



**UP HERE TOO MUCH
CO₂ IS A PROBLEM**

**THE PETERHEAD
CARBON CAPTURE
AND STORAGE PROJECT**

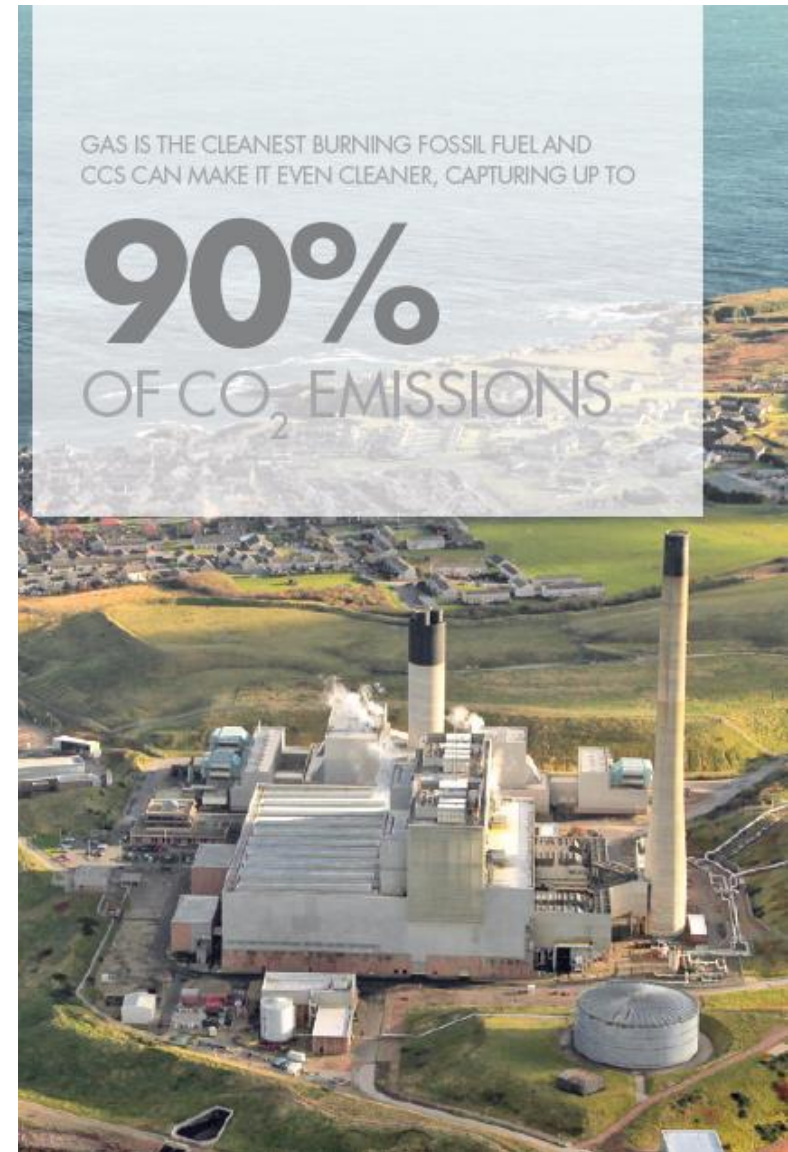


**DEEP DOWN UNDER
THE NORTH SEA
THERE IS A SOLUTION**

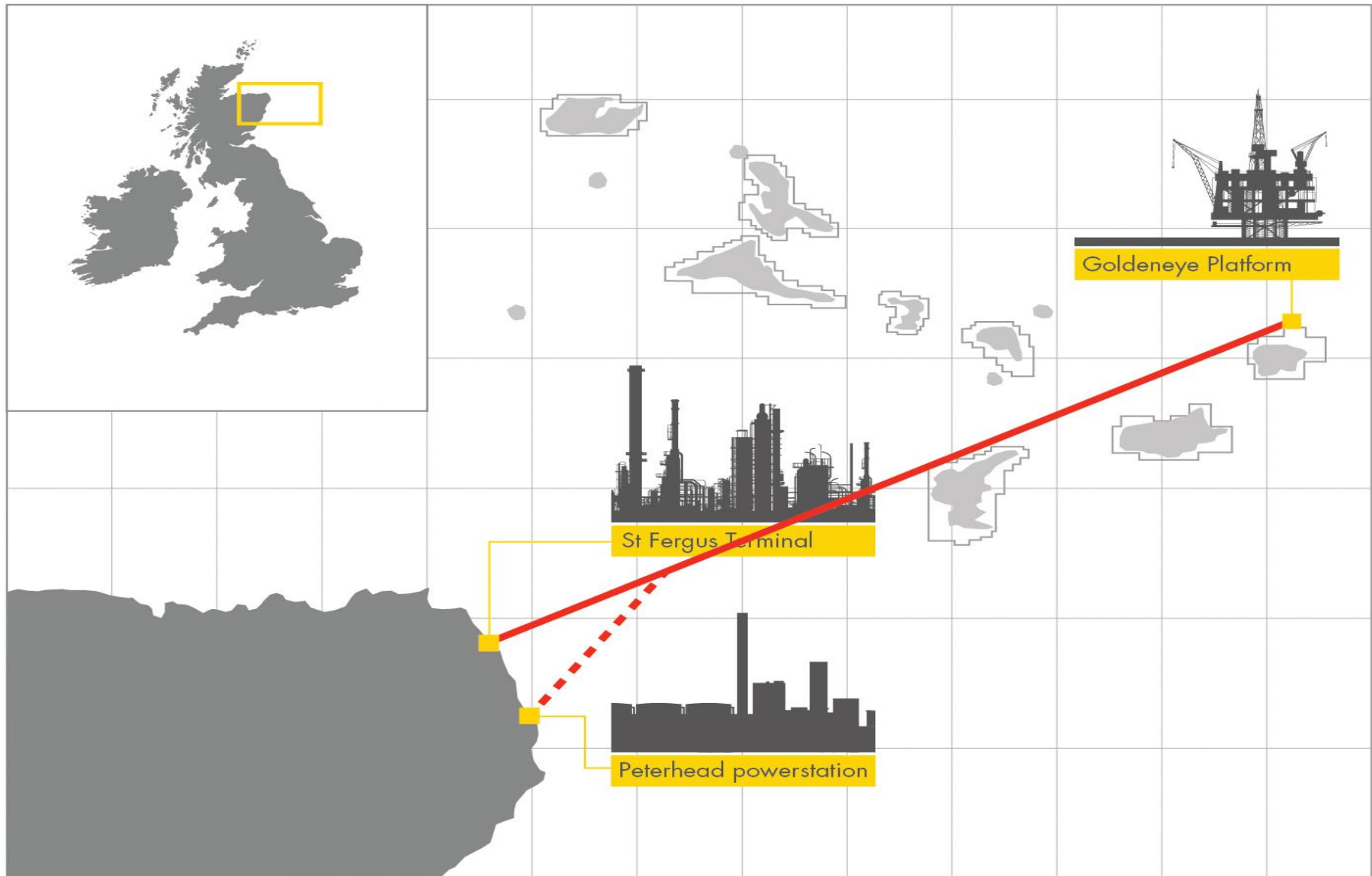


PETERHEAD SUMMARY

- **WORLD FIRST** – If momentum is maintained, first full-scale CCS project on a gas-based power station
- **LOCATION** – capture at Peterhead Power Station by the beach; storage in depleted Goldeneye gas reservoir 60miles offshore
- **IMPACT** –CO₂ emissions from 400MW turbine reduced by 90% to produce clean electricity from gas
- **CAPTURE TECHNOLOGY** – established, post-combustion capture using amines
- **TIME** – operational end of the decade



OVERVIEW OF THE PETERHEAD CCS PROJECT



A GREAT LOCATION

Capture at Peterhead:

- Existing gas turbine, grid connection, utility capacity
- Existing available land
- Builds on SSE capability to adapt



Transport and Storage:

