Pathways to 2050:
Timelines for Business and Industry

Event Summary

On 17 June 2021, Policy Connect through its low-carbon energy forum Carbon Connect held a stakeholder roundtable, exploring timelines for UK businesses and industry to reach net zero by 2050. The discussion was framed by The International Energy Agency's (IEA) recent report ''Net Zero by 2050: A roadmap for the global energy system'', which sets out global pathways to 2050 with ambitious timelines and targets. A multitude of expert stakeholders discussed how net zero timelines can be achieved and what is required from government.

The event was chaired by Lord Teverson, with introductory remarks from Christophe McGlade (IEA), David Joffe (CCC), Maxine Frerk (Grid Edge Policy) and Stephen Barker (Siemens). This document was produced as a post-event write-up by Policy Connect. While it was informed by the roundtable discussion, it does not necessarily represent the views of all those in attendance or Policy Connect.

Key themes and topics:

- **Timelines and targets:** frontload action over the next decade, particularly energy efficiency measures
- **Innovation:** new technologies require government-backed investment for development at scale
- **Infrastructure:** electrification will require strengthening and smart use of the existing grid
- **CCUS:** an essential element of the UK's pathway to net zero, as is removing counterintuitive price signals
- **Construction standards:** developing and enforcing low-carbon standards is an urgent policy priority

Timelines and targets

As the IEA's report suggests, the pathway to net zero by 2050 is narrow but achievable; it calls for nothing short of a complete transformation of energy use within society. Globally, current commitments fall short of what is required, as targets are often not underpinned by near term policy.

Immediate term action in the 2020s will be crucial, which is the decade for deploying technologies for renewable energy and determining solutions in remaining areas of uncertainty. In this way, renewables must become the dominant fuel for electricity, and subsequently, there is no need for new oil or natural gas fields. Indeed, net zero for the electricity grid may be achievable by 2025.

Because cumulative emissions are key, timelines must provide a sense of urgency with near, medium, and long-term targets. Focus must be given to action that can be taken immediately, such as deploying readily-available renewable technology and promoting energy efficiency. Emissions reductions are frontloaded in both the CCC and IEA's pathways, with the potential of energy efficiency exhausted by 2030 in the latter and

a 63% reduction of total emissions by 2030 in the former. In addition, remaining uncertainty surrounding the role of hydrogen, biogas, and carbon capture, usage and storage (CCUS) must be resolved. Decisions must be made today to allow for the long lead in times of business and industry, when replacing facilities, equipment, and altering supply chains.

However, presenting pathways that rely heavily upon CCUS, negative emissions and new technologies may discourage politicians from taking immediate, direct action to cut emissions, causing a delay within central decision making. Therefore, emphasis should remain upon tackling more challenging elements of decarbonisation and creating pathways that succeed via emissions reduction, not just mitigation.

Technological innovation

Within the IEA's pathway, by 2050 50% of emission reductions will result from technologies currently in prototype or demonstration. Participants discussed the risks of building reliance upon technologies not yet available into the pathway. In addition to involving a degree of uncertainty, new technologies will require significant incentives; such technology is often high investment with long term paybacks for businesses, and therefore is unlikely to be integrated at scale without encouragement from central government.

However, within the IEA's pathway, there will still be a 40% reduction in emissions by 2030 if exclusively established technologies are used. Maximising the reductive potential of these technologies affords a short buffer period to further develop innovative technologies, which can then contribute to emissions reductions after 2030. Furthermore, much of this technology is already in prototype. For example, ammonia has been suggested as a low-carbon bunker fuel for shipping; this has not been deployed at scale, but there is currently one ship operating on ammonia. There is potential for such technologies to be scaled up in the medium term, but government-backed investment and infrastructure provision is crucial for this next step.

Infrastructure

Electricity must replace oil, gas and coal as the major power supply for businesses and industry. Mass electrification will significantly increase demand on the existing electricity grid, entailing a strengthening of this infrastructure. Increasingly, regulators are considering investment in the grid ahead of the demand itself, as direction of travel becomes more apparent. Significant planning is being undertaken to manage new technologies coming on to the grid, and flexible services will form a large part of the solution. Before significant upgrades are made to the grid, focus should be on operating the grid smartly and working with patterns of energy demand. Nonetheless, government-backed investment and upskilling will be required to make this rapid transition. In the immediate term, no new fossil fuel electricity plants should be built, as these will quickly become redundant.

