

Industrial decarbonisation in the UK: The scene is set

May 2021



With local and devolved elections across the UK concluded on 6 May 2021, we can expect the conveyor belt of publications from the UK Government on Net Zero to whirl into action again with COP26 just six months away. Indeed, five publications from the Department for Business, Energy and Industrial Strategy (BEIS) on carbon capture, use and storage (CCUS) were the first out of the gate the very next day. One of the material publications by Government during Q1 of 2021 was the Industrial Decarbonisation Strategy (the IDS)¹. It set out Government's view on what transformation in industry is required to meet Net Zero without driving businesses and their related carbon emissions overseas (so called "carbon leakage"). In anticipation of long awaited materials from UK policymakers such as the Hydrogen Strategy, Net Zero Strategy and Zero Heat & Buildings Strategy, this note looks at key themes from the IDS and subsequent publications, the latest developments in the deployment of CCUS envisaged under them and what to look out for in upcoming publications.

Speed read

- The UK Government has articulated "expectations" that industrial emissions will need to reduce by two thirds by 2035 and 90% by 2050 (from 2018 levels) to achieve the ambition of Net Zero.
- Industrial sectors in the UK must decarbonise on an accelerated basis for the UK to have any chance of meeting these requiring a Green Industrial Revolution that coincides with the wider political will to "build back greener" from the effects of the COVID-19 pandemic."
- The UK is taking a cluster led approach to industrial decarbonisation, focussing early effort on developing four decarbonised clusters in the UK's key industrial centres.
- Government efforts in the 2020s will centre on encouraging the deployment of CCUS and fuel switching to hydrogen. An aggressive timetable for the allocation of funding to cluster developments for CCUS has been announced and business models to support investment are being further progressed.
- Industrial sites not within a cluster will be encouraged to invest in energy efficiency, reuse and management and being ready for CCUS or hydrogen retrofit.
- Carrots and sticks to encourage industrial decarbonisation will need to be balanced with ensuring affordability affordability for industry, the consumer and/or taxpayer and avoiding the migration of businesses and their emissions overseas.

¹https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/970229/Industrial_Decarbonisation_Strategy_March_2021.pdf

19% of 2018 UK territorial emissions was from industry

Why is there an IDS?

19% of UK emissions from industry

The UK Energy White Paper² attributed 19% of 2018 UK territorial emissions to industry, roughly equivalent to those derived from buildings, and greater than those emitted by power generation³. Decarbonisation of industrial and manufacturing processes across all sectors will therefore be a significant factor in the UK achieving its Net Zero ambitions. The IDS is intended to be the indicative roadmap for how this may be achieved. Its length, complexity and,

in places, vague content, is evidence that decarbonisation of the “how we make things”⁴ is going to be extremely challenging, requiring a transformation that is unprecedented in terms of scale, pace and cost, with impacts far beyond energy policy: A Green Industrial Revolution. But such revolution is also an enormous opportunity for industry and investors to participate in the growth “green” sectors that will emerge as a result.

IDS principles

Targeted intervention to support market-led solutions: Decisions made or questions still to be answered?

The IDS states that Government action will be driven by the following principles:

- Markets will be best placed to determine the most cost-effective pathways to decarbonisation, and so intervention should be focussed on addressing market failures or barriers to decarbonisation and be technology neutral.
- Costs of intervention should be shared fairly between industry, consumers and taxpayers.
- There should be targeted intervention to mitigate the risk of carbon leakage as a result of decarbonisation costs imposed in the UK.
- Government should play a key role in the delivery of large infrastructure projects for key technologies such as CCUS and hydrogen, where there is a shared benefit and the risk or cost is too great for the private sector.
- Government should intervene to deliver specific strategic outcomes aligned to priorities for social and economic “levelling up” of UK regions and post COVID-19 recovery.

These principles pervade the designated actions specified in the IDS and can be expected to guide the contents of future publications and policy. Some of the principles arguably undersell the degree of intervention that Government is willing to make when you consider some of the support regimes being proposed for CCUS and hydrogen. A number of the principles also highlight that there remain fundamental policy choices to be made by Government, not least on who will ultimately pick up the tab for industrial decarbonisation: product consumers, industry or taxpayers. In December 2020, Government indicated that the counterparty to industrial carbon capture contracts (**ICC Contracts**) was anticipated to be the Low Carbon Contracts Company (**LCCC**). However, as LCCC is currently funded by a levy on electricity suppliers and thus paid for by electricity consumers, it is not entirely clear that this counterparty makes sense without significant legislative and administrative changes to the set-up of LCCC.

