

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.

Acorn

ACT Knowledge Exchange

13th November 2018

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www.actacorn.eu

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

Acorn Overview



World class CO₂ stores

Two large, well understood CO₂ 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 CO₂

200,000 tonnes of existing, easy to capture CO₂ from the St Fergus Gas Terminals.

CO₂ from H₂ production hub



Around 35% of all UK natural gas comes onshore at St Fergus - an ideal site for a major H₂ production hub. H₂ at St Fergus can be fed directly into the gas grid from blending and decarbonising gas.



acorn
CO₂ Storage Site

Atlantic
Pipeline

East
Mey

Miller Gas
Pipeline

Goldeneye
Pipeline

St Fergus

Peterhead Port

Inverness

Feeder 10
Pipeline

Grangemouth

Glasgow

Edinburgh

Shipped CO₂ to Peterhead Port



Use of the deep water port at Peterhead to include CO₂ import facilities.

CO₂ from Grangemouth cluster and beyond



Feeder 10
Gas Pipeline

CO₂ from Grangemouth cluster piped to St Fergus through Feeder 10 - a natural gas pipeline ready for reuse.

Netherlands

Teesside



A low cost, low risk,
clean growth catalyst.

Acorn ACT - Overcoming hurdles to CCS

- 19 month, €2.9m project (grant of €2m)
- Create a specification for an ultra-low cost, integrated CCS hub that can be scaled up at marginal cost ✓
- Evolve the Acorn development opportunity from proof-of-concept (TRL3/4) to the pre-FEED stage (TRL5/6) ✓

Subsurface science

- Understanding storage efficiency ✓
- Geomechanics and rock strength ✓
- Site selection & evaluation ✓

Policy recommendations

- Just transition – regional ✓
- Decommissioning infrastructure ✓
- Infrastructure re-use for CO₂ ✓

Economic efficiency

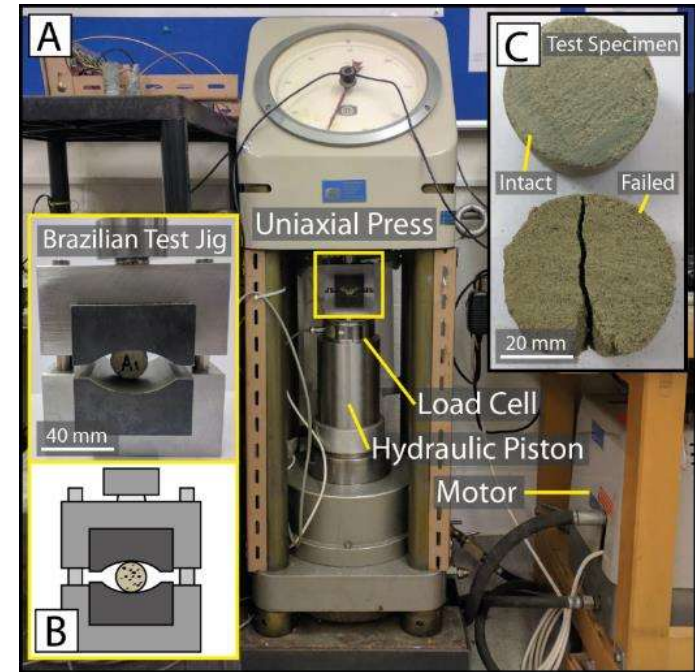
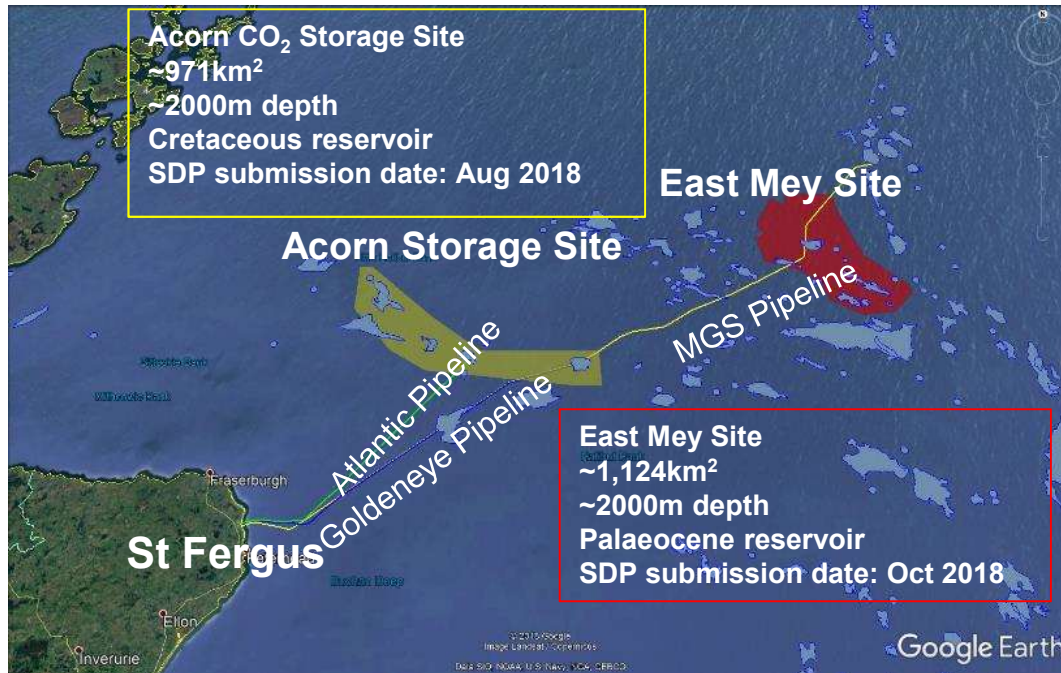
- Minimum viable development ✓
- Growth and build out ✓
- Business models ✓

