the deciding factor in determining the UK's optimum Net Zero energy system. In particular, consumer attitudes and behaviours will play an important role. This is particularly true in relation to buildings, where millions of individual homeowners will have to make potentially disruptive changes to their existing home heating systems. Hydrogen, heat pumps, hybrid boilers and heat networks are all viable options for homeowners currently on the gas network, but all come with their own pros and cons and offer different user experiences.

In many cases homeowners will ultimately have the power to decide which low-carbon heating solution to install, but in spite of this there has been limited focus on homeowners in the Net Zero debate to date. Recent experience of home insulation grants, the smart meter roll-out and the Green Deal shows how easily a lack of consumer engagement and customer 'apathy' can derail government policy.

From Cadent's review of existing research into consumer attitudes towards heating, we have identified three key themes:

- **Disruption:** Challenges faced by the Eco scheme (which provided grants to homeowners to install loft insulation and other energy efficiency measures) and the smart meter roll-out give a real sense of how much homeowners dislike disruption. In both cases, homeowners were essentially offered free upgrades to their homes with demonstrable energy- and cost-saving benefits, and yet uptake was low, even following extensive marketing campaigns and outreach. This aversion to disruption could potentially have a significant bearing on consumers' preferred low-carbon heating solutions.

- **User experience:** Most consumers place significant value on heating solutions that provide good quality, on-demand heat and that are operated in a way they are familiar with. In our Bright Blue research, 86% of consumers said it was very important or quite important to be able to heat up their home whenever they like; 84% said it was very important or quite important to be able to heat up their home quickly; and 77% said it was very important or quite important to have a heating system that is familiar to them.

- **Cost:** Unsurprisingly, studies have consistently concluded that minimising cost is high on consumers' list of heating priorities. While consumers want to both minimise the up-front cost of new heating solutions and reduce ongoing heating bills, they tend to place far greater emphasis on minimising up-front costs, even if this means higher lifetime costs.

A comparison of the main low-carbon heating solutions for domestic heating suggests that hydrogen boilers cause the least disruption, offer the best user experience and have the lowest up-front switching cost. Hybrid hydrogen/heat pump solutions are slightly more disruptive but also score highly on user experience. Heat pumps are the most disruptive, score worst on user experience and have the highest up-front switching cost, especially where significant energy efficiency upgrades are needed. This suggests that, given the choice and all else being equal, many consumers may favour hydrogen boilers.

NEXT STEPS TO DEVELOP THE HYDROGEN ECONOMY

Cadent believe the following measures will be required to stimulate the hydrogen economy:

- Incentivising hydrogen supply, potentially through a Contracts for Difference (CfD) Mechanism, similar to offshore wind.
- Underpinning investment in Carbon Capture and Storage (CCUS) technology
- Mandating the rollout and installation of hydrogen-ready boilers
- Enable hydrogen-blending into the network for a no-regrets, carbon reduction method
- Establishment of low-carbon obligations
- Creating a hydrogen-ready distribution network
- Updating the Gas Safety Management Regulations (GSMR)

Developing a hydrogen economy and delivering Net Zero will only be possible with policy and regulatory certainty. Businesses and investors need it to be confident that their investments will deliver a reasonable return for risk. And consumers need it to be confident in upgrading their heating systems with potentially costly and disruptive Net Zero solutions.

HOW RENEWABLE POWER IS DEFYING THE COVID-19 CRISIS

DECEMBER SPEAKER MEETING

Dr Fatih Birol, Executive Director, International Energy Agency

KEY FINDINGS FROM THE IEA'S RENEWABLES 2020 MARKET REPORT

The Covid-19 crisis has caused major turmoil in the global energy sector, with fossil fuels like coal and oil experiencing significant plunges in demand and investment. But renewable power technologies like solar, wind and hydro are defying the difficulties caused by the pandemic with a record increase in new capacity this year that is set to accelerate further next year.

These encouraging trends for clean energy transitions show that the renewables industry has adapted quickly to the challenges brought by the coronavirus, especially in the power sector. Supply chain disruptions and construction delays slowed the progress of renewable energy projects in the first six months of 2020. But construction of plants and manufacturing activity have ramped up again quickly, and logistical challenges have been mostly resolved with the easing of cross-border restrictions.

The key numbers in the International Energy Agency's recent Renewables 2020 report highlight how strongly renewable power is performing in a year when overall energy demand and investment worldwide are set for drops of historic proportions. Although it also warns that renewables are struggling in critical areas beyond the power sector, such as transport, industry and buildings, requiring urgent policy action.

Driven by China and the United States, renewable power capacity additions are set to rise by 4% this year, accounting for almost 90% of the overall increase in power capacity worldwide. This increase in capacity has helped underpin an increase of almost 7% in renewable power generation in 2020. By contrast, coal-fired power generation is expected to fall 5% over the same period. Next year, we expect renewable capacity additions to jump 10% – the fastest growth since 2015 – led by India and the European Union.