The latest CCUS updates include one reference to ICC Contracts being funded from the exchequer, but there is no further elaboration. Ultimately, the bill for all aspects of energy transition will land on the public in some way (whether through the price of goods, services or utilities, tax, pension growth or otherwise) and affordability of the aggregate bill will be a hot topic for years to come. Further information on the revenue mechanism to fund the industrial carbon capture business model is to be provided later in 2021.

² https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/945899/201216_BEIS_EWP_Command_Paper_Accessible.pdf

³ Alternative figures quoted in the Energy White Paper and IDS put industrial emissions at 16% of total UK emissions, due to different definitions of industry being used.

⁴ B. Gates “How to avoid climate disaster: The solutions we have and the breakthroughs we need,” Allen Lane, 2021.

So, what is the plan?

2030 is the new 2050

In order to align with the nationally determined contribution under the Paris Agreement and presumably now also the more recent pledge in the UK's 6th Carbon Budget to reduce UK emissions by 78% by 2035⁵, the IDS establishes a number of headline "expectations" (not "targets").

These expectations are to be revisited in the Net Zero Strategy later this year and over time as costs evolve.

In simple terms, the overall strategy for the 2020s is two-fold: Firstly, the UK will set up the policy and infrastructure foundations for technologies that we already know will be required for deep decarbonisation of heavy industry in the longer term so as to keep options open for future fuel mix. In the meantime, the UK will ensure that business does not lock in high carbon technologies and instead implements technologies that are available now to maximise energy and resource efficiency. The logic is that this will help reduce the level of emissions needing to be abated through expensive deep decarbonisation measures, and thus the total cost of decarbonisation will be lower. Alongside this, steps will be put in place to give appropriate market signals to change behaviours of key players.

For industry itself, this will include measures to encourage fuel switching (away from gas and coal to electrification, hydrogen or bioenergy).

For end-use consumers of industrial products, this will comprise a number of "demand side policies" aimed at creating a market for green products that can absorb at least some of the increased costs of production: the so called "green premiums".

Beyond the 2020s, the detail of the plan is somewhat vague and will heavily depend on the outcomes of the preceding decade, particularly in relation to carbon and fuel networks and electrification.

⁵ <https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035>. The IDS pre-dated this announcement.

IDS Expectations to achieve Net Zero

- A two thirds reduction in emissions by 2030, and a 90% reduction by 2050 (when compared to 2018 levels).
- 3MtCO₂ captured through CCUS technology by 2030.
- 20TWh switching to low carbon fuels (ie hydrogen, electricity or bioenergy) by 2035.
- Two carbon capture clusters by 2025, four low carbon industrial clusters by 2030 and 1 Net Zero industrial cluster by 2040.
- Consideration of a target for ore-based steelmaking to reach near zero emissions by 2035.





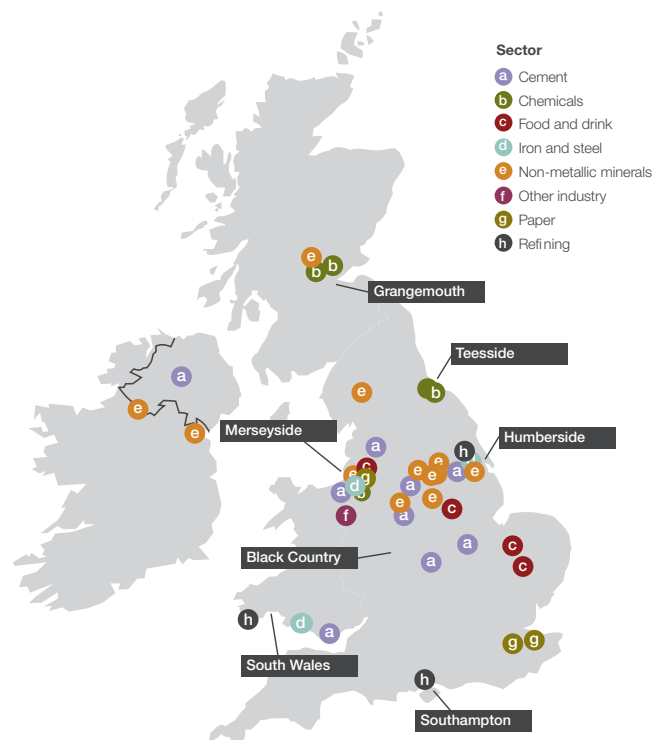
Clusters and networks

Better “bang for your buck” by sharing infrastructure and learning in industry intensive areas first

