

Energy Security and Net Zero Committee: Keeping the power on - our future energy technology mix

Centrica plc
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Executive Summary

While Centrica is best known as the owner of British Gas, our Group brings together capabilities which support the UK and Ireland's energy security and will help the country reach net zero. Centrica is a uniquely integrated energy company built around three pillars that each compliment and add value to others: (i) retail businesses serving over 10 million customers; (ii) material gas and power infrastructure assets; and (iii) market leading optimisation capability.

We are proud to offer skilled, well-paid jobs for our 20,000 strong team - and we're growing, taking on a new apprentice for every day of this decade. Our customers benefit from zero carbon electricity supplied from our interest in the UK nuclear fleet, long-term power purchase agreements with renewable electricity generators, and £70bn worth of long-term gas supply contracts. Indeed, Centrica's wider strategy and capabilities centre on enabling a low carbon future.

We have recently announced a green-focussed growth and investment plan with capital investment building to £600-800m per annum by 2028. This will involve investing in a range of green assets, such as energy storage, solar, nuclear, smart meter assets, preparing for hydrogen and carbon storage, as well as investing in peaking plants to support the energy transition.

In our response to the Energy Security and Net Zero Committee's inquiry, we recommend that the Government provide a robust framework in which to support the creation of new energy infrastructure, from funding through to planning and connections.

We support Government's technology agnostic approach to the future energy mix and encourage it to continue to take an open approach, even where technologies are not yet proven to their full extent.

We encourage prioritising grid connections in future planning. Storage requirements will evidently be higher given the weather-dependence of renewable sources, and so we encourage mechanisms and investment structures which support new storage facilities required for the net zero future.

Committee Questions

1. Is the energy sector open enough to new generation technology?

We support Government's technology agnostic approach to generation technology, but we believe there are a number of changes to the policy framework that need to be made to ensure businesses have the certainty and incentive to invest in new technologies.

Hydrogen

- Hydrogen will likely play a role in decarbonising sectors that cannot be easily electrified, particularly industrial processes and heavy transport. However, there is potential for hydrogen to play a key role in providing flexibility in the power sector and supporting a transition to a decarbonised gas supply, benefitting hard to retrofit homes and fuelling transport (through large vehicles).
- We welcome the Government's intention to consult this year on the potential design options for a market intervention to support hydrogen to power as announced in the Energy Security Plan. We view accelerating hydrogen to power as a significant component to achieving the Government's target of having a fully decarbonised power sector by 2035. Additionally, in the short/medium-term, the Government's target of 10GW low-carbon hydrogen production capacity by 2030 can be met through green and blue hydrogen. However, there is currently no support mechanism in place to support hydrogen and hydrogen derivatives to power.
- Additionally, a Contracts for Difference (CfD) style model is being developed to help accelerate hydrogen production in the UK (the Hydrogen Production Business Model). However, the bureaucratic process from creating a submission to being awarded a contract (currently takes between 9 – 12 months) is inefficient and the mechanism is seen by developers and investors as overly complex. We would recommend that the Government accelerate this timeline while

providing more clarity around the process and simplifies it where possible. Risk taking intermediaries and hydrogen blending must be supported under this mechanism to help support the development of a liquid, functioning market for hydrogen.

DSR

- Demand Side Response (DSR) has the potential to support the transition to the future generation mix by acting as an enabler to the deployment of new generation technologies, in particular intermittent or inflexible low carbon generation. DSR provides elasticity in energy demand to accommodate intermittent generation patterns, including the ability to:
 - Reduce demand when levels of generation are low, reducing the need for additional flexible, often high-carbon, generation capacity to be kept available to operate during times of scarcity when prices are high.
 - Increase demand when the output of intermittent generation is excessively high, reducing the need to pay generators to turn-off.
- Whilst the energy sector is currently open to several types of DSR technologies, there are barriers to unlocking the full potential of DSR to support the growth of new generation technologies. Most of these barriers arise from a fragmented market landscape where different DSR products and services are not coordinated and prevent the full value to the energy system provided by each megawatt of DSR from being realised.

