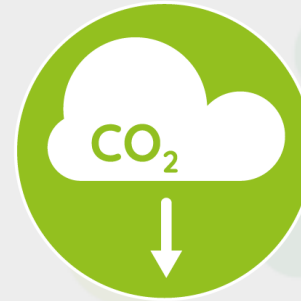




ACT Acorn, project 271500, has received funding from BEIS (UK), RCN (NO) and RVO (NL), and is co-funded by the European Commission under the ERA-NET instrument of the Horizon 2020 programme.



ACT Grant number 691712.



# What role for CCS in a delivering just transitions?

## An evaluation of the North Sea region

25<sup>th</sup> November 2019

Floris Swennenhuis, Radboud University

The ACT Acorn Consortium is led by Pale Blue Dot Energy and includes The Bellona Foundation, Heriot-Watt University, Radboud University, Scottish Carbon Capture & Storage (SCCS), University of Aberdeen, The University of Edinburgh and University of Liverpool.





Enabling CCS in the UK

Initiating clean hydrogen

Decarbonising industry



# Acorn Overview



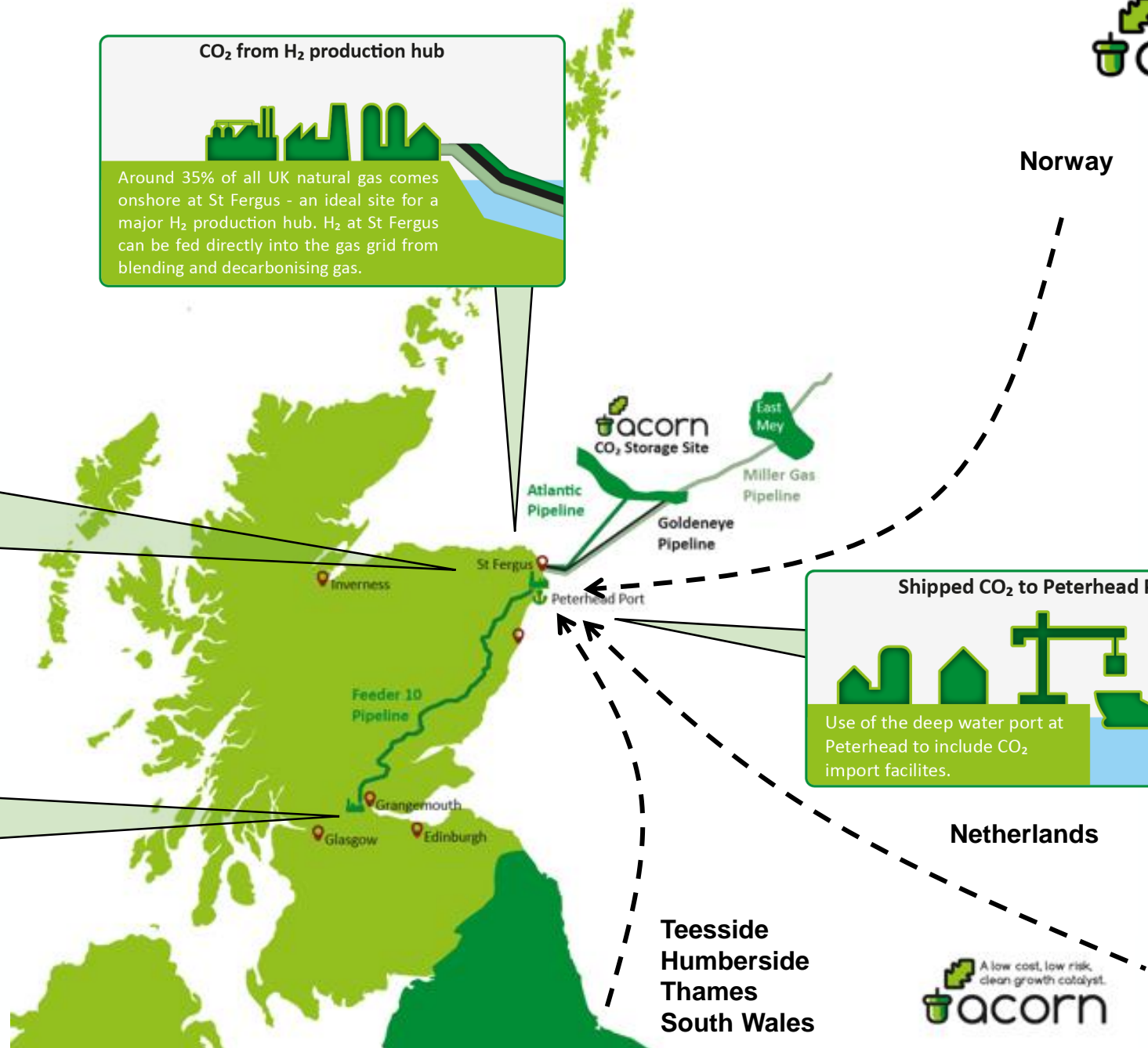
**World class CO<sub>2</sub> stores**  
 Two large, well understood CO<sub>2</sub> stores with plenty room for growth.