Societal impact

- Perceptions and acceptance ✓
- Replication around the World ✓
- Life-cycle analysis ✓

17/21 deliverables and 6/8 milestones completed

Subsurface

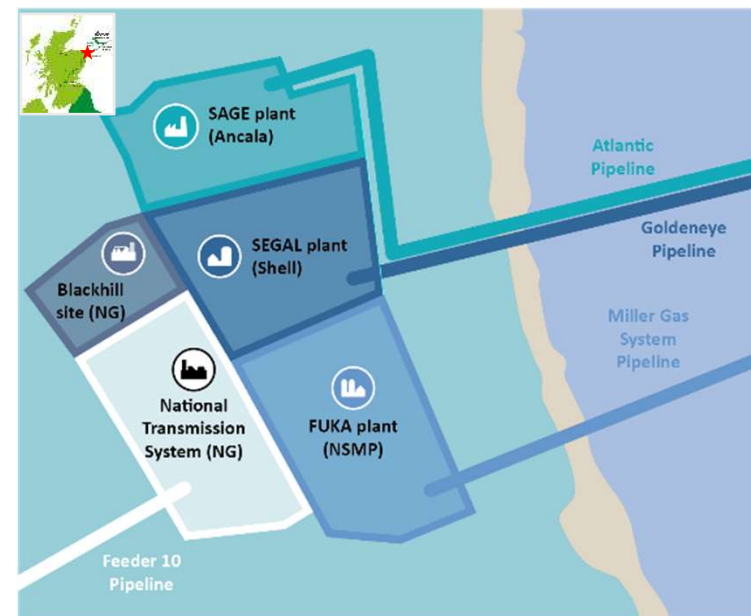


- Storage Site Selection – East Mey
- Geomechanical Rock Testing
- Storage Development Plan

