

About Acorn CO₂ SAPLING

The Acorn CO₂ SAPLING project is the CO₂ transport infrastructure element of the Acorn CCS project. Acorn CCS is a low-cost, low-risk, industrial-scaled carbon capture and storage (CCS) project designed to be built quickly and take advantage of existing oil and gas infrastructure and a well understood offshore CO₂ storage site. With the right support, **Acorn CCS could be operating in the early 2020s, helping the UK and its North Sea neighbours meet their climate targets and providing a blueprint for the decarbonisation of other regions dependent on the fossil fuel industry and its products.**

The Acorn CCS project's hub is located at the St Fergus Gas Terminal in North East Scotland, an active industrial site where approximately 35% of all the natural gas used in the UK comes onshore.

Acorn can provide:

- An **international CO₂ storage hub with ready access to licensed storage sites in the Central North Sea** that unlocks CO₂ transportation and storage solutions for other UK and European carbon capture, utilisation and storage (CCUS) clusters
- A **repurposed onshore and offshore CO₂ pipeline infrastructure** to transport emissions for offshore sequestration
- An **economic opportunity** for the deep-water port at Peterhead
- A **major clean hydrogen production opportunity** at the St Fergus gas terminal

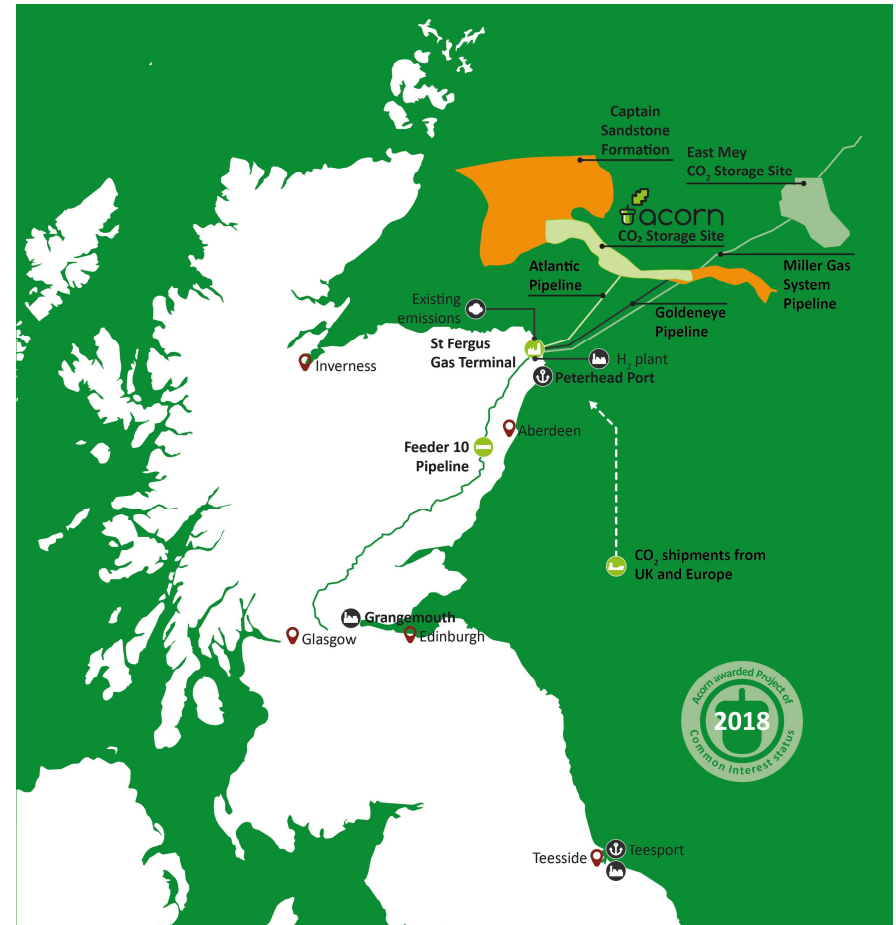


Figure 0-1 The Acorn CCS Project



CO₂ SAPLING

CO₂ Shipping And PipeLine Infrastructure and North Sea ReGeneration

The Acorn CO₂ SAPLING Transport Infrastructure Project (Acorn CO₂ SAPLING), aims to establish a strategic and transnational CO₂ transportation infrastructure capable of delivering over 12Mt/y of CO₂ from emissions sources around the North Sea for permanent sequestration in deep geological storage sites located beneath the Central North Sea.

In addition to supporting the development of key European CO₂ transportation infrastructure, **Acorn CO₂ SAPLING will provide a model and template for similar hubs in Europe and elsewhere** where petroleum assets may be suitable for re-use and thereby deliver significant transnational benefits.

The Acorn CO₂ SAPLING Transport Infrastructure Project has a long-term outlook to 2060, the expected operational lifetime of current assets. This aligns well with the EU vision of CO₂ emissions reduction targets, and there is no reason why this initiative cannot continue beyond this timeframe due to the significant potential capacity within the North Sea for the permanent, safe and cost-effective storage of CO₂.