**Pipeline reuse**  
 More than £750 million cost savings from reuse of high capacity on and offshore pipelines.

**Low cost CO<sub>2</sub>**  
 200,000 tonnes of existing CO<sub>2</sub> from the St Fergus Gas Terminals.

**CO<sub>2</sub> from H<sub>2</sub> production hub**  
 Around 35% of all UK natural gas comes onshore at St Fergus - an ideal site for a major H<sub>2</sub> production hub. H<sub>2</sub> at St Fergus can be fed directly into the gas grid from blending and decarbonising gas.

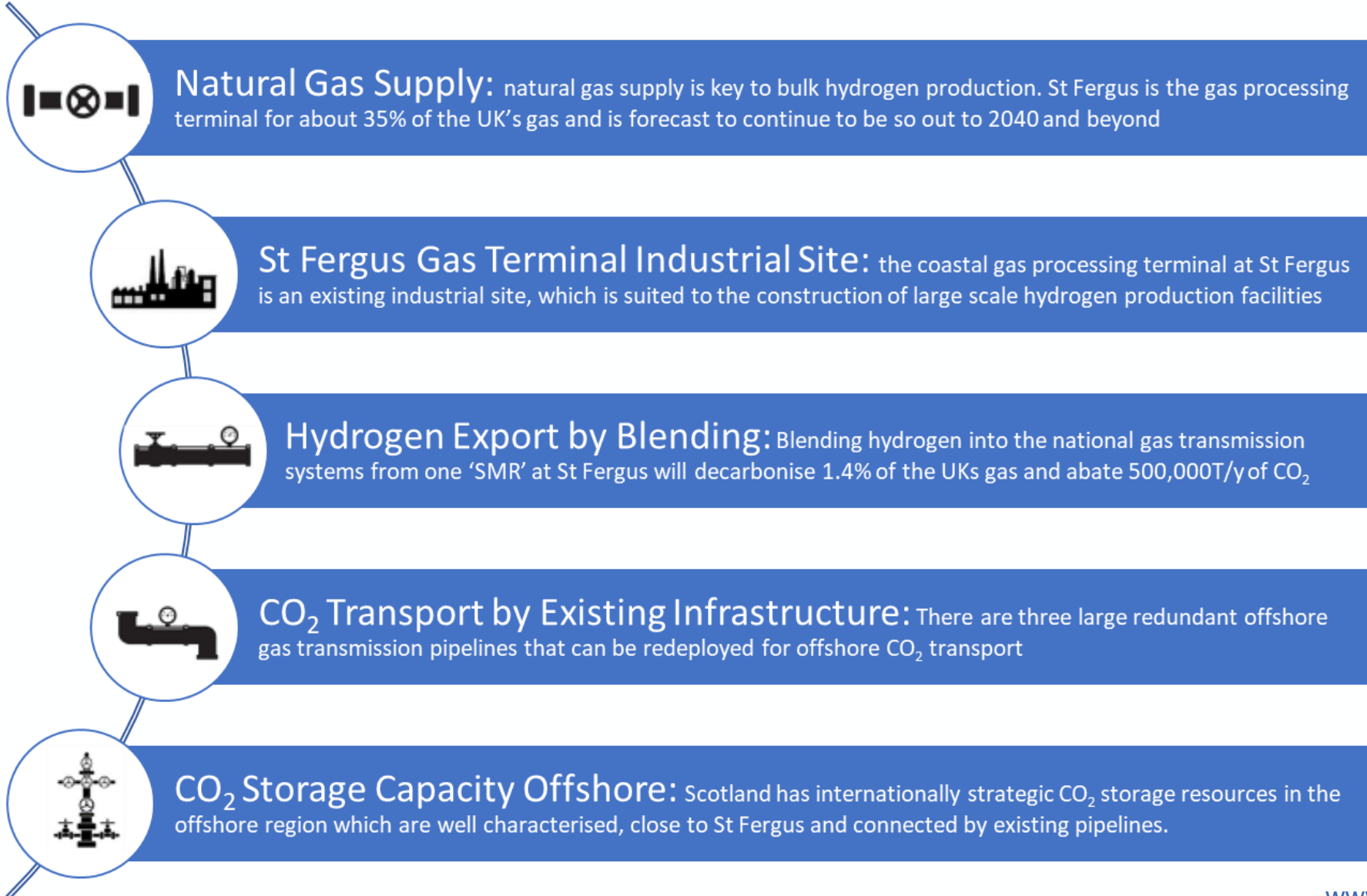
**CO<sub>2</sub> from Grangemouth cluster and beyond**  
 CO<sub>2</sub> from Grangemouth cluster piped to St Fergus through Feeder 10 - a natural gas pipeline ready for reuse.