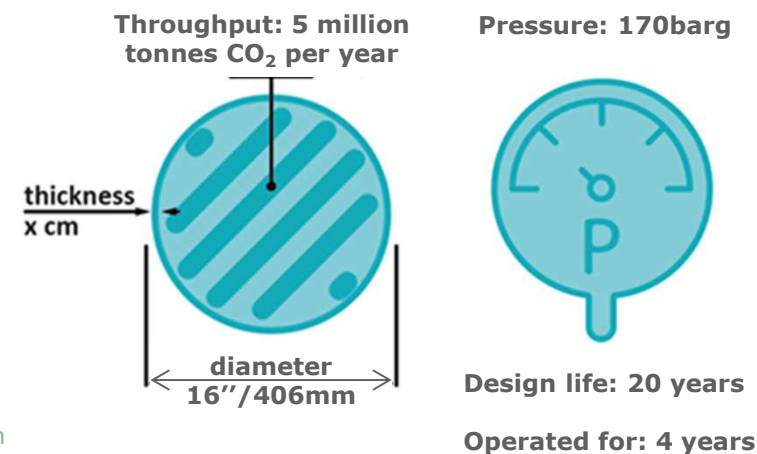


Re-use of Infrastructure

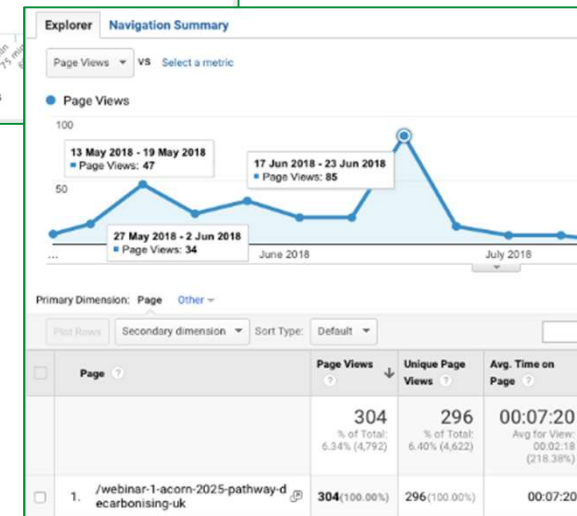
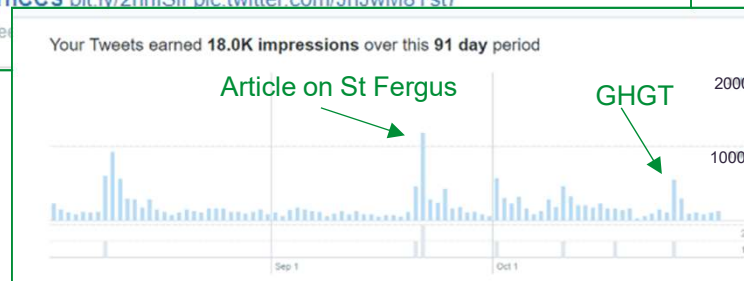
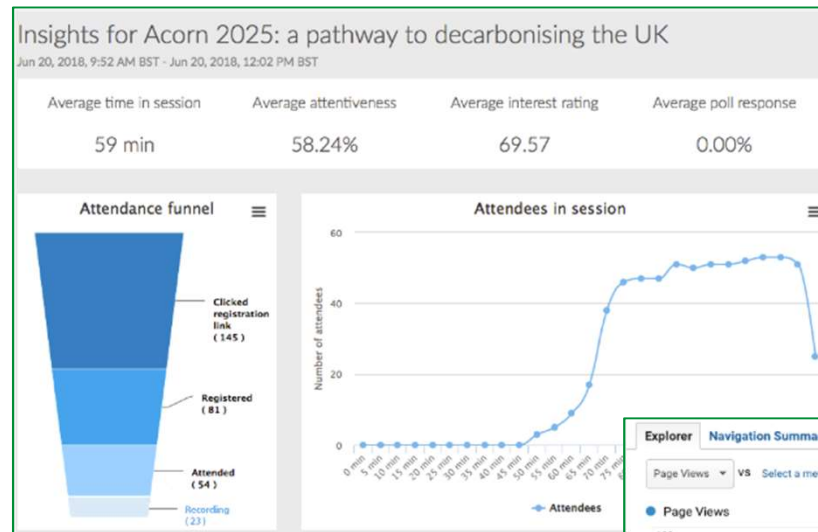
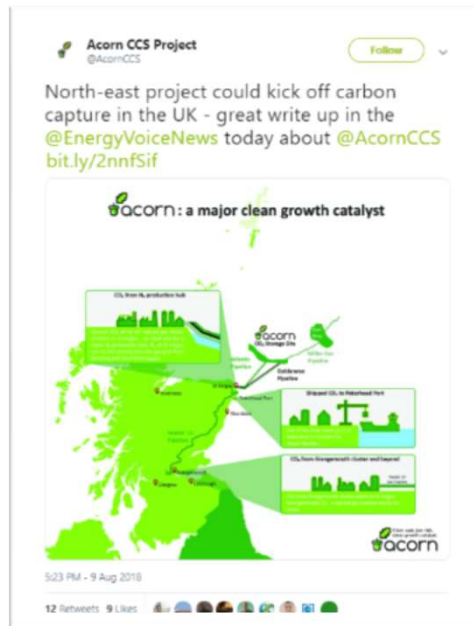
- Re-use on case-by-case basis
 - Business case vs new-build pipeline
 - Address technical risks
- Preserving existing pipelines can:
 - Reduce capital expenditure
 - Accelerate CCS deployment
- Once pipelines redundant, mothball for >10y without compensation unlikely
- Strategically important pipelines should be prioritised for preservation
 - Government needed to take on costs and/or remove liabilities from current owners