- Re-use existing pipeline infrastructure
- Re-use existing platform (Goldeneye)
- Re-use the 5 existing wells
- Goldeneye reservoir is well studied; good candidate for storage of CO₂



SHELL PORTFOLIO, GAINING MOMENTUM

1. Tomatoes, NL



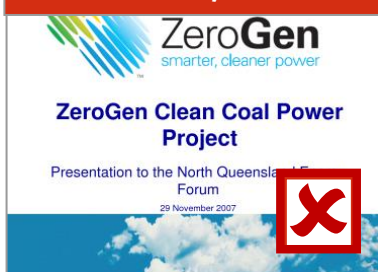
2. Barendrecht, NL



3. Draugen, Norway



4. ZeroGen, Australia



5. Longannet, UK



6. Gorgon, Australia



7. TCM, Norway



8. Quest, Canada



9. Peterhead, UK



Planning to enter FEED

✓ Shell is the capture technology provider for Boundary Dam, Canada

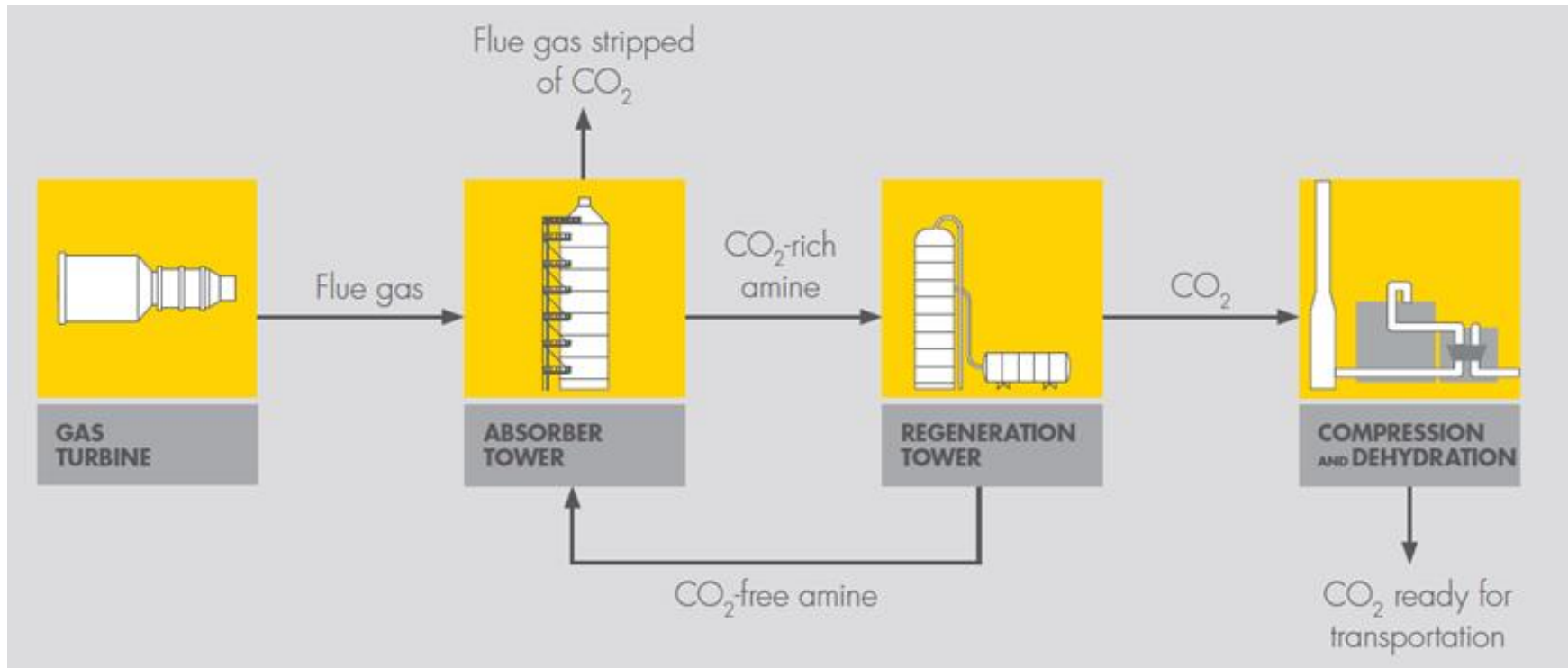
Simple as 1,2,3

**FROM PETERHEAD TO GOLDENEYE:
CAPTURE, TRANSPORT AND STORAGE**

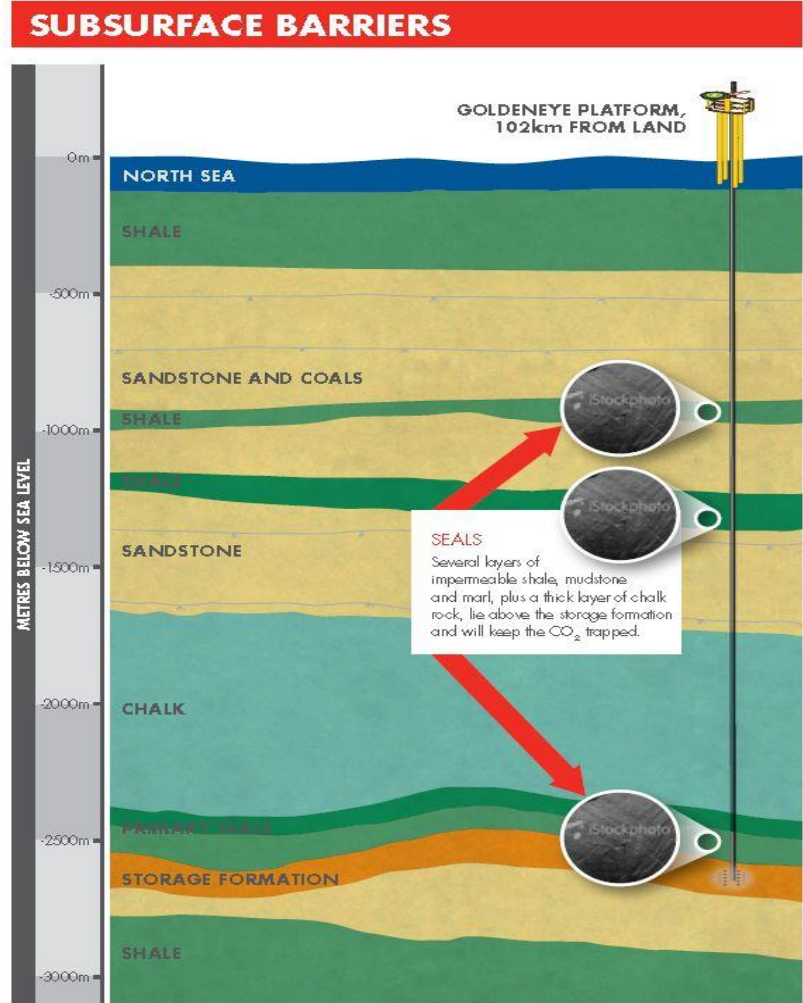
CAPTURING CO₂ FROM PETERHEAD POWER STATION