The resilience and bright prospects of the sector are clearly reflected by continued strong appetite from investors. Over the first 10 months of 2020, China, India and the European Union have driven auctioned renewable power capacity worldwide 15% higher than in the same period last year – a new record that shows expectations of strong demand for renewables over the medium and long term.

Solar is becoming the new king of the world's electricity markets, ascending to the throne thanks to its constantly improving competitiveness. Even faster deployment is possible from 2022 onward,

hinging on new policies in China and the United States – and developments in the rooftop solar industry globally.

Wind power generation is forecast to increase by 80% in the next five years, driven by China, the United States and the European Union. Offshore wind is set for particularly impressive growth, thanks to rapid cost declines. The annual offshore wind market is set to more than double by 2025, with expansion shifting beyond Europe to Asia and the United States.

Our report indicates that total wind and solar power capacity is on course to surpass that of natural gas in 2023 and of coal in 2024. The growing capacity will take the amount of renewable electricity produced globally to new heights.

In 2025, renewables are set to become the largest source of electricity generation worldwide, ending coal's five decades at the top of the global power mix. By that time, renewables are expected to supply one-third of the world's electricity – and their total capacity will be twice the size of the entire power capacity of China today.

Although renewables are resilient to the Covid-19 crisis, they remain vulnerable to policy uncertainties. Governments still need to act to support the strong momentum we are seeing at the moment. In the United States, for instance, if the proposed clean electricity policies of the next US administration are implemented, they could lead to a much more rapid deployment of solar and wind, contributing to a faster decarbonisation of the power sector.

Unfortunately, the picture is much less rosy for renewables outside the power sector. This is concerning because IEA analysis shows that decarbonising the power sector globally would only get the world one-third of the way to reaching net-zero emissions. Much greater and faster progress is required in sectors like transport, industry and buildings, where the use of renewable electricity can address some but not all of the emissions.

Another key area is modern bioenergy, which can reduce long-term annual emissions by almost one-fifth by directly replacing fossil fuels and offsetting emissions in combination with carbon capture, utilisation and storage (CCUS).

To meet global energy and climate goals, modern bioenergy would need to triple. But bioenergy and biofuels have both hit by both low fuel demand and low oil prices. Our Renewables 2020 market analysis shows that biofuels output is expected to drop by almost 12% in 2020 – the first decline in two decades. And demand for bioenergy in industry is also falling as a result of the wider drop in economic activity.

Meanwhile, renewables are not growing quickly enough in the provision of heat to buildings and industry. Global renewable heat consumption is projected to be 20% higher in 2025 than it was in 2019, with a stronger increase in the buildings sector than in industry. Despite this rise, renewables are on course to represent only 12% of global heat consumption by 2025, barely changed from 2020, as the overall market is expected to expand, driven by industrial activity.

Without a significant change in non-renewable heat consumption, total heat-related CO2 emissions in 2025 are expected to be only 2% lower than in 2019.

Countries can accelerate renewables' growth by giving them a larger share of economic recovery spending, especially those areas that have been hit hard by the crisis, such as biofuels in transport, renewable heat and rooftop solar. For example, the liquid biofuels industry is a critical employer of both low and high skilled workers across many countries. We estimate that each million dollars of investment would create around 15-30 jobs, a significant proportion of which would be in rural areas.

As the world's energy authority, the IEA is committed to supporting governments' efforts to accelerate global clean energy transitions through increased deployment of renewables and other key technologies. Our recent report on power systems in transition provided valuable insights into how countries can securely and cost-effectively increase the share of variable renewables like solar and wind in their electricity supply while guarding against risks from cyber threats and more extreme weather caused by climate change.

The IEA is determined to lead clean energy transitions around the world – and that is what we are doing with our analysis, with our policy recommendations, with our work on the ground helping governments put policies into action.

https://www.iea.org/reports/renewables-2020

OBITUARY

THE LORD MARTIN O'NEILL OF CLACKMANNAN

BORN 6 JANUARY 1945; DIED 26 AUGUST 2020

Lord O'Neill engaging the membership at one of the many PGES functions he attended. Martin was an active member of PGES and served on Executive Council for many years.

Lord O'Neill was a long serving Executive Council member of the PGES. He was always approachable and friendly, offering sage advice to non-parliamentarians.

A member of the House of Lords until his death, O'Neill also served as a Labour MP for over quarter of a century from 1979 to 2005, when he was elevated to the Peerage.

Martin never lost his love for football, especially "Hibs", who he started supporting when a boy growing up in Edinburgh. The club hailed him as a "lifelong supporter" .