As set out in the IDS, the six largest industrial clusters in the UK (Humberside, South Wales, Merseyside, Grangemouth, Southampton and Teesside) presently account for 50% of UK industrial CO₂ emissions and offer the largest potential benefits in utilising shared decarbonisation infrastructure to minimise the cost of transition, seeking to emulate the cost reductions seen for other technologies such as offshore wind. For example, decarbonising two blast furnace sites in the South Wales and Humberside clusters alone would remove 15% of total UK industrial emissions. It is for these reasons that the IDS focusses immediate attention and much of the support for CCUS deployment and low carbon hydrogen infrastructure on those clusters.

Policy decisions about wider infrastructure networks for CCUS and low carbon hydrogen beyond the clusters will shape the route to Net Zero, including whether the dominant low carbon fuel of the future is clean hydrogen, electricity or otherwise. Government will need to see progress on all fronts to enable future choices for industry, as shown through the National Network or Cluster Network scenarios described in the IDS. Particularly from the mid-2030s, levels of hydrogen consumption will depend greatly on the extent of national hydrogen networks in addition to those in industrial clusters. The IDS notes how Government’s Hydrogen Grid R&D programme is supporting projects to determine the desirability of fully converting the natural gas grid to hydrogen. This is in addition to exploring the safety case for blending hydrogen into the gas grid for end-users, including industrial consumers. Government aims for a policy decision by the mid-2020s on the future of hydrogen for heating and linkages with the natural gas grid.

This decision will be heavily influenced by the “heat pump or hydrogen” debate in the context of domestic heating, demonstrating the interdependencies between domestic and non-domestic energy policy in the UK. The IDS notes that the role for CCUS beyond the clusters is less clear, unless there is a substantial reduction in technology costs and developed carbon transportation infrastructure, particularly non-piped arrangements.



Source: IDS A map of industrial sites across the UK with emissions greater than 0.1MtCO₂e and key industrial clusters of sites of any size.

Dispersed sites

The harder problem to solve, but doing nothing is not an option

In the meantime, for dispersed sites outside of the clusters, the 2020s will be largely focused on investments in energy efficiency and reuse and electrification through other “low regret” choices. The IDS acknowledges that deep decarbonisation of dispersed sites may only occur from the 2030s onwards but those sites need to get prepared. Long lifecycles of large industrial equipment means opportunities for major overhaul in the next 30 years are limited and Government is keen to avoid missing the window for decarbonisation because equipment needs replacing before necessary infrastructure or policy is in place. Industry should therefore be prepared for the imposition of requirements for upgraded equipment installed

during the 2020s to be “low carbon ready” for retrofit of either CCUS or hydrogen. The IDS does not yet have answers for the potential for deep decarbonisation at problematic dispersed sites, such as cement manufacturing sites with high process-emissions that cannot be displaced by use of hydrogen but which are too remote from CCUS infrastructure. Government is trying to ensure that the business model proposed to support the transport and storage elements of the CCUS value chain can accommodate potential non-piped transportation from dispersed sites. However, they are trying to balance this with maintaining simplicity for early stage projects in particular. There is a risk that these dispersed sites are unable to reach a Net Zero compliant end state by 2050, and it will be interesting to see how Government’s thinking on these sites in particular develops over the decade.

CCUS and hydrogen

Substantial Government support will be available

Whilst an IDS principle is technology neutrality, the IDS expressly acknowledges that CCUS and low carbon hydrogen will be the hallmarks of Net Zero transition. However, Government also recognises that it will need to play an active role in overcoming market failures and share the risk and costs of scaling up deployment of these technologies. The IDS therefore includes a number of actions focussed on funding mechanisms to support the deployment and use of CCUS and low carbon hydrogen infrastructure.