**Shipped CO<sub>2</sub> to Peterhead Port**  
 Use of the deep water port at Peterhead to include CO<sub>2</sub> import facilities.



# Acorn: St Fergus is a strategic location



# Acorn feasibility study

- Assessment of geological CO<sub>2</sub> storage sites
- Explore options for re-use of oil and gas assets such as pipelines and platforms
- Consider a stepped approach to develop CCS in north-east Scotland to minimise cost
- Outline the potential for producing hydrogen from natural gas with CCS
- Consider how a project such as Acorn can support a just transition to a decarbonised future

**Acorn: Developing full-chain industrial carbon capture and storage in a resource- and infrastructure-rich hydrocarbon province.**

/ Alcalde et al Journal of Cleaner Production, Vol. 233, 01.10.2019, p. 963-971.

# Acorn Project Timeline



Today...

- Detailed design studies for Acorn CCS
- Hydrogen Supply competition bid for Acorn Hydrogen

Early 2020's...

- Financial Investment Decision (FID) 2021
- Acorn CCS construction
- Acorn CCS on line 2024

Mid 2020's...

- Acorn Hydrogen 2025
- Acorn CCS build out opportunities
- Acorn Hydrogen growth

# Acorn Project Status



TOTAL

Pale Blue Dot.





More information: <https://pale-blu.com/acorn/>  
<https://www.actacorn.eu/>

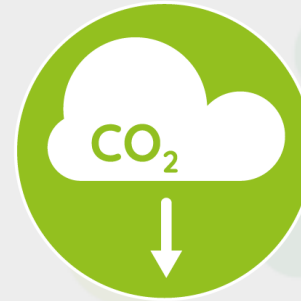




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## An evaluation of the North Sea region

21<sup>st</sup> November 2019





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## Key contributors

-  Leslie Mabon, Robert Gordon University
-  Heleen de Coninck, Radboud University
-  Todd Allyn Flach, The Bellona Foundation
-  Floris Swennenhuis, Radboud University



## Research focus






Achieving a  
'just transition'  
to 2050

What role, if any, do **stakeholders** think carbon capture and storage  
**(CCS)** has in helping to achieve a more  
**environmentally sustainable future** in regions whose workers and  
economies rely on **carbon intensive industries?**



# Data collection








**Three high-emitting industrial areas bordering the North Sea with the potential for CCS...**

-  In-depth stakeholder interviews (government, industry, ENGOs, trade unions)
-  Question guide based on Scotland
-  Wider citizen and stakeholder focus groups





# Analysis

-  Qualitative analysis
-  Codes developed in collaboration
-  Skills for a just transition
-  Transition as an opportunity
-  Responsibility
-  Scale of action
-  Viability of CCS



# North East Scotland findings



## Benefits and public interest

Questions around who benefits from CCS and how to manage CCS developments in the public interest.