Having started out as an insurance clerk, Martin O'Neill went on to become an economics teacher at Boroughmuir and Craigmount high schools before entering politics. Then after six years as an MP, he was appointed shadow defence spokesman under Neil Kinnock. When he stepped away from the front bench, he was appointed chairman of the trade and industry select committee in 1995.

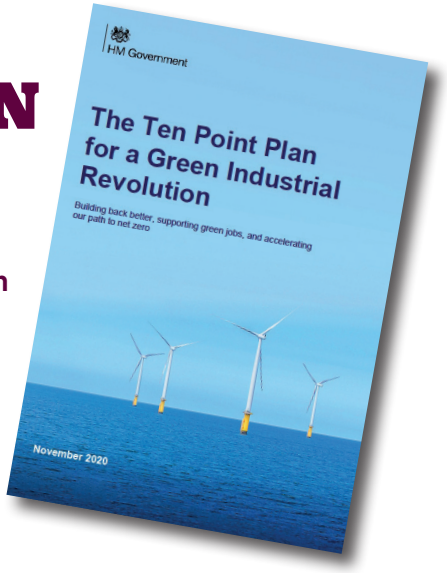
Martin favoured a balanced energy policy that included nuclear power – he later became president of the Nuclear Industry Association. He also served as Chairman of the Strategic Forum for Construction and received an Honorary Doctorate from Heriot-Watt University in 2011[7] and was an honorary associate of the National Secular Society.

Martin died peacefully after a long struggle against prostate cancer, on Thursday, August 27, 2020, at the Western General Hospital.

We will always remember him with huge affection, he will be sorely missed by the Group.

A personal note from the editor, on first meeting Martin, he explained a few of the more choice parliamentary terms and traditions! He has been described as able, amiable and straight talking – this took on a new meaning. Martin was a very personable and approachable Peer who cared about energy policy.

THE 10 POINT PLAN FOR A GREEN REVOLUTION



On 18th November, Prime Minister Boris Johnson announced his 10 Point Plan for a Green Industrial Revolution, setting out the approach government will take to build back better, support green jobs, and accelerate our path to net zero.

As the world looks to recover from the impact of coronavirus on our lives, livelihoods and economies, we have the chance to build back better: to invest in making the UK a global leader in green technologies.

The plan focuses on increasing ambition in the following areas:

1. **Offshore wind:** Producing enough offshore wind to power every home, quadrupling how much we produce to 40GW by 2030, supporting up to 60,000 jobs.
2. **Hydrogen:** Working with industry aiming to generate 5GW of low carbon hydrogen production capacity by 2030 for industry, transport, power and homes, and aiming to develop the first town heated entirely by hydrogen by the end of the decade.
3. **Nuclear:** Advancing nuclear as a clean energy source, across large scale nuclear and developing the next generation of small and advanced reactors, which could support 10,000 jobs.
4. **Electric vehicles:** Backing our world-leading car manufacturing bases including in the West Midlands, North East and North Wales to accelerate the transition to electric vehicles, and transforming our national infrastructure to better support electric vehicles.
5. **Public transport, cycling and walking:** Making cycling and walking more attractive ways to travel and investing in zero-emission public transport of the future.
6. **Jet Zero and greener maritime:** Supporting difficult-to-decarbonise industries to become greener through research projects for zero-emission planes and ships.
7. **Homes and public buildings:** Making our homes, schools and hospitals greener, warmer and more energy efficient, whilst creating 50,000 jobs by 2030, and a target to install 600,000 heat pumps every year by 2028.
8. **Carbon capture:** Becoming a world-leader in technology to capture and store harmful emissions away from the atmosphere, with a target to remove 10MT of carbon dioxide by 2030, equivalent to all emissions of the industrial Humber today.
9. **Nature:** Protecting and restoring our natural environment, planting 30,000 hectares of trees every year, whilst creating and retaining thousands of jobs.
10. **Innovation and finance:** Developing the cutting-edge technologies needed to reach these new energy ambitions and make the City of London the global centre of green finance.

The ten-point plan will mobilise £12 billion of government investment and potentially 3 times as much from the private sector, to create and support up to 250,000 green jobs.

These tie in with the strategy put forward by the Secretary of State Alok Sharma for the run up to CoP26, with 5 pillars of focus: Nature based solutions; Clean energy; Clean transport; Adaptivity; Green Finance.

UK NATIONALLY DETERMINED CONTRIBUTION ANNOUNCED

On 4th December, the Prime Minister announced the United Kingdom's Nationally Determined Contribution (NDC) as part of the Paris Agreement at the Conference of the Parties (CoP21). The plan aims for at least 68% reduction in greenhouse gas emissions by the end of the decade, compared to 1990 levels.