THE CAPTURE PROCESS

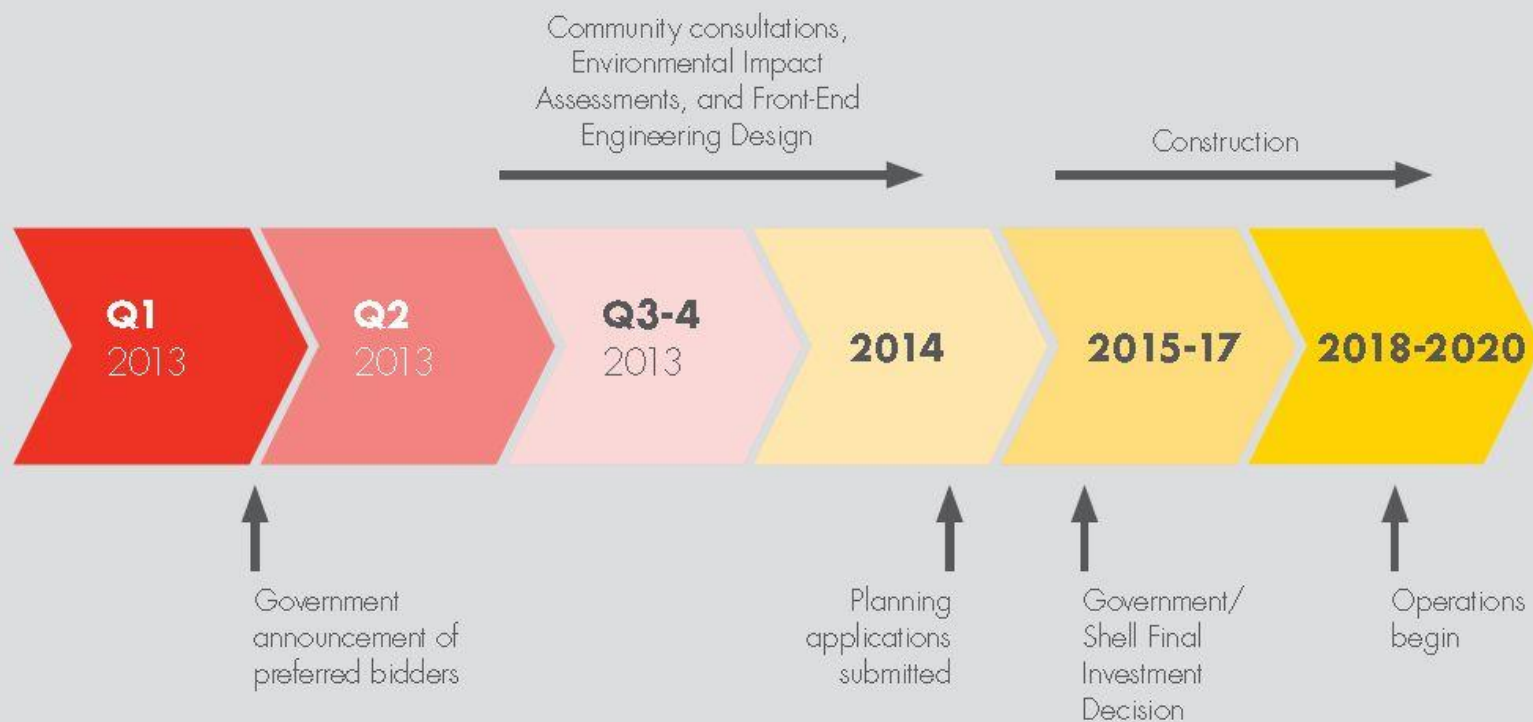


STORING CO₂ SAFELY BENEATH THE NORTH SEA



TIMELINE & NEXT STEPS

ANTICIPATED TIMELINE



THE PETERHEAD LEGACY

CONTRIBUTING TO THE LEARNING CURVE

TRANSPORT & STORAGE

- Achieve optimal scale in transport & storage sites
- Improved 'characterisation' of storage sites (capacity, location, injectivity etc)
- Regulatory framework & funding mechanism (licence, liabilities, 3rd Party access etc)

IMPROVED FINANCEABILITY

- Peterhead CCS will be self funded . But by doing one project, it de-risks the CCS chain for future financing
- We are part of the Ensure funding mechanisms are fit for purpose
- Continued involvement from financial & insurance sectors