Throughout the early 2020s, Government will support the engineering and technical design elements of decarbonisation projects across the UK’s industrial clusters through UK

Research and Innovation’s Industrial Decarbonisation Challenge (**IDC**). Under the IDC, GBP171m of funding has been awarded across nine projects including three offshore CO₂ storage sites and a number of high profile CO₂ capture and hydrogen production projects⁶. The level of work required for a final submission to the CCUS cluster sequencing process by early July 2021 is an example of the material development cost risk taken by cluster consortiums on projects that generally have long development periods. The allocation of IDC funding (alongside other measures such as the early works support for carbon transport and storage) will therefore be invaluable and there may well be increased appetite for development funding from wider sources.

Recipients of funding under the Industrial Decarbonisation Challenge

- Cadent and other organisations involved have been awarded almost GBP33m in funding for onshore and offshore aspects of the HyNet project aimed at capturing and storing carbon emissions from the operations of a low carbon industrial cluster and developing the North West hydrogen economy.
- Net Zero Teeside is to receive over GBP28m to help develop a project to capture 2MtCO₂ per annum from a flexible gas power plant which will be stored under the Southern North Sea by Northern Endurance Partnership.
- The Northern Endurance Partnership is to receive over GBP24m to assist in creating an offshore CO₂ transport and storage system connecting Net Zero Teeside and Zero Carbon Humber projects into one initial geological store.
- Zero Carbon Humber is to receive over GBP21m to transform the Humber region into a net zero cluster by 2040. Plans include H2H Saltend, an at-scale low carbon hydrogen production plant and pipelines transporting CO₂ and hydrogen.
- Humber Zero is to receive over GBP12m to develop a CCUS retrofit project at an industrial complex in Immingham.
- The South Wales Industrial Cluster is to receive nearly GBP20m to create a decarbonised industrial zone deploying hydrogen and the development of CCUS.
- As part of the Scottish Net Zero Infrastructure programme, Pale Blue Dot Energy and others are to receive over GBP30m to develop a CCUS and hydrogen hub in Scotland using existing gas pipelines and sub-surface rock formations under the North Sea.

⁶<https://www.ukri.org/news/ukri-awards-171m-in-uk-decarbonisation-to-nine-projects/>

Cluster sequencing

Track 1 selection by October 2021 to access carbon CfD or economic licence

On CCUS specifically, the IDS refers to the substantial work already done by Government on developing an industrial carbon capture contract for difference and a CO₂ transport and storage regulated investment business model.

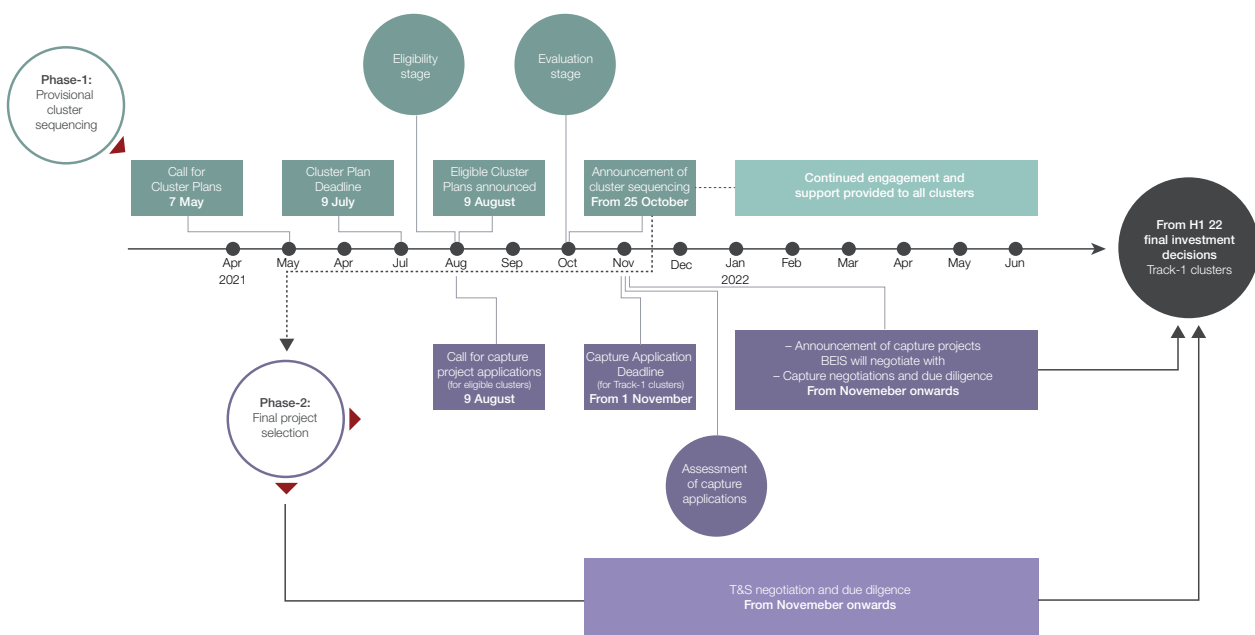
Under the ICC contract proposals, an industrial emitter will be paid an amount per tonne of captured CO₂ to cover operational expenses (including CO₂ transport and storage fees) and repayment of, and return on, capital investment in carbon capture equipment, calculated by reference to the carbon price. In respect of CO₂ transport and storage, the Government proposes the establishment of a new private sector regulatory investment model that will grant “T&SCo” an economic licence similar to regimes seen for other sectors in the UK such as electricity, gas, water, telecoms and transport.