The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at COP 21 in Paris, on 12 December 2015 and entered into force on 4 November 2016. Its goal is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.

The central element for implementing the Paris Agreement are the NDCs of each Party. NDCs are national climate plans highlighting climate actions, including climate related targets, policies and measures governments aims to implement in response to climate change and as a contribution to global climate action. Central to the NDCs is the concept of national determination.

"Recognising the urgency to go further to tackle climate change, the UK's new target to reduce greenhouse gas emissions – our Nationally Determined Contribution (NDC) under the Paris Climate Agreement – is among the highest in the world and commits the UK to cutting emissions at the fastest rate of any major economy so far.

The target is the first set by the UK following its departure from the EU, demonstrating the UK's leadership in tackling climate change. Over the past decade, the UK has cut carbon emissions by more than any similar developed country and was the first major economy to legislate for net zero emissions by 2050."

6TH CARBON BUDGET

On 9th December, Chis Stark, Chief Executive of the Committee on Climate Change announced the 6th Carbon Budget.
This is required under the Climate Change Act, provides ministers with advice on the volume of greenhouse gases the UK can emit during the period 2033-2037.

Lord Deben, Chairman of the Committee on Climate Change (CCC) had previously sent a letter to the Secretary of State for Business, Energy and Industrial Strategy setting out the requirements for the UK to meet its pledge to be Net Zero by 2050.

6TH CARBON BUDGET - KEY RECOMMENDATIONS

The CCC recommended pathway requires a 78% reduction in UK territorial emissions between 1990 and 2035. In effect, bringing forward the UK's previous 80% target by nearly 15 years.

The Sixth Carbon Budget can be met through four key steps:

- Take up of low-carbon solutions. People and businesses will choose to adopt low-carbon solutions, as high carbon options are progressively phased out. By the early 2030s all new cars and vans and all boiler replacements in homes and other buildings are low-carbon – largely electric. By 2040 all new trucks are low-carbon. UK industry shifts to using renewable electricity or hydrogen instead of fossil fuels, or captures its carbon emissions, storing them safely under the sea.
- Expansion of low-carbon energy supplies. UK electricity production is zero carbon by 2035. Offshore wind becomes the backbone of the whole UK energy system, growing from the Prime Minister's promised 40GW in 2030 to 100GW or more by 2050. New uses for this clean electricity are found in transport, heating and industry, pushing up electricity demand by a half over the next 15 years, and doubling or even trebling demand by 2050. Low-carbon hydrogen scales-up to be almost as large, in 2050, as electricity production is today. Hydrogen is used as a shipping and transport fuel and in industry, and potentially in some buildings, as a replacement for natural gas for heating.
- Reducing demand for carbon-intensive activities. The UK wastes fewer resources and reduces its reliance on high-carbon goods. Buildings lose less energy through a national programme to improve insulation across the UK. Diets change, reducing our consumption of high-carbon meat and dairy products by 20% by 2030, with further reductions in later years. There are fewer car miles travelled and demand for flights grows more slowly. These changes bring striking positive benefits for health and well-being.
- Land and greenhouse gas removals. There is a transformation in agriculture and the use of farmland while maintaining the same levels of food per head produced today. By 2035, 460,000 hectares of new mixed woodland are planted to remove CO2 and deliver wider environmental benefits. 260,000 hectares of farmland shifts to producing energy crops. Woodland rises from 13% of UK land today to 15% by 2035 and 18% by 2050. Peatlands are widely restored and managed sustainably.

CLIMATE AMBITION SUMMIT

The Climate Ambition Summit was held on 12th December, for leaders of the United Nations countries, in preparation for CoP26 next year.

Below are some extracts from the closing remarks by the CoP26 President, The Rt Hon Alok Sharma MP, Secretary of State for Business, Energy and Industrial Strategy

"We have come to the end of the Climate Ambition Summit and today we have seen countries from across the world making commitments of increased ambition towards tackling climate change.

75 leaders have come together to announce new commitments to climate action. We have had 45 Nationally Determined Contributions, 24 net zero commitments, and 20 adaptation and resilience plans. Responding to the calls for action from youth, business, indigenous peoples and civil society, leaders have put their countries on course for the green growth, which we have seen is possible, creating jobs and prosperity. The commitment is truly global and it encompasses all of society.

Global companies have made net zero commitments and the Net Zero Asset Managers Initiative, launched just yesterday, already covers nine trillion dollars of assets. I am enormously grateful to all those who have come forward with announcements today."

"...have we done enough to put the world on track to limit warming to 1.5 degrees, and protect people and nature from the effects of climate change?

To make the Paris Agreement a reality, we must be honest with ourselves, the answer to that is currently: no. As encouraging as all this ambition is, it is not enough - and the clock continues to tick.