The Acorn CO₂ SAPLING Transport Infrastructure Project is included in the third list of Projects of Common Interest and has applied to be included in the fourth list of PCIs, the outcome of which will be known in September 2019.

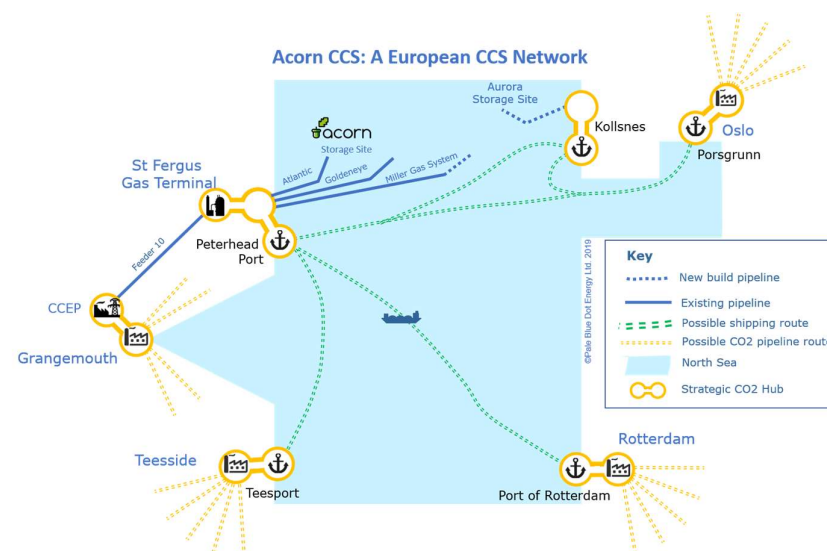


Figure 0-2 Illustration of the CO₂ SAPLING PCI ambition and the potential transnational connectivity

What are Projects of Common Interest?

Projects of Common Interest (PCIs) are key cross border infrastructure projects that link the energy systems of EU countries. They are intended to help meet the energy policies and climate objectives of the EU and member states: affordable, secure and sustainable energy for all citizens, and the long-term decarbonisation of the economy in accordance with the Paris Agreement.

PCIs have access to a total of €5.35 billion in funding representing part of the Connecting Europe Facility (CEF), the European Union's €30 billion fund for boosting energy, transport, and digital infrastructure between 2014 and 2020. This funding is intended to speed up the projects and attract private investors.



Feasibility Study

This Project feasibility study received funding from the European Commission under the Connecting Europe Facility (CEF) (Action number 12.2-0001-UKNL-S-M-18), the Department for Business, Energy and Industrial Strategy (BEIS), the Scottish Government, Total E&P UK Ltd (Total) and PBDE who are leading the Project.

The study focussed on the technical feasibility and business arrangements to enable the re-use of the existing offshore pipeline, the onshore Feeder 10 pipeline, and the enablement of the import and export of CO₂ through Peterhead Port.

Study Findings

The work undertaken has **confirmed the suitability of the Atlantic and Goldeneye offshore pipelines to be repurposed for transporting 5Mt/yr CO₂ and 4Mt/yr CO₂, respectively.**



The Feeder 10 onshore gas pipeline could be repurposed to transfer 3Mt/yr of CO₂ captured from emissions from the Grangemouth area, increasing to 6Mt/yr CO₂ with the installation of an intermediate CO₂ compression station. Future scenarios, provided by National Grid (National Grid Gas, 2018) forecast that peak gas supply from St Fergus will decline. **Other existing onshore pipelines have the spare capacity for the additional gas if Feeder 10 is repurposed for CO₂ transportation.**

A new-build CO₂ compression plant constructed at the St Fergus industrial site could transport locally captured and build-out



quantities of CO₂ to the Acorn CCS project offshore storage sites.



Acorn build-out options include using existing Peterhead Port infrastructure and a local industrial site to transport up to 3Mt/yr of imported CO₂ to St Fergus via an inland pipeline. Larger vessels can be accommodated within Peterhead Port which could see 6Mt/yr CO₂ arrive at St Fergus.



A business model for the Acorn CCS project, that could also be applied to future CCS projects, is under discussion with BEIS. PBDE is developing heads of terms with BEIS during 2019 in anticipation of a bilateral agreement ahead of a **Final Investment Decision in 2020/21.**

Key findings from this study:

- ☛ **North east Scotland is a natural hub for the transport and storage of CO₂ from elsewhere in the UK and Europe.**
- ☛ **No showstoppers have been identified with developing the CO₂ transport and infrastructure of the Acorn project**
- ☛ **The Acorn CO₂ SAPLING Transport Infrastructure Project has synergies with the Northern Lights project (another PCI fourth list candidate)**
- ☛ **PBDE are currently developing credible business models for both the transport and storage of CO₂**