On 7th May 2021, BEIS published further updates to these business models⁷, as well as setting out the cluster sequencing process by which Government will select the initial clusters and carbon capture projects that may be allocated support⁸. The timetable is ambitious. By the end of October 2021 Government will select two CCUS Clusters that are most suited to deployment in the mid-2020s and sequence them onto “Track 1”.

A “CCUS Cluster” must comprise a T&S Network⁹ (that will act as the cluster lead for the sequencing process) and at least two CO₂ capture projects. It must also be located in the UK and credibly demonstrate that it can be operational by 2030. The T&S Network within a Track 1 CCUS Cluster will not go through any further competitive process to obtain Government support, however further due diligence, permitting activity and agreement of the level of financing support would be needed.

Maintaining competitive tension, the allocation of a CCUS Cluster to Track 1 is no guarantee that support will be provided and Government expects to name reserve clusters should it choose to discontinue engagement with a Track 1 CCUS Cluster or there is room in the affordability envelope to add another cluster to Track 1.

By contrast, the specific CO₂ capture projects that are part of a Track 1 CCUS Cluster must go through a further competitive process. In Phase 2 of the cluster sequencing process, Government will make specific awards of funding to individual capture projects within, or that could feasibly connect to, the Track 1 CCUS Clusters, regardless of whether those capture projects featured on the initial CCUS Cluster submission. There are clearly potential challenges for capture projects as a result of the uncertainty of further open competition, especially since a capture project is only able to appear on one cluster submission. However, on balance, Government has preferred an approach that avoids too much influence being left with cluster leads and has offered reassurance to capture projects that are fully integrated with the T&S Network in a Track 1 CCUS Cluster. Eligibility criteria have been provided for each capture application, but all must be located in the UK, be capable of completing pre-FEED activities by the end of 2022 and be capable of being operational by December 2027¹⁰. All capture projects must also have access to a carbon transport solution and storage site, although this does not have to be a store in the UK and so there is some room for non-integrated carbon capture projects to obtain support which may be of interest to dispersed industrial and power generation sites.



Source: BEIS, Cluster Sequencing for Carbon Capture Use and Storage Deployment: Phase 1 guidance.

7 <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models>

8 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/986007/ccus-cluster-sequencing-phase-1-guidance-for-submissions.pdf

9 Defined in the guidance as a set of onshore pipelines, offshore pipelines and an associated offshore storage facility. For early operational projects, Government has indicated that an integrated transport and storage structure is most appropriate rather than looking to actively facilitate unbundling the two components, or separating onshore and offshore aspects.

10 The discrepancy between the deadline of 2030 for a cluster and 2027 for a capture project is explained as allowing a cluster to include in its cluster plan capture projects that may be operational later for the purposes of the Phase 1 assessment but those capture projects may not participate at Phase 2.

CCUS – carbon capture in an industrial context

Industrial capture CfD only available to eligible facilities

An ICC Contract will only be available to projects that meet the definition of an “industrial facility” in one or more “eligible sectors”. These definitions are fairly wide, but importantly exclude new build CCUS enabled “blue” hydrogen production facilities (which are to be supported via the low carbon hydrogen support mechanisms instead) and upstream oil and gas field operations.