As our Barbadian friends have said today: our window to end the crisis is closing. This is a fight for the very survival of our fragile planet, we are facing a scale of human tragedy and natural devastation the world has never seen. The choices we make in the year ahead will determine whether we unleash a tidal wave of climate catastrophe on generations to come.

But the power to hold back that wave rests entirely with us, now. If the Paris Agreement was the dawn of an age of hope for our planet, now must be the time for increased ambition and action.

The coronavirus pandemic has demonstrated that our fates are intertwined. The progress on vaccines has shown what we can accomplish when the world unites against a common threat. And this should give us all hope.

And over the next year, I want us to unite against climate change, build a consensus, and broker an agreement around four key goals. First, a step change in mitigation. Second, a strengthening of adaptation. Third, getting finance flowing. And fourth, enhancing international collaboration."

"...My friends, I am aware of the scale and the gravity of the task that I have been given as the custodian of this process. But I also recognise, that success in Glasgow will depend on all of us.

It will not be easy, but it is possible and it is urgent. As leaders of today, we carry a heavy responsibility. Whether future generations look back at this time, with admiration, or despair, depends entirely on our ability to seize this moment, to build on the ambition we have seen today and to work together over the next year, to forge a brighter future for us all.

Because in decades to come, each and every one of us, will need to be able to look future generations square in the eye, and say, that together, when the urgency of our time demanded it, we built a better world, for their sakes, and for their future generations."

ENERGY WHITE PAPER ANNOUNCED

14TH DECEMBER

Building on the Prime Minister's Ten Point Plan for a Green Industrial Revolution, the Energy White Paper sets out specific steps the government will take over the next decade to cut emissions from industry, transport, and buildings by 230 million metric tonnes – equivalent to taking 7.5 million petrol cars off the road permanently – while supporting hundreds of thousands of new green jobs.

Core parts of the Energy White Paper backing our ambitious plans include:

- Supporting up to 220,000 jobs in the next 10 years. This includes long-term jobs in major infrastructure projects for power generation, carbon capture storage and hydrogen, as well as a major programme of retrofitting homes for improved energy efficiency and clean heat.
- Transforming the UK's energy system from one that was historically based on fossil fuels to one that is fit for a net zero economy, changing how we heat our homes and travel, doubling our electricity use, and harnessing renewable energy supplies.
- Keeping bills affordable for consumers by making the energy retail market truly competitive. This will include offering people a simple method of switching to a cheaper energy tariff, and testing automatically switching consumers to fairer deals to tackle "loyalty penalties".
- Generating emission-free electricity by 2050 with a trajectory that will see us have overwhelmingly decarbonised power in the 2030s. Low carbon electricity will be a key enabler of our transition to a net zero economy with demand expected to double due to transport and low carbon heat.
- Establishing a UK Emissions Trading Scheme (UK ETS) from 1 January 2021 to replace the current EU ETS at the end of the Transition Period. It increases ambition on reducing emissions, and provides continuation of emissions trading for UK businesses and certainty on how they operate.
- Continuing to explore a range of financing options for new nuclear with developers including the Regulated Asset Base (RAB) funding model, which could help secure private investment and cost consumers less in the long run. Given the scale of the financing challenge, we will also consider the potential role of government finance during construction, provided there is clear value for money for consumers and taxpayers.
- Delivering ambitious electricity commitments through our world-beating commitment to deliver 40GW of offshore wind by 2030, including 1GW of floating wind, enough to power every home in the country – while attracting new offshore wind manufacturers to the UK.

- Investing £1 billion in state-of-the-art carbon capture storage in four industrial clusters by 2030 – sucking carbon out of industrial processes to stop emissions escaping to the air. Four low carbon clusters will be set up by 2030, and at least one fully net zero cluster by 2040, stimulating the market to attract new investors and manufacturers to reinvigorate our industrial heartlands.
- Kick-starting the hydrogen economy by working with industry to aim for 5GW of production by 2030, backed up by a new £240m net zero Hydrogen Fund for low carbon hydrogen production.
- Investing £1.3 billion to accelerate the rollout of charge points for electric vehicles in homes, streets and on motorways as well as up to £1 billion to support the electrification of cars, including for the mass-production of the batteries needed for electric vehicles. The rollout has levelling up at its heart, and will support economic growth across the UK - including in our strong manufacturing bases in the Midlands and the North East - while supporting the 169,000 jobs in our world-leading automotive sector.
- Supporting the lowest paid with their bills through a £6.7 billion package of measures that could save families in old inefficient homes up to £400. This includes extending the Warm Home Discount Scheme to 2026 to cover an extra three quarters of a million households and giving eligible households £150 off their electricity bills each winter. The £2 billion Green Homes Grant announced by the Chancellor has been extended for a further year in the Ten Point Plan.
- Moving away from fossil fuel boilers, helping to make people's homes warmer, whilst keeping bills low. By the mid-2030s we expect all newly installed heating systems to be low carbon or to be appliances that we are confident can be converted to a clean fuel supply.
- Supporting North Sea oil and gas transition for the people and communities most affected by the move away from oil and gas production, ensuring that the expertise of the oil and gas sector be drawn on in developing carbon capture and storage and hydrogen production to provide new green jobs.

