

Updated January 2025

Peterhead Carbon Capture Power Station

In response to engagement with our stakeholders, this seeks to address questions raised and provide assurances that SSE is committed to achieving a flexible, reliable and clean power system in a responsible way, adding value for communities and broader society.

What is the role for carbon capture and storage (CCS) in the power system?

As an organisation committed to a net zero future, SSE has plans to invest more than £40bn across the next decade, focused on the projects needed to deliver a clean power system; renewables, networks and flexibility.

To make sure a renewables-led system can truly deliver for the UK, the reality is the system also needs flexibility to provide power when the wind isn't blowing, or the sun isn't shining. At the moment that's delivered through conventional power generation, like the existing Peterhead Power Station. What SSE wants to deliver is flexible generation that is low-carbon in its own right, ensuring the lights are kept on while dramatically reducing emissions.

CCS, attached to a power station, is one way to achieve this. So is switching from natural gas to low-carbon hydrogen as a fuel. These won't be the only sources of flexibility backing up a renewables led system – it will include growing volumes of electricity storage, like batteries and pumped hydro. SSE is investing in all of these areas.

How does CCS align with net zero and a clean power system?

The Climate Change Committee has said that CCS is a necessity, not an option, for delivering net zero and also states gas-fired power stations with CCS are likely to be needed. It sees a requirement for 12-20GW of dispatchable low-carbon capacity coming from a combination of CCS and hydrogen by 2035.

The UK Government published its Clean Power 2030 Action Plan in December 2024, following advice provided by the National Energy System Operator. This outlined the clear role technologies like CCS will play in providing flexible low-carbon backup in a renewables-led system. It set out a range of 2-7GW of low carbon dispatchable power being needed by 2030, which includes power CCS.

SSE agrees that there will be a limited but important role for CCS. Where gas is used – and there's a recognition from organisations like the Climate Change Committee that it will continue to play a role – it must be directed towards low-carbon uses. As the UK power system is decarbonised, power stations with CCS will be able to capture and safely store at least 90% of emissions associated with gas-fired power generation, dramatically reducing CO₂ from the power sector.

SSE's primary focus is on reducing its CO₂ emissions, to achieve net zero across scope 1 and scope 2 by 2040 at the very latest. However, where emissions cannot be entirely removed, SSE believes that negative emissions technologies may be required to neutralise its remaining residual emissions, including those residual emissions expected from a power station with CCS. SSE has begun to investigate technological and nature-based alternative emissions technologies, and is engaging with governments and policymakers as frameworks to support investment in these are developed.

What is planned for the Peterhead site?

SSE is developing a new power station with carbon capture technology, to be located at its existing Peterhead site. Situated on Scotland's east coast, the Peterhead site in Aberdeenshire is ideally placed for carbon capture technology, with access to essential CO₂ transport and storage infrastructure being developed through the Scottish Cluster. The Acorn CO₂ Storage Site, which will be used to safely store CO₂, is located about 100km offshore in rock formations deep below the North Sea.

The new power station would have a generating capacity of up to 910MW, with a net electrical output expected to be around 750MW, as a result of the energy required to run the carbon capture process. The power station is being designed to have a minimum capture rate of 90%, and SSE is aiming for this to be higher. It is estimated that around 1.5mt of CO₂ could be captured and safely stored each year, displacing emissions which would otherwise be released into the atmosphere from a conventional gas fired power station.

A Section 36 Planning Application has been submitted to Scottish Government, covering both the new power station and carbon capture plant. As part of the planning application, it is clearly stated that the new power station would not be built without the carbon capture plant, given the company's commitment to decarbonisation

Will you undertake additional environmental assessments for Peterhead Carbon Capture?

In line with evolving planning policy, we confirmed in October 2024 that we will undertake additional environmental assessments specifically in relation to the assessment of upstream emissions and submit these to the Scottish Government's Energy Consents Unit. This information will be made public and we remain fully confident that planning consent will be granted and that a decarbonised Peterhead will help to keep the lights on, unlock a renewables-led system and create and retain good jobs.

What confidence is there that carbon capture will work?