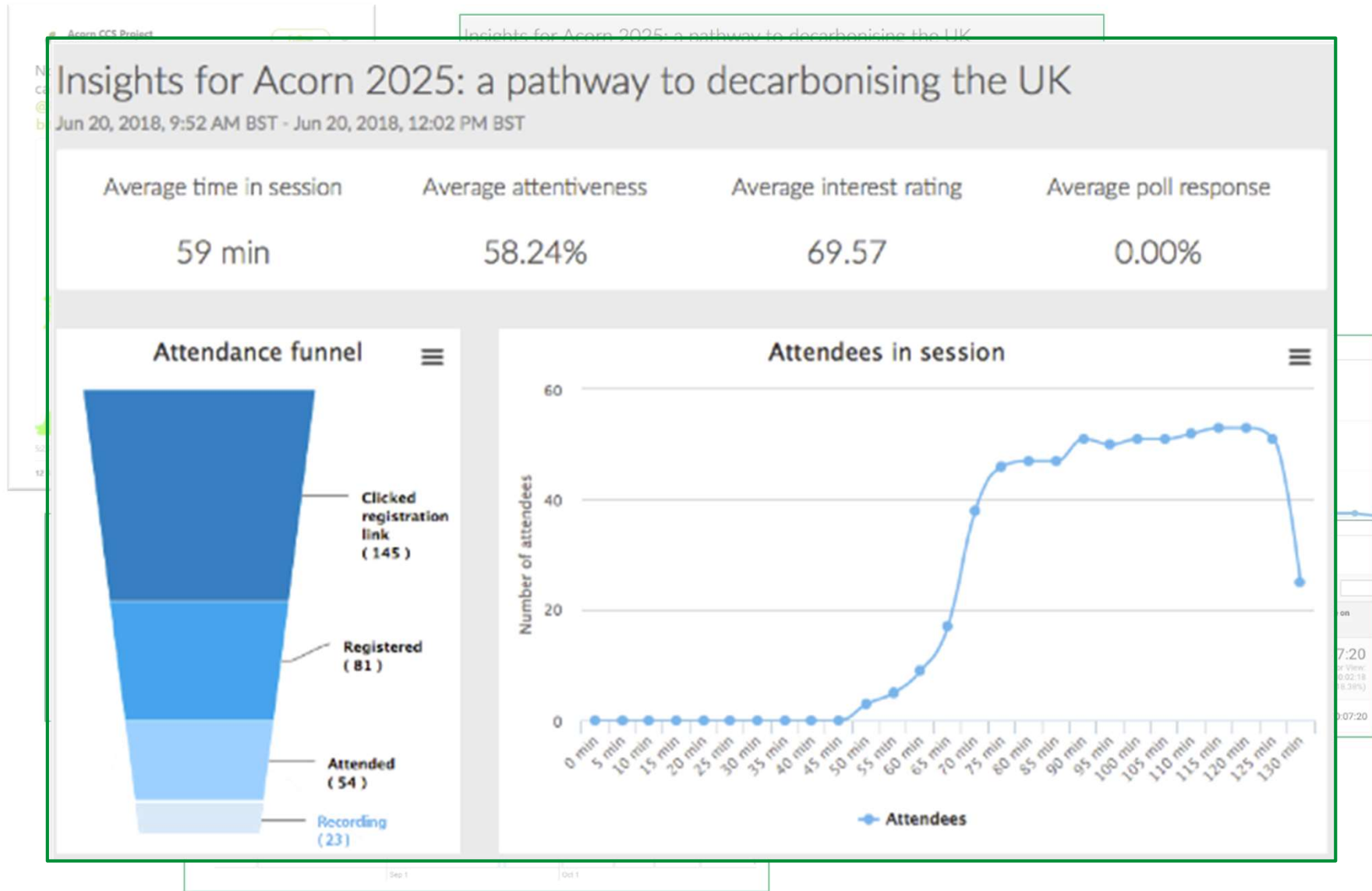
Atlantic Pipeline



Reach-out: social media & webinar



Reach-out: social media & webinar



Reach-out: Events

- Public engagement
(Unearthed: Explore the world at your feet)
- GHGT papers and videos
- Accelerating CCUS: A Global Conference to Progress CCUS (Edinburgh 28 / 29 November 2018)
- FINAL EVENT – London, audience of decision-makers (January 2019)



Unearthed: queuing up to learn about CCS



Floris - GHGT – ACT Acorn Project

<https://www.youtube.com/watch?v=KcxgVV7dsPI&feature=youtu.be#JustTransition>

Reach-out: Just Transition

Social acceptance study - Just Transition workshops and interviews

- Increasing interest in Scotland – especially trade unions and NGOs
- Potential for CCS – balancing skills within O&G industries with climate mitigation imperatives
- Awareness of CCS is low within Scotland just transition movement
- Positioning CCS within a just transition framing – ‘just transition’ can mean different things to different organisations



Focus Groups in Aberdeen



Internal Collaboration

Communication

- Weekly calls – Team lead
- Monthly 2-day collaborative meetings
- Small sub-groups on specific deliverables
- Quarterly meetings

What worked well

- *Internal comms* – subsurface meetings