PARLIAMENTARY RECORD

SELECT COMMITTEE STATEMENTS, REPORTS AND INQUIRIES

1st September 2020 – 17th December 2020

House of Commons

Business, Energy and Industrial Strategy Committee

Darren Jones, BEIS Committee Chair, said: "The BEIS Committee will be keen to examine the clarity, scope and deliverability of the Energy White Paper's ambitions in our evidence session on 12 January and in our decarbonising heat inquiry later in the New Year." **The Business, Energy and Industrial Strategy Committee will be holding an evidence session examining the Energy White Paper on the morning of Tuesday 12 January 2021.**

Post-pandemic economic growth inquiry. Opened 3rd June 2020.
On 25th June, oral evidence was taken from Diane Coyle, Bennett Professor of Public Policy at University of Cambridge and Mariana Mazzucato Director of UCL Institute for Innovation & Public Purpose; Professor of Economics of Innovation & Public Purpose at University College London.

Post-pandemic economic growth: Industrial Strategy inquiry. Opened 23rd July 2020
Oral evidence was taken on 8th October from Peter Ellingworth, Chief Executive Officer at Association of British HealthTech Industries; Anthony Walker, Deputy Chief Executive Officer at techUK; Guy Newey, Director of Strategy and Performance at Energy Systems Catapult; Nick Owen, Co-Chair at Professional and Business Services Council; Stephen Phipson CBE, Chief Executive at Make UK; Paul Everitt, Chief Executive at ADS Group; Gareth Stace, Director General at UK Steel and Mike Hawes, Chief Executive at Society of Motor Manufacturers and Traders.

On 15th December, from Catherine Lewis La Torre, Chief Executive Officer at British Business Bank; James Wise, Partner at Balderton Capital and Irene Graham, Chief Executive Officer at ScaleUp Institute

Post-pandemic economic growth: Levelling Up inquiry. Opened 24th July 2020
Oral evidence was taken on 1st October from Mark Bretton, Chair at The LEP Network; Councillor Sue Baxtor, Chairman at National Association of Local Councils and Councillor Susan Hinchcliffe, Vice Chair of the City Regions Board at Local Government Association. Stuart Elford, Chief Executive Officer at Devon Chamber of Commerce; Chris Fletcher, Campaigns Director at Greater Manchester Chamber of Commerce; Louise Bennett OBE DL, Chief Executive Officer at Coventry and Warwickshire Chamber of Commerce and Sandy Needham DL, Chief Executive Officer at West and North Yorkshire Chamber of Commerce

On 22nd October, from Andy Burnham, Mayor of Greater Manchester; Tim Bowles, Mayor at West of England Combined Authority; Jamie Driscoll, Mayor at North of Tyne Combined Authority and Steve Rotherham, Mayor of Liverpool City Region.

On 24th November, from Henri Murison, Director at Northern Powerhouse Partnership; The Lord Kerslake; Katherine Bennett, Chair at Western Gateway; Rachael Greenwood, Director at Midlands Engine. Marvin Rees, Mayor at Bristol City Council; Andrew Carter, Chief Executive at Centre for Cities; Rokhsana Fiaz, Mayor at Newham Council; Sir Peter Soulsby, previously MP for Leicester South and Mr Duncan Simpson, Research Director at Taxpayers' Alliance

Decarbonising heat in homes. Opened 2nd October 2020.
The BEIS Committee will examine the Government's 'Buildings and Heat Strategy', due in November, and investigate the policies, priorities and timelines which are needed to decarbonise heating in residential buildings and help ensure the UK gets on track to deliver Net Zero by 2050.

The Committee's inquiry on decarbonising heat follows a successful pitch by Dr Jan Rosenow, Principal and European Programme Director, Regulatory Assistance Project (RAP), at the Committee's "MyBEIS" evidence hearing in July and is part of the BEIS Committee's ongoing work on net zero and its follow-up to the findings of the Climate Assembly.

The decarbonising heat in homes inquiry is likely to examine areas such as the technological challenges to decarbonising heat including issues related to the future of hydrogen, network capacity and the distribution of costs, incentives, consumer engagement and protection and how to co-ordinate and deliver low-carbon heating.