Further work is to be done by Government on the application of the ICC Contract to efficient energy from waste and combined heat and power facilities, commonly located on or adjacent to industrial sites, where the majority of the heat and/or power output is used for industrial purposes.

Government has recognised that such facilities may not be owned by the same entity as owns the industrial process it serves (for example, where industrial customers have utilised “energy as a service” or similar models under which energy generation equipment is owned and operated by third party operators and the heat provided to the industrial customer through a private heat network and/or power provided via a private wire or onsite supply arrangement). Government is considering how to facilitate a similar kind of delivery model for carbon capture, whereby smaller and/or dispersed industrial sites could engage another provider to capture its emissions as a service. The driver for such a “Capture as a Service” (CaaS) model appears to be greater value for money offered by smaller sites being able to utilise common capture plant.

However, such a model could also allow industrial emitters to outsource the complexity and risks presented by a carbon capture project that is not their forté and/or obtain long term financing for capture plant at its site. Further details on the CaaS model will be provided later in 2021.

Other sources of support

Government has clarified that the support available to industrial carbon capture and T&S projects through the applicable business models may also be supplemented by access to funding under the GBP1 billion CCS Infrastructure Fund (CIF) to address specific risks and issues identified in the business models. The CIF may be used to fill the “revenue gap” for T&S Networks caused by underutilisation of the network capacity in early years, and to co-fund a portion of capital costs on early industrial carbon capture projects so as to reflect the higher capital costs and risk premiums attached to first of a kind projects. The CIF will not be available to power or CCUS enabled “blue” hydrogen projects.

The Government has also suggested a potential role for the UK Infrastructure Bank (UKIB) where a CCUS project meets the bank’s investment criteria and objectives. UKIB’s mandate to co-invest with the private sector to enable and accelerate delivery of projects consistent with the Government’s wider climate and economic agenda raises the prospect of even further private investment in CCUS projects.

Hydrogen – still a waiting game

Revenue mechanism still awaited - will need to consider both supply and demand sides

For hydrogen, the GBP240m Net Zero Hydrogen Fund (NZHF) will provide capital co-investment for early low carbon hydrogen production projects (including new build CCUS-enabled (blue) and electrolytic (green) hydrogen production).

Otherwise, the IDS signposts again the eagerly awaited revenue mechanism to support business models for low carbon hydrogen, confirming Government’s commitment to a consultation on preferred low-carbon hydrogen business models in Q2 2021 (with a final model to be agreed in 2022) and further details on the revenue mechanism to fund the hydrogen business model later in 2021.

The latest publications on CCUS did not provide much by way of an interim update on the hydrogen business model, other than to indicate that Government considers a producer side subsidy combined with demand side incentives would be the most efficient way to stimulate hydrogen production and provide reasonable surety of returns for investors.

Unsurprisingly the producer side subsidy is likely to be a contractual framework providing revenue support over a contract term, incorporating a proportion of operational costs and an appropriate rate of return on capital invested. For demand side incentives, further work is being done to explore the adaptations to policies and regulations required and additional mechanisms to support different end users of hydrogen.

For new build CCUS-enabled “blue” hydrogen plants, access to the hydrogen business model support will be via the cluster sequencing process described above. The Phase 2 eligibility criteria for such applications will include a requirement to have identified, and entered into a memorandum of understanding with, offtakers for their hydrogen, again indicating a significant level of maturity and co-ordination required from early projects within the next two months. However, Government does sound a warning that, whilst not ineligible, projects hoping to rely on offtake arrangements utilising the existing gas network will need to bear in mind that a decision on whether to blend hydrogen into the existing network is not expected until Q4 2023 at the earliest. For hydrogen projects that do not involve CCUS, including for other production types like electrolytic hydrogen, eligibility criteria for accessing government support are to be considered in due course.



