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Moving faster CCJournal London 8 Oct2012

Capture Transport Storage Use

Climate
Acceleration
Value

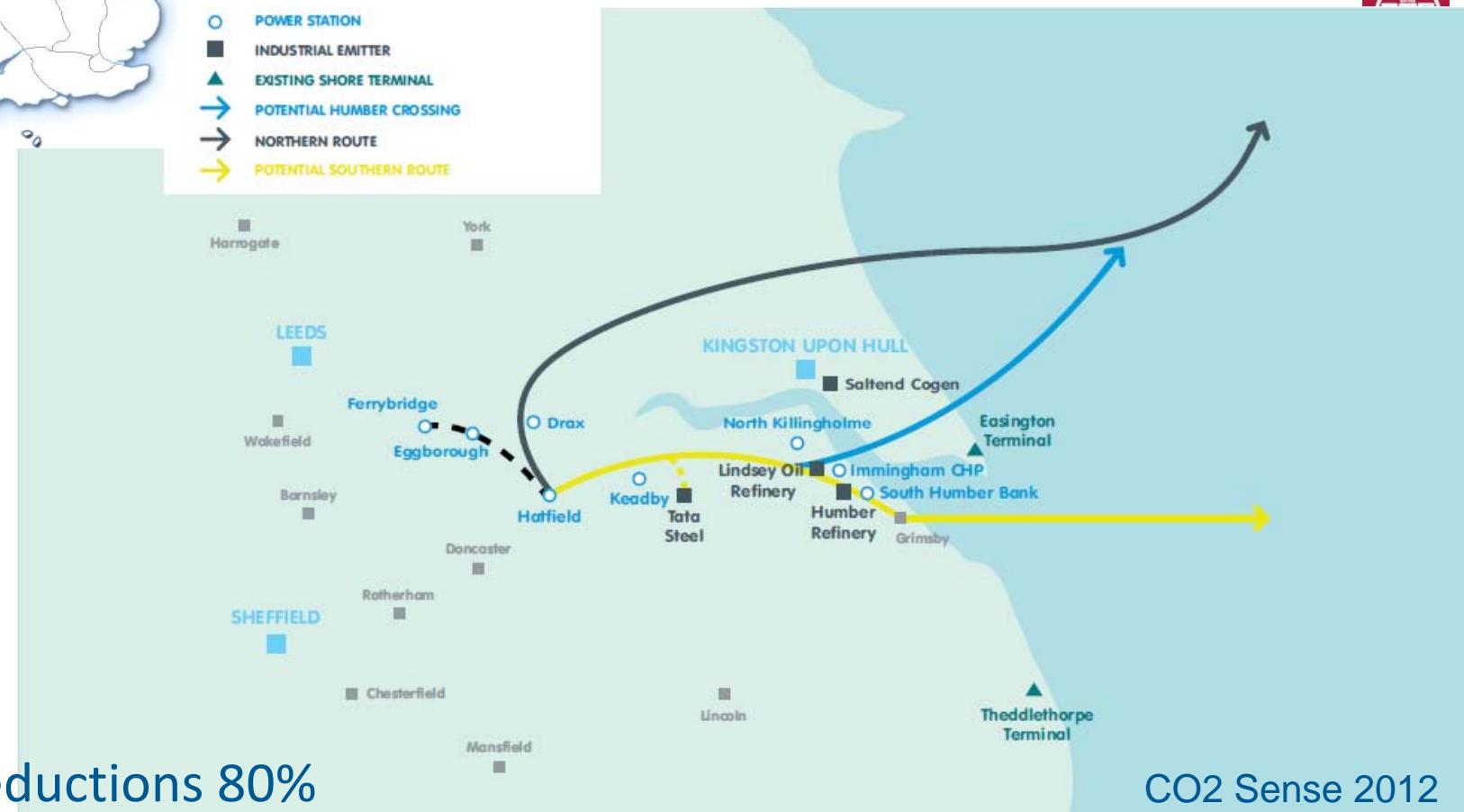
Stuart HASZELDINE
University of Edinburgh