Net zero and UN climate summits. Opened 6th March 2020
On 1st December, oral evidence was taken from Claire O'Neill, Managing Director, Climate & Energy at World Business Council for Sustainable Development. Pete Betts, Associate Fellow at Chatham House, and Professor of Practise at Grantham Research Institute on Climate Change and the Environment, LSE; Dr Emily Shuckburgh OBE, Director at Cambridge Zero, University of Cambridge, and Reader of Environmental Data Science at University of Cambridge; Farhana Yamin, Chief Executive Officer at Track 0, Vice-Chair at Climate Vulnerable Forum Expert Advisory Group, and Senior Advisor at SYSTEMIQ and Dr Jennifer Allan, Lecturer in International Relations at University of Cardiff

Science and Technology Committee

The role of technology, research and innovation in the CoVid-19 recovery

Written evidence has been published.

The role of hydrogen in achieving Net Zero. Opened
A key component of the Government's recently announced 'Ten Point Plan for a Green Industrial Revolution' is 'Driving the Growth of Low Carbon Hydrogen'. The plan outlined a range of measures to support the development and adoption of hydrogen, including a £240 million 'Net Zero Hydrogen Fund'. Noting this, and the further £81 million allocated for hydrogen heating trials in the 2020 Spending Review, the House of Commons Science and Technology Committee is today launching a new inquiry into the **role of hydrogen in achieving Net Zero. This inquiry is currently accepting evidence until Friday 8 January 2021.**

PARLIAMENTARY RECORD

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Climate Change: International Co-operation
Dr Luke Evans (Bosworth) (Con)
Andrew Jones (Harrogate and Knaresborough) (Con)
Jerome Mayhew (Broadland) (Con)
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Marine Energy Sector
Sally-Ann Hart (Hastings and Rye) (Con)

Automotive Sector: Environmentally Sustainable Recovery
Joy Morrissey (Beaconsfield) (Con)
Karl McCarthy (Lincoln) (Con)
Nick Fletcher (Don Valley) (Con)
Dr Alan Whitehead (Southampton, Test) (Lab)

Merseyside: Sustainable Energy Production
Paula Barker (Liverpool, Wavertree) (Lab)

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Mike Hill (Hartlepool) (Lab)

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Marine Renewable Energy
Ruth Jones (Newport West) (Lab)
Sizewell C
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Felicity Buchan (Kensington) (Con)
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Tony Lloyd (Rochdale) (Lab)
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Jacob Young (Redcar) (Con)
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Duncan Baker (North Norfolk) (Con)
Dr Alan Whitehead (Southampton, Test) (Lab)
Christian Matheson (City of Chester) (Lab)
Low-Carbon Industries
Peter Aldous (Waveney) (Con)
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John Lamont (Berwick, Roxburgh and Selkirk) (Con)
Net Zero Strategy
Matthew Pennycook (Greenwich and Woolwich) (Lab)
Green Homes Grant
Andrew Rosindell (Romford) (Con)
Small Modular Reactors
Bob Blackman (Harrow East) (Con)
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Caroline Ansell (Eastbourne) (Con)
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PARLIAMENTARY RECORD

LEGISLATION 1st September 2020 – 17th December 2020

Clean Air (Human Rights) Bill

A Bill to establish the right to breathe clean air; to require the Secretary of State to achieve and maintain clean air in England and Wales. A Private Members' Bill (Starting in the House of Lords) sponsored by Baroness Jones of Moulsecoomb. First reading was on 13 January 2020, second reading is yet to be scheduled.

Climate and Ecology Bill

A Bill to require the Prime Minister to achieve climate and ecology objectives; to give the Secretary of State a duty to create and implement a strategy to achieve those objectives; to establish a Citizens' Assembly to work with the Secretary of State in creating that strategy; to give duties to the Committee on Climate Change regarding the objectives and strategy; and for connected purposes. This is a Private Members' Bill and was presented to Parliament on 2nd September 2020 by Caroline Lucas MP. The next stage for this Bill, Second reading, is scheduled to take place on 12th March 2021.

Decarbonisation of Road Transport (Audit) Bill 2019-21

A Bill to make provision for independent audits of the costs and benefits of the decarbonisation of road transport, and of the regulation of the sale and production of petrol, diesel and hybrid cars. This is a Private Members' Bill and was presented to Parliament on 10th February 2020 by Sir Christopher Chope MP. The next stage for this Bill, Second reading, is scheduled to take place on 29th January 2021.

Decarbonisation and Economic Strategy Bill 2019-21

A Bill to place duties on the Secretary of State to decarbonise the United Kingdom economy and to reverse inequality; and for connected purposes. This is a Private Members' Bill and was presented to Parliament on 7th July 2020 by Caroline Lucas MP. The next stage for this Bill, Second reading, is scheduled to take place on 5th March 2021.