ENGINEERING DESIGNS & PERFORMANCE

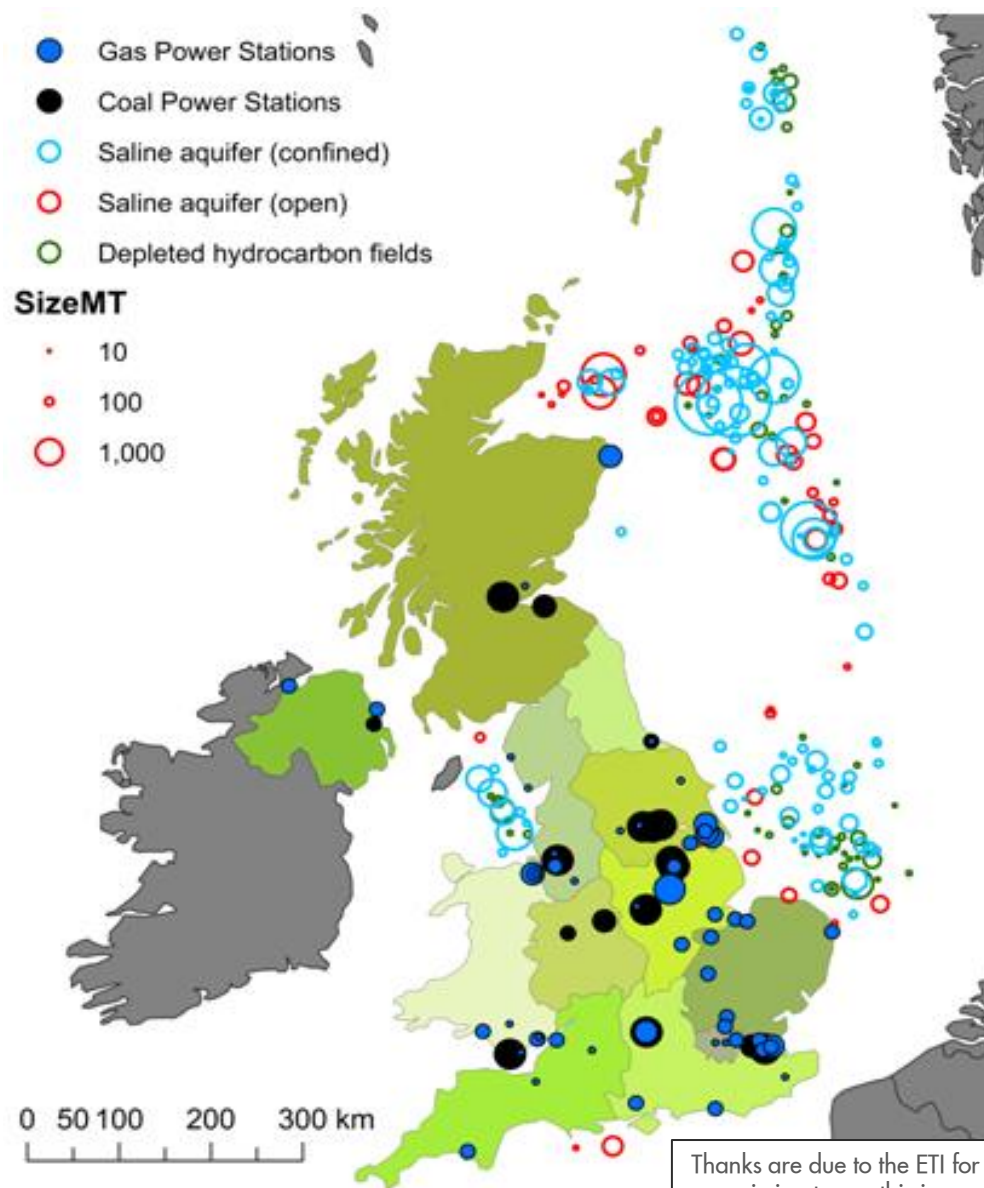
- Evolution of current capture technologies
- Next generation capture technologies
- Optimisation from early design
- Optimal scale of generation & capture unit size
- Developing the CCS supply chain