- *Skype for Business* – screen share, messenger
- *SharePoint* – go-to place for: contacts, roles, calendar, files. Built in version control, collaborative documents.
- *One-Note* – notes, collaborative work area

Could be improved

- Collaborative document working
- File structure awareness upfront



Linkage with other ACT Projects

- Workshop social science research across ACT
 - Sharing information
 - Avoiding duplication
 - Stakeholder management
- Sharing value
 - Webinar software
 - Knowledge sharing between SCCS partners and UK projects
 - ALIGN/Acorn discussion
 - Lyell Centre – co-location of BGS/HWU/SCCS





Acorn Status



Acorn CCS



Feasibility Engineering
Underway



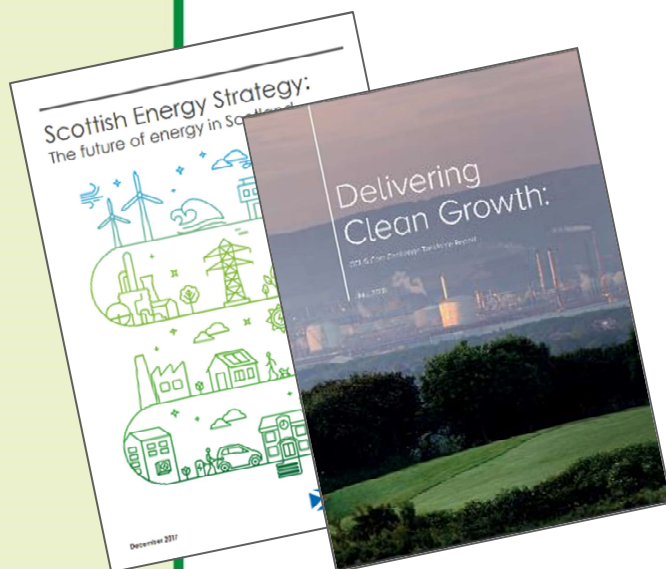
Department for
Business, Energy
& Industrial Strategy

£2.3m BEIS grant
through Horizon2020



The Scottish
Government
Riaghaltas na h-Alba

£100k grant from
Scottish Government



Lease Option



Oil & Gas
Authority

CO₂ Storage Licence



PCI 3rd List and First
CCS project to be
awarded CEF funding



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Thanks for listening!

For more info – please check out www.actacorn.eu

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ACT Acorn Consortium