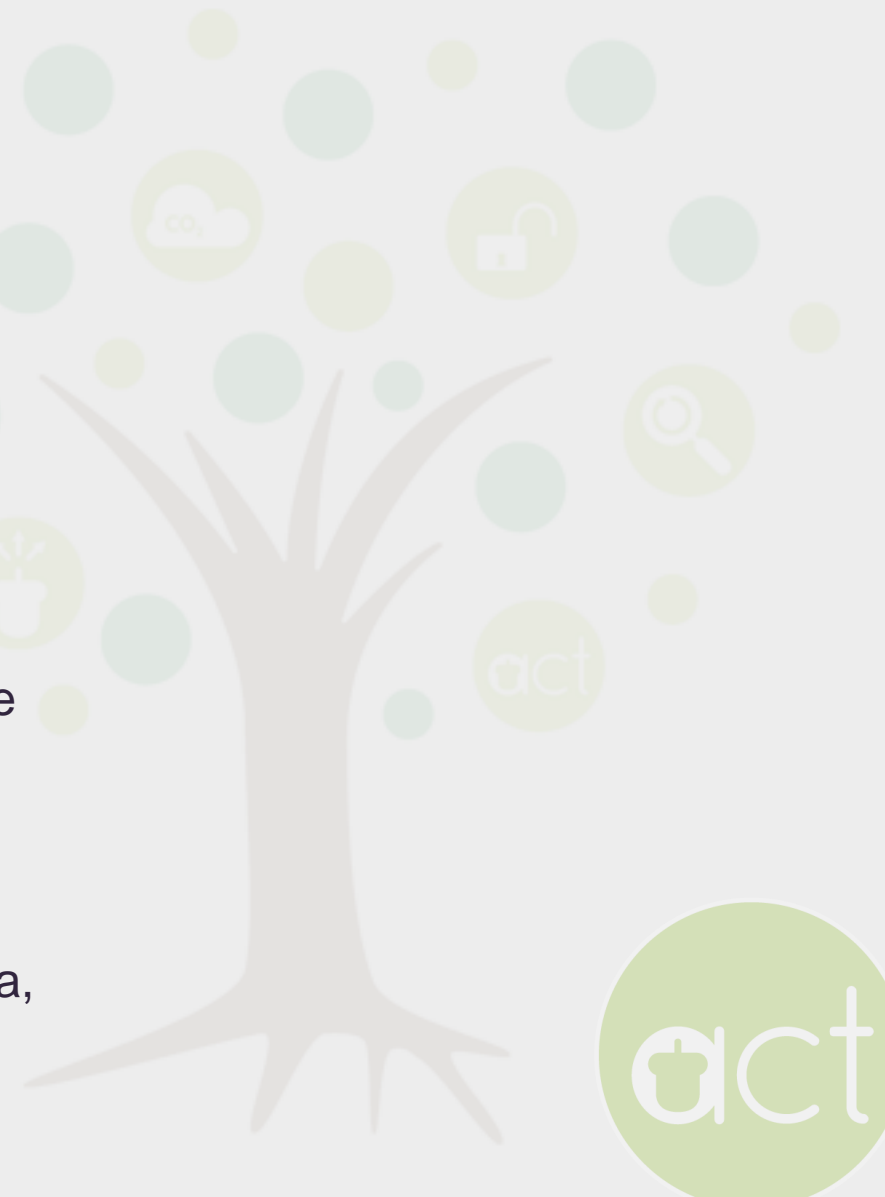
## Respect for workers

Strong sense of identity and history comes from the oil and gas industries that needs to be valued.



## Infrastructure reuse

Infrastructure reuse can help transform an area, stakeholders instantly make connections with decommissioning.



# Wider implications for other regions



## Role for local government

Expectation that city/regional governments should take the lead in setting out local pathways for a just transition.



## Lack of understanding

In carbon-intensive regions with limited connection to subsurface oil and gas activities, understanding of the role of CCS in a just transition is less apparent.






## Differing views on environmental impact

Opponents generally see CCS as a (maybe) necessary evil, proponents think of CCS as a stepping stone towards a hydrogen and with potential for negative emissions










# CCS as part of a just transition

-  Make a contribution to climate change imperatives
-  Help mitigate the economic and employment effects arising from declining or maturing industries
-  Helps redress (or at least does not increase) uneven vulnerabilities and inequalities in society





# Key opportunities and challenges

-  Evidence of skills in carbon industries matching up with CCS
-  Framing of CCS as just one part of a transition to a more economically, socially and environmentally sustainable future
-  Positive narrative around CCS as benefitting communities
-  Engagement with local authorities as facilitators
-  The need for succesful demonstration projects



# Acorn CCS in context



act

Developing Acorn CCS to become an open CO<sub>2</sub> transport and storage hub reduces risks and improves the business case for Acorn CCS itself and wider European CCS projects.



act

Acorn CCS and a European CCS Network will facilitate the creation of climate-proof industrial clusters that can withstand growing political and financial pressures associated with climate concerns of the 21st century.

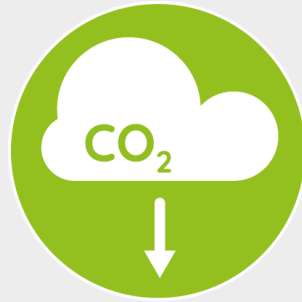


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By promoting a cross-sectoral just transition, Acorn CCS helps transform a key fossil fuel industry into an essential part of the zero carbon economy.



act



# Thank you

[www.actacorn.eu](http://www.actacorn.eu)

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