2. Does the Government sufficiently support development of innovative energy infrastructure?

Grid connections

- We believe Government could do more in this area. For example, our low carbon projects are facing substantial delays, and costs, in obtaining connectivity, as are flexible assets like energy storage. This represents the biggest current blocker to deploying low-carbon and flexible technologies, both as stand-alone generation assets and energy schemes vital to improving the efficiency of manufacturing and the public sector e.g., hospitals.
- Although we agree with many of the recommendations by the Electricity Networks Commissioner, Nick Winser, on halving the time to deliver new transmission grid, these will take time to have an impact. We are of the view that radical reform of the grid connections process is the only way of achieving improvement in the short and medium-term. Our proposals to resolve the grid connections issues include:
 - Radical action to remove stalled projects from the queue to connect. These projects are blocking more viable schemes from entering construction and are causing the triggering of costly and potentially unnecessary network reinforcement works.
 - A use it or lose it principle (which is a feature in other regulated industries) and would result in the connection being revoked.
 - Tighten up the rules on changes to projects that are yet to connect from changing technology e.g., changing a gas-fired combined cycle gas turbine to electricity battery storage. We believe that the ability for sites that are already connected to evolve is essential. However, where projects have a connection, but are not yet built, changing the technology causes delays for projects that are ready to build. In cases such as these, projects should exit the queue and restart the process.
 - Give network operators the power to remove defunct projects or those with overstated generation capacity based on their real-world performance over a number of years. This will create capacity, give an accurate picture of active generation and genuine projects on the networks and reduce the need for costly reinforcement projects. Ofgem is due to decide in September on an industry code change that would introduce queue management milestones

to transmission connection agreements, allowing projects to be removed from the queue if they miss set project milestones. We support this change, but unless Ofgem decides to apply the milestones to existing projects in the queue, it will not have any immediate impact.

- We support National Grid ESO's plans to conduct a comprehensive reform of GB connections processes. This must be accelerated and take a whole network approach, capturing processes at Distributed Network Operator (DNO) level. Low-carbon generation connecting at distribution level must often sit in two separate queues – one to connect to the local network and the other waiting for transmission system reinforcement.
- As part of the acceptance of offers to connect, the developer must be able to show that they have access to sufficient funds to build the project. This is to prevent speculative projects blocking the path of projects that are ready to build.
- To ensure that only credible applicants submit their requests, they should be providing performance bonds or guarantees, and their creditworthiness should be assessed.
- The planning process should be amended for critical infrastructure such as new grid supply points and Overhead Lines. The duration of these projects needs to be shortened considerably to enable projects to connect sooner. We broadly support the Electricity Networks Commissioner's recommendations in this area, including on community engagement.
- Allow the transmission networks to be proactive and make strategic investment ahead of need where there is a clear consumer or growth benefit. This would allow the network to be future proofed to support the connection of multiple projects in an area, ensuring the security of our energy supply, rather than the current reactive programmes which contributes to the piecemeal development of our system.
- Government should look at mechanisms to enable third parties to contribute to the cost of the energy infrastructure upgrades required (over and above payments required in their connection agreement) if this could accelerate network upgrades. In return the third parties should receive a guaranteed return of investment over a number of years to smooth out the burden on bill payers.
- We support the April 2023 implementation of Ofgem's Access Significant Code Review which is reducing the cost of most new distribution connections, many of which will be low carbon technologies. Alongside traditional reinforcement, DNOs must use their networks efficiently, maximising use of digitalisation and flexibility solutions to allow more decentralised technologies to connect as the system decarbonises.

Hydrogen storage and blending

- We welcome the addition of hydrogen storage models into the Energy Security Bill. However, industry needs government support to increase technology readiness levels of storage technologies. Other storage technologies such as rock caverns, need significant Development Expenditure (DEVEX) funding to progress and mature. Constructing new caverns, typically within salt strata, will take longer and be more expensive than repurposing existing natural gas storage assets for hydrogen storage.
- In addition to financial support, the Government could look at removing non-economic barriers to innovative technologies such as licencing arrangements to store hydrogen. The Government could amend the licensing and regulations to allow this, which would be welcomed by industry. To advance technology readiness level (TRL) for hydrogen storage, industry is looking for high levels of R&D tax relief to support hydrogen field trials, but do not necessarily require funding. We also welcome the Government's update to market on hydrogen indicating that it is minded

to propose a cap and floor business model for hydrogen storage.