BRINGING BENEFITS & CREATING OPPORTUNITIES

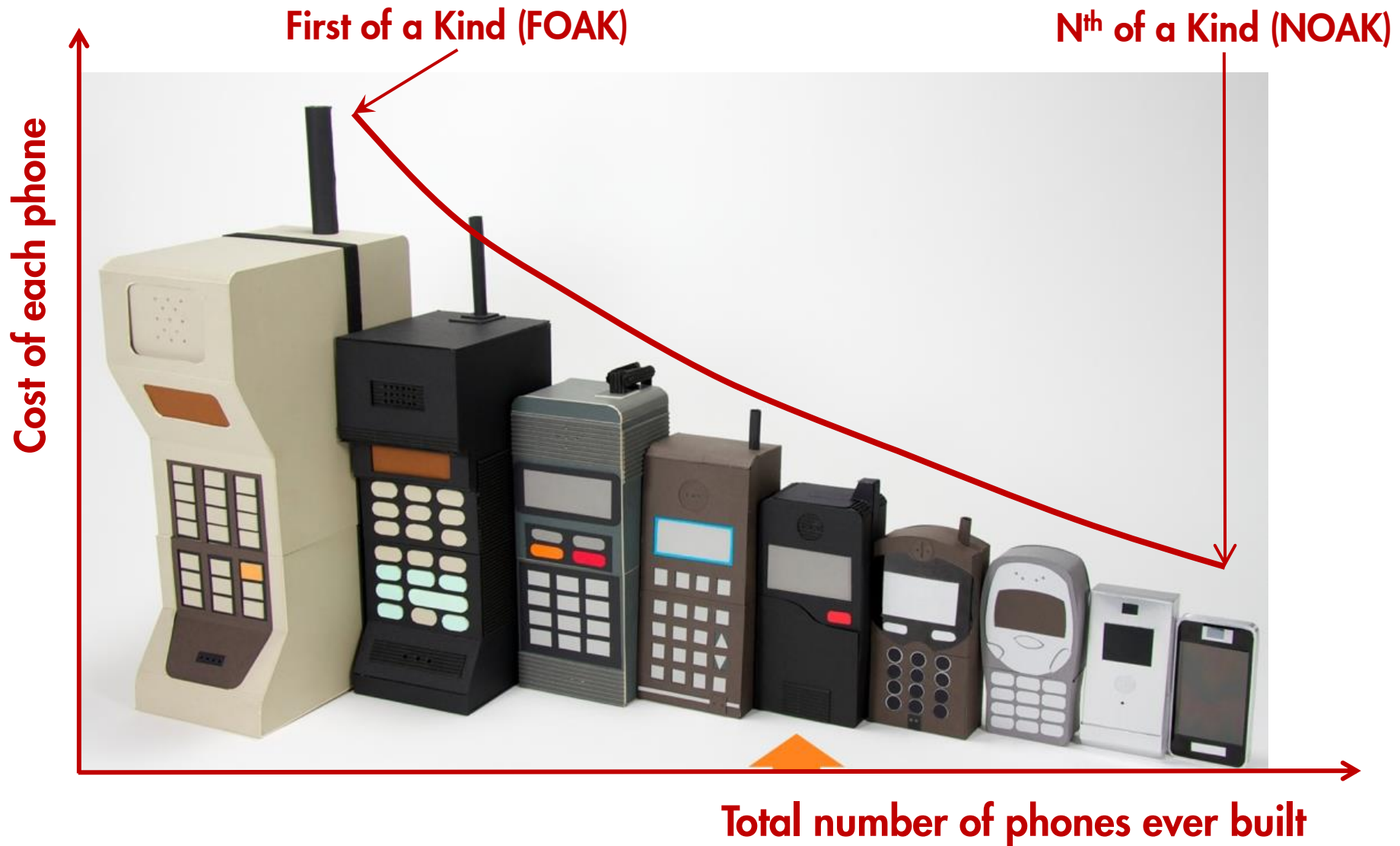


CCS WILL ATTRACT
INVESTMENT TO SCOTLAND
AND THE UK, AND BRING
FURTHER OPPORTUNITIES
FOR **JOB CREATION**, SKILLS
DEVELOPMENT AND THE
SUPPLY CHAIN. ”

DAVID RENNIE
DIRECTOR OIL AND GAS, THERMAL GENERATION
AND CCS, SCOTTISH ENTERPRISE



SLIDING DOWN THE COST CURVE



SAFE PASSAGE: EXPANDING THE CCS FAMILY . . .