www.sccs.org.uk

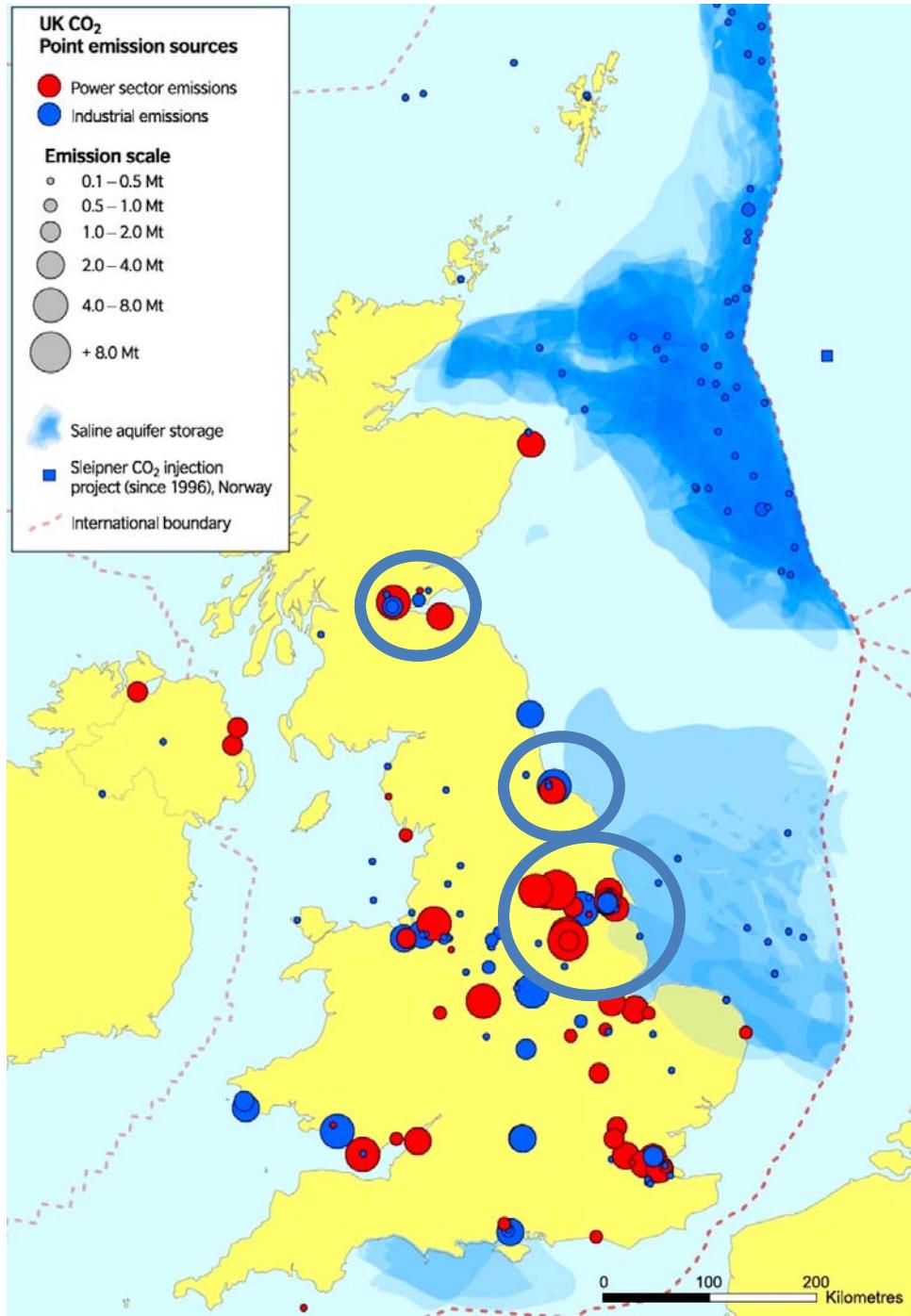
Yorkshire and Humber CCS Cluster



Shared pipeline : economy of gathering ONSHOREs

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