- On blending, we are of the view that this will have an important role in advancing the hydrogen sector, particularly by helping to address volume risk. However, current hydrogen policy would require a new clean technology sector to produce large volumes of low carbon hydrogen while relying on single or small groups of end-use offtakers. This is equivalent to the way things operated in the electricity system 15 years ago, when new wind and solar plants were not allowed to be connected to the grid; and were instead required to use private wires to connect to end users. If this had continued to be the case, the growth of these sectors would have likely stalled. We are calling for the Government to take a positive decision on the strategic role of hydrogen blending into both, the gas distribution and transmission system, and we also need financial support for hydrogen blending under the hydrogen production business model.
- Whilst the nature of blending will be transitional, the investment and scale of hydrogen production which it supports will deliver enduring benefits to consumers and the hydrogen supply chain. Hydrogen production developed through hydrogen blending can ultimately be redirected to 100% hydrogen networks and in the interim can provide important whole-system benefits, such as grid flexibility services. It is therefore a viable investment.

3. Is the Government's plan for energy security sufficiently long term?

- We support Government's focus on the UK's energy independence and, given the geopolitical outlook, we agree that it is crucial for the UK to have robust and secure supply chains. Investors and consumers need a stable framework for a prosperous energy economy and the government will need to work carefully to balance the short-term tensions with the long-term objective of net zero. However, we believe Government should look to take a longer-term view on energy security, including reviewing the energy security needs that come with net zero. While we have a diverse energy mix, we need to ensure our system is sufficiently resilient to withstand any shocks.
- By way of example, the UK is currently reliant on imported gas and has low gas storage levels compared to the EU. Greater storage capacity will be needed in the future as we look to add more renewables and hydrogen to our energy mix.
- The Government needs to create energy markets that are open to new technologies. Doing so would help maximise the potential of wind and solar in terms of delivering system services.
- In response to this, last year Centrica announced the re-opening of Rough – the UK's largest gas storage facility, 18 miles off the coast of Yorkshire – following a major engineering and investment project. The first injection of gas into the site in over five years was made in October 2022. With a storage capacity of up to 30 billion cubic feet (bcf) of gas over winter 2022/23, the re-opening of Rough increased the UK storage capacity by 50%.
- Centrica has since further increased Rough's storage capabilities to 54 bcf, providing the equivalent volume of gas to heat 2.4 million homes over winter. Our long-term aim remains boosting UK energy resilience by turning the Rough gas field into the largest long duration energy storage facility in Europe, capable of storing both natural gas and hydrogen. Rough will help keep prices down for consumers by balancing the UK's gas market, injecting gas into the facility when there is excess supply and putting that gas back into the UK's gas network when customers need it most, keeping prices lower at that point of peak demand. The additional capacity means Rough can store up to 6 days of average UK gas use.
- Developing a core hydrogen storage capability is critical to unlocking the market for hydrogen production and consumption. This is also compatible with a wide range of future scenarios for meeting Net Zero, as well as vital to achieving a secure decarbonised power system by 2035 that is reliant on dispatchable backup hydrogen power generation.

- Government has committed to 10GW of low-carbon hydrogen production capacity by 2030 and the Committee on Climate Change has made clear that urgent action on hydrogen is required to ensure that the UK can meet the Sixth Carbon Budget (2033-2037). This will not be possible without the presence of hydrogen storage infrastructure. This is supported by all of the National Grid ESO Future Energy Scenarios 2022 (FES) which project the need for significant hydrogen storage capacity, potentially growing to up to 55TWh. As such, investment to support hydrogen storage is a 'low-regrets' option on the path to net zero that we should bring forward urgently to maximise the system-wide benefits it can enable.

4. What current technologies could usefully be deployed at scale to deliver better energy security in the UK?

In addition to the points we make above around hydrogen and solar, in this section, we outline the role that domestic Demand Side Response (DSR), energy efficiency and battery storage could play in improving the UK's energy security.