CCUS

Participants commented that deploying CCUS technology demonstrates a serious commitment to reducing emissions and meeting the Paris Agreement. In the UK, its current lack of widespread presence is indicative of a lack of ambition. However, separating the infrastructure from particular projects is a positive step. In the IEA's pathway, CCUS is not intended exclusively for the power sector where it can lock in fossil fuels, but

rather for countries with very young fossil fuels industries, where alternative options would create massive job losses and strand assets. Globally, this technology will become necessary in sectors which are particularly challenging to decarbonise, such as shipping and aviation. For UK businesses and industry, offsetting via CCUS will be part of the mix of reaching net zero.

Like other decarbonising technologies, CCUS is costly and represents an investment for long term gain. Its lack of presence in the UK reflects a market in which low-carbon technology is not incentivised. Carbon pricing in every sector that increases predictably would make this technology affordable and allow businesses to plan. This approach has been effective in the Canadian oil industry, which has increased CCUS capacity because carbon pricing has made it worthwhile. This requires commitment from government, which has been lacking in the comparable tax on road fuel which it is reticent to increase.

It was also suggested that if a carbon tax is the answer, you are asking the wrong question: carbon neutrality is the most economically efficient approach to reducing emissions. Nonetheless, priorities in political decision-making could render CCUS a more realistic option, and make deploying new technologies more feasible. More broadly, whilst carbon pricing is not a silver bullet solution, discouraging price signals that encourage fuels and technologies with high emissions would be a better first step. For example, there are currently no incentives for negative carbon results within businesses and industry. If these were implemented, businesses would be more likely to develop innovative low-carbon solutions that operate most effectively for them. For example, Siemens have introduced an internal carbon price, which invests back into the business as seed funding for low-carbon measures.

Construction standards

Developing and enforcing low-carbon construction standards must be a priority for government and the building industry. This has potential to deliver significant reductions in emissions resulting from home heating and power, in addition to improved comfort levels amid changes to the UK's climate. Despite a comparably clear pathway in this sector, there has been a consistent lack of policy action. Consistent leadership, beyond short term policies such as the Green Homes Grant, is required from government. Increasingly, the UK's housing stock will need to adapt to a changing climate with high-quality ventilation and design.

To achieve this, EPCs must be made more comprehensive and consistent, allowing homebuilders to be held accountable for standards. Government must also enforce new low-carbon construction standards among major builders, which will require significant investment and engagement. Standards and targets should be set at 2030 and 2050, to ensure sufficient progress is made by the latter date. If these steps are taken, low-carbon home building has potential to deliver significant emissions reductions on the road to net zero.

Roundtable participants

Bosch
Citizens Climate Lobby UK
Climate Change Committee (CCC)
DASH Rides
DNV GL
GAMBICA
Genuit Group
Grid Edge Policy
Grundon Waste Management
House of Lords
International Energy Agency (IEA)
Made In Group
National Grid ESO
Providence Policy
Siemens
UKERC
Uniper

About Carbon Connect

Carbon Connect is the independent, cross-party forum that seeks to inform and guide a low carbon transformation underpinned by sustainable energy. Carbon Connect's main activities comprise facilitating discussion between industry, academia and policymakers on low carbon energy and producing its own research and briefings in this area.

In 2009 the Rt Hon Ed Miliband MP, then Secretary of State for Energy and Climate Change, delivered a keynote address at the Westminster launch of Carbon Connect. Since then Carbon Connect has been at the forefront of policy debate, parliamentary engagement and research related to sustainable energy.

Over a number of years, Carbon Connect has built up an unrivalled portfolio of parliamentary roundtables and conferences, detailed policy briefings and highly respected reports. This has been achieved by drawing on the expertise of Carbon Connect members and working with a wide range of parliamentarians, civil servants, business leaders and experts who give their time and expertise to support our work.

For our member organisations we provide a varied programme of meetings in Parliament and policy research. Together, we discuss and analyse the opportunities and challenges presented by a low carbon transformation underpinned by sustainable energy.

About Policy Connect

Policy Connect was set up by a cross-party group of MPs around Barry Sheerman MP who continues to be the organisation's chair. Policy Connect membership-based, not-for-profit, cross-party think tank. We bring together parliamentarians and government in collaboration with academia, business and civil society to inform, influence and improve UK public policy through debate, research and innovative thinking.

We lead and manage an extensive network of parliamentary groups, research commissions, forums and campaigns. We are a London living wage and Disability Confident employer and a Member of Social Enterprise UK, and have been operating since 1995. Our work focuses on key policy areas including: health; education & skills; industry, technology & innovation; and sustainability. We shape policy in Westminster through meetings, events, research and impact work.

Our mission is to lead the development of new policy ideas through evidence and collaboration.