The proposed new carbon capture power plant at Peterhead would only be constructed following the award of a 'Dispatchable Power Agreement'; a mechanism designed by the UK Government that will ensure a power CCS plant is available to generate while ensuring it is not incentivised to displace lower cost, lower carbon sources of electricity generation, such as renewables.

The Dispatchable Power Agreement also sets out the terms for capturing and storing the carbon from the power station and the requirements for receiving payment. To secure a Dispatchable Power Agreement CCS power stations must be designed for a minimum projected capture rate of 90% when running at full load¹. It is set out in the Environmental Impact Assessment for the new station, as part of the planning process, that plant operation will be based on a minimum 90% capture rate.

SSE is aiming for this to be higher, working with a world-leading supply chain to deliver the combined power station and carbon capture plant. This includes Mitsubishi Heavy Industries, Mitsubishi Power, Worley and Tecnicas Reunidas. Mitsubishi Heavy Industries has successfully demonstrated capture rates of between 95% and 98% from a gas turbine. This was achieved at Technology Centre Mongstad in Norway, one of the world's largest carbon capture demonstration facilities that is recognised for its state-of-the-art equipment and specialised expertise.

¹ The Dispatchable Power Agreement which was recently agreed by the Department for Energy Security and Net Zero with Net Zero Teesside Power Limited, following a period of detailed technical design and government due diligence, contains a "CO₂ Capture Rate Estimate" of 96%.

SSE is also investing, as part of a UK Government backed project, to further reduce carbon emissions by allowing for consistent capture levels of between 95% and 99% to be achieved.

What will happen to the existing Peterhead Power Station?

The existing Peterhead Power Station has played a significant role in providing reliable electricity since opening in 1982. Investment in the asset has seen it move from burning heavy fuel oil to natural gas, with a significant repowering exercise undertaken in 2000. This site is reaching the end of its engineering life.

Until recently, the Peterhead Power Station was expected to close by 2030. However, the UK's lack of progress in deploying alternative low carbon flexibility – like CCS – means the power system may require the station into the 2030s. As a result of this slower pace, there may be a limited period where both plants operate simultaneously. However, even in this scenario, with a low-carbon alternative using CCS on the same site, the existing power station would be expected to see significantly reduced running and therefore the net effect of building the new project would be to materially reduce overall emissions.

What is being done to ensure that the electricity grid can meet the demands of new power generation?

SSEN Transmission is moving fast to develop the North of Scotland transmission network to. It is investing over £20bn to upgrade the network in key areas of the north of Scotland through the 'Pathway to 2030' programme. This substantial investment will be imperative to ensure that more renewable and low-carbon electricity can be harnessed, connected to the grid and transported to where it is needed. Work is already under way for Eastern Green Link 2 – an electrical 'superhighway' connecting Peterhead to North Yorkshire – which will unlock Scotland's rich renewable electricity capacity and enable export of low carbon flexible generation, like CCS. Please see link for more information on this: [Pathway to 2030](#).

How are you managing the impact of your operations?

Managing any impacts along with maximising associated benefits is an important factor in delivering for our community around Peterhead and beyond.

Our existing operations are undertaken in line with our environmental permit which is independently monitored by Scottish Environmental Protection Agency (SEPA) Strict procedures are in place to ensure that our generation activity is regulated and compliant. Potential impacts such as associated operational traffic and noise are also monitored, with permits and management plans in place to ensure compliance.

Sites like Peterhead play a key role, not only in delivery the energy needed on the system, but also in delivering value for the communities in which they sit. The current power station has 80 full time employees and supports up to 30 contractors permanently on site and the proposed new facility could see in the region of an additional 1,000 jobs created during construction and around 240 long term skilled jobs being supported during each year of operations.

Working with communities is at the heart of SSE's development process. For the Peterhead carbon capture project, SSE undertook a two-stage consultation, contacting over 10,000 members of the local community, businesses, elected representatives and community councils. 108 responses to the consultation were received across this period. The published pre-application consultation report covers the breadth of our engagement: <https://www.ssethermal.com/media/ixlffqvv/pac-report.pdf>. SSE prioritises engaging with and using local businesses, to ensure a positive impact is delivered through the construction and operation of the new power station.