Other “low regret” actions

Encouraging investment in other decarbonisation solutions

Whilst a lot of attention in the IDS is put on the role of big ticket technology such as CCUS and hydrogen, energy and resource efficiency will play a particularly significant role in reducing industrial emissions in the 2020s whilst the infrastructure for deep decarbonisation is built up. Furthermore, the IDS highlights the potential for electrification of industry to reduce emissions by between 5 MtCO₂e and 12.3 MtCO₂e per annum by 2050, and the ability to improve heat recovery and reuse, especially at high temperature sites. Many low temperature electrification technologies such as heat pumps are already commercially available and there are a growing number of projects in the private and public sector aimed at capturing waste heat from manufacturing processes, chemical treatment processes, transport and data centres. Smart technologies, such as battery storage and demand-side response, can also provide flexibility to the electricity system, helping industrial consumers use energy when it is cheapest and cleanest and potentially generate additional revenues.

Significant barriers to overcome

However, whilst further funding schemes such as the Industrial Energy Transformation Fund and measures such as the investment super-deduction announced in the 2021 Budget¹¹ offer some support to business wishing to invest in efficiency and decarbonisation already, there remain significant barriers to overcome. In our experience, these barriers include a lack of awareness; a lack of expertise and advice within the industrial sector to scope and structure the appropriate energy measures for the specific technical and commercial needs of the relevant business; lack of access to finance; fierce internal competition for required investment

capital; and long pay-back periods given the current upfront cost of such technologies being disproportionate to the cost savings that would result.

Initial proposals on a range of wider topics but more details needed

The IDS includes proposals on a range of topics: audit programmes; efficiency standards; encouraging the installation of energy management systems and the holding of energy management accreditations; the provision of expert advice and training for SMEs; and expanded funding schemes, finance options and support for capital and operational costs. Energy performance contracting, “energy as a service” and other forms of asset finance based business models for implementing energy generation and conservation measures are available in the market. However, the IDS does not give any detail on steps it may take to facilitate or encourage businesses to access them, or what other funding schemes or finance options there may be. No mention is made of any plan for new non-domestic subsidies (similar to the non-domestic renewable heat incentive¹²) that would subsidise some energy solutions to help make them economically viable. There is also no mention of distributed renewable electricity generation from sources like solar PV or wind located on industrial sites. This may suggest that Government does not see distributed power generation as a material contributor to industrial decarbonisation, or that Government wishes to keep measures to decarbonise electricity production separate to industrial decarbonisation. Alternatively, it may be a sign that Government does not consider there to be a market failure in those technologies given the relatively competitive UK solar development market for small to medium projects and Government support for solar and wind in CfD Allocation Round 4 is limited to projects larger than 5MW.

¹¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/967202/Super_deduction_factsheet.pdf

¹² The Non-Domestic Renewable Heat Incentive provided subsidies to business who installed renewable heating systems but generally closed to new applicants in March 2021.

See <https://www.ofgem.gov.uk/environmental-programmes/non-domestic-rhi/about-non-domestic-rhi>

Innovation funding and collaboration

How do we get to know what we don't yet know?

Innovation is a key theme of the IDS, with the express acknowledgement that much of the technology needed to bring about a Green Industrial Revolution at low cost is at an early stage of development and progress needs to be accelerated. Short term innovation priorities have been set as fuel switching (to low carbon electricity, hydrogen and biomass); industrial CCUS; energy efficiency and digitisation, advanced technologies and product innovation. A maze of public funding pots are available to support efforts in these areas including the Net Zero Innovation Portfolio¹³, the Industrial Strategy Challenge Fund¹⁴ and the Industrial Energy Transformation Fund¹⁵, and funding has already been made available through a number of schemes relevant to the industrial sector such as the Carbon Capture and Utilisation Demonstration Programme. The availability of this funding and the accelerated growth it may trigger will be of interest in particular to private equity and venture capital investors looking for additions to their increasingly sustainability focused portfolios.

A place on the world stage

Often with innovation comes collaboration and the IDS sets ambitions for the UK to lead strong international co-operation to develop new technology faster and bring down emissions and costs more quickly. Of course, this is also driven by a degree of economic self-interest. Government has a vision of the UK becoming a global leader in industrial decarbonisation and the manufacture of low carbon products so that UK plc can capitalise on the export opportunities that Net Zero will bring. Given the UK's academic, technical, industrial and financial expertise in the clean energy sector already, there is clearly potential for the UK to become a hub for clean energy innovation and investment: It remains to be seen whether policy will enable this potential to be realised.

¹³ <https://www.gov.uk/government/collections/net-zero-innovation-portfolio>

¹⁴ <https://www.ukri.org/our-work/our-main-funds/industrial-strategy-challenge-fund/>. The IDCF is also part of the ISCF, along with competitions for low cost nuclear, smart local energy systems, transforming food production and transforming foundation industries.

¹⁵ <https://www.gov.uk/government/collections/industrial-energy-transformation-fund>



Market signals

Creating the right market conditions for new technologies to compete

Deploying CCUS or hydrogen infrastructure, or other “low regret” technologies will be futile if industry is still incentivised to use fossil fuels. The IDS therefore includes a number of designated actions aimed at seeking to drive certain behaviours of industry and their consumer base.

Carbon pricing – reflecting the environmental cost of business decisions

The IDS is very clear that Government sees carbon pricing as an effective tool for getting industry to take account of emissions in its investment decisions. More onerous obligations to pay carbon costs will therefore be used to send a market signal to industry and investors.

The UK Emissions Trading Scheme (**UK ETS**) will be reviewed to ensure the cap on carbon emissions is aligned to UK emissions targets and Government will consider the long-term role of free emissions allowances and extending the scheme to capture emissions from more sectors of the economy.

Low carbon hydrogen still to be defined

Government is also considering the role of fuel standards in facilitating investment and will work with industry to develop a UK standard that defines low carbon hydrogen (further details to be announced in the Hydrogen Strategy and Low Carbon Hydrogen Standards consultation).

The practical impact of ESG reporting and disclosure

Increased sustainability or “ESG” reporting and disclosure obligations for corporates and investors will also provide a broader incentive for industry to decarbonise their activities and supply chains. For more information on these topics please refer to the Sustainability Hub on the A&O website¹⁶.

Demand side policies – creating a market for green products

For end-consumers, the IDS plans that regulation will support the development of the market for low carbon products, including by the implementation of demand-side policies aimed at making low carbon products competitive and enabling industry and the end consumers of industrial products to share in the cost of decarbonisation.

What comes next?

The sheer amount of work to be done by Government, industry, developers, investors, financiers and consumers over the coming months and years to formulate, share, assess, implement and participate in the policy mechanisms on industrial decarbonisation is immense. The Hydrogen

The IDS identifies two key barriers to getting consumers to choose low carbon products: a lack of information and transparency to enable consumers to make an informed choice and price. Designated actions in the IDS therefore include a number of different measures, although they seem to primarily address the information barriers rather than price. Such actions include: improving data available on emissions associated with individual products (whilst being mindful of introducing another environmental reporting obligation); developing a definition of “low carbon industrial products”; introducing a voluntary (if not mandatory) product standards system for key industrial products by 2025; and expanding product labelling on consumer products to include embodied emissions and introducing a new product labelling system for intermediary industrial products by the mid-2020s. There are also commitments to using public sector buying power to also drive demand and drive down cost. Such steps may therefore have impacts on energy and infrastructure projects beyond the industrial sector. Whilst such steps would appear helpful in encouraging consumer behaviour, the extent to which compliance with these initiatives adds to the financial and compliance burden of industrial decarbonisation will remain to be seen.

Carbon and business leakage

Government is also acutely aware of the risk of that carbon intensive industry choose to relocate as a result of the impact of decarbonisation measures taken in the UK, taking their economic contribution (and emissions) with them. The IDS anticipates mitigating such risks by measures other than the current exemptions for energy intensive industry and free allowances under UK ETS, although both will remain the primary tools in the short term. What those other measures may be are less clear. The IDS refers to ambitions of improving UK productivity and “climate diplomacy”, which may be more powerful in the year of COP26 and demonstrates again an intent for the UK to be at the forefront of a global effort on climate change. Discriminatory treatment of imports is also proposed, and the introduction of carbon border adjustment mechanisms that impose additional charges on imports from countries with less stringent climate policy is something that has already been seen from the EU¹⁷.

Strategy, Net Zero Strategy and further detail on the business models to support CCUS and hydrogen roll out are particular highlights to come in the coming weeks and months, but there is far more that has been teased in the IDS trailer. The scene is indeed set for an action packed thriller.

¹⁶ <https://www.allenoverly.com/en-gb/global/news-and-insights/transition-to-a-sustainable-economy>

¹⁷ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12228-EU-Green-Deal-carbon-border-adjustment-mechanism-_en

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