Domestic Energy (Value Added Tax) Bill

A Bill to reduce Value Added Tax on domestic energy bills; and for connected purposes. This is a Private Members' Bill and was presented to Parliament on 10th February 2020 by Sir Christopher Chope MP. The next stage for this Bill, Second reading, is scheduled to take place on 10th February 2021.

Domestic Premises (Energy Performance) Bill

A Bill to require the Secretary of State to ensure that domestic properties have a minimum energy performance rating of C on an Energy Performance Certificate; to make provision regarding performance and insulation

of new heating systems in existing properties; and for connected purposes.

Originally presented by Sir David Amess in the previous Parliament, this was presented in the House of Lords by Lord Foster of Bath. 2nd reading took place on 7th February. Committee stage, line by line examination of the Bill is yet to be scheduled.

Environment Bill (2019-21)

A Bill to make provision about targets, plans and policies for improving the natural environment; for statements and reports about environmental protection; for the Office for Environmental Protection; about waste and resource efficiency; about air quality; for the recall of products that fail to meet environmental standards; about water; about nature and biodiversity; for conservation covenants; about the regulation of chemicals; and for connected purposes.

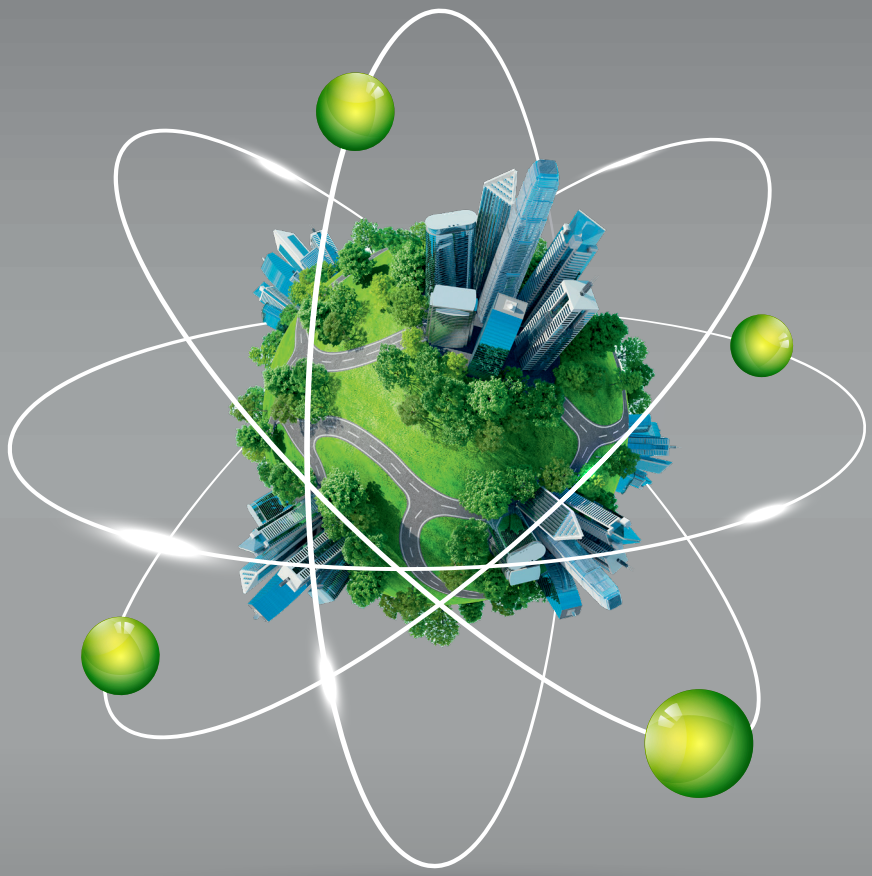
This is a Government Bill, introduced by Sir George Eustace, Department for Environment and Rural Affairs. The Bill was being considered by a Public Bill Committee, has now completed its work and has reported the Bill with amendments to the House, and is no longer able to receive written evidence. The Bill is now due to have its report stage and third reading on a date to be announced.

Local Electricity Bill 2019-21

A Bill to make provision for an independent audit of the costs and benefits of meeting the requirement under A Bill to enable electricity generators to become local electricity suppliers; and for connected purposes. This is a Private Members' Bill and was presented to Parliament on 10th June 2020 by Peter Aldous MP. Second reading is scheduled to take place on 5th February 2021.

Net Zero Carbon Emissions (Audit) Bill 2019-21

A Bill to make provision for an independent audit of the costs and benefits of meeting the requirement under the Climate Change Act 2008 for net United Kingdom carbon emissions to be zero by 2050; and for connected purposes. This is a Private Members' Bill and was presented to Parliament by Sir Christopher Chope on 10th February 2020. The Second reading is scheduled to take place on 5th March 2021.



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