Domestic DSR

- The Government's broader policy direction on shaping the DSR market is the right one, however, more needs to be done on implementation. Currently, network operators have been left on their own to help develop the DSR market however, progress has been slow and there isn't a robust regulatory environment to ensure that the market is developed correctly.

Battery Storage

- We welcome the changes that have been promised with regards to the acceleration of battery storage on the grid, as we see this as an under-utilised resource currently.
- Battery-enabled grid connections will effectively remove pressure on the grid, as more energy solutions are added.

Energy efficiency

- We welcome the introduction of the Great British Insulation Scheme, however, we believe more should be done. One step the Government could take would be to introduce a policy and financial incentive to encourage take up of energy efficiency measures amongst owner-occupiers as this is where there is currently a clear policy gap.

5. Are there technologies that have not been able to develop their potential and should be abandoned?

- It is too early to know which will be the most useful and keeping an open mind will be the most effective strategy going forward. There are companies with a one technology approach who would actively like the Government to pick winners and losers, therefore distorting the market to suit their investment strategies.
- Government should establish an enabling market framework that would determine the most efficient and affordable options while continuing to support innovative technologies until they reach maturity. Removing the barriers to grid connections is significant in achieving this framework.

6. What energy generation mix will get us to net zero the quickest in the most affordable way?

- It is difficult, as above, to assess which mix will get us to net zero the quickest. However, we view that there are certain elements which are required for the success of a speedy and affordable net zero transition. These being storage and grid connections, without which, the future energy mix cannot be deployed. In addition to renewables, we need technologies and

fuels, such as nuclear and hydrogen which will help to manage the intermittent nature of these technologies.

- Whatever the future energy generation mix looks like, we expect there to be a significant role for DSR to play in optimising demand to accommodate changing generation patterns, contribute to increasing energy security, and helping to ensure that the cost of each megawatt is kept as low as possible for consumers.

Solar

- Centrica is developing a portfolio of solar and battery projects and have already completed over 85MW of projects including a 4,000 panels project for the British Army in Yorkshire and 3,000 panels with a total capacity of 18MW at Codford Solar Farm. Our goal is to build a total of 650MW of solar farms by 2026 and grow our battery portfolio over the same period, meaning our low carbon assets could increase by around 900MW.
- The decision by Government to publish a solar roadmap in 2024 is positive, however we would need to see the finer details of the roadmap which we hope would include what type of Government support mechanisms will be provided to increase the use of solar.
- We would like to see solar enabled by the planning system, as currently we see more battery projects in the grid queue, because these projects tend to be easier to get approved than solar.
- There is also a clear skills gap in the solar sector. There's a lack of EPC main contractors in the workforce that we can utilise, which is hindering the growth of the sector. More broadly, the green skills the UK needs are in short supply, including advanced engineering, nuclear, digital, and cyber, computational science, data science, and statistics. Centrica, along with other businesses and trade unions, recently produced a report on the green skills needed to support the energy transition. The report makes a series of recommendations, and we would encourage the committee to consider its findings.¹

Industrial decarbonisation

- Industrial decarbonisation is key to reaching net zero. However, recently, the Government confirmed the first winning projects from its £240m Net Zero Hydrogen Fund, which aims to provide funding for the development and deployment of low carbon hydrogen production.
- The Government's decision not to award funding to any projects in the Humber region (which is the largest and most energy intensive industrial region in the UK) was unexpected – particularly given this had successfully progressed through Phase-2 of the Government's cluster sequencing process in Summer 2022. Energy-intensive industry in the region wants to decarbonise but it is now unclear on the process to do so.

7. Are the energy solutions universal across the UK or are there regional and local approaches on fuel and energy?

- Naturally there will be regional differences, as certain technologies are more suitable in certain areas, such as proximity to North Sea. The Government should tailor its approach and focus on installing the right technologies in the areas of the country where they are most suited to.

¹ Future Energy Skills Report (July 2023): 'The Skills for a Jobs Transition'.
<https://futureenergyskills.co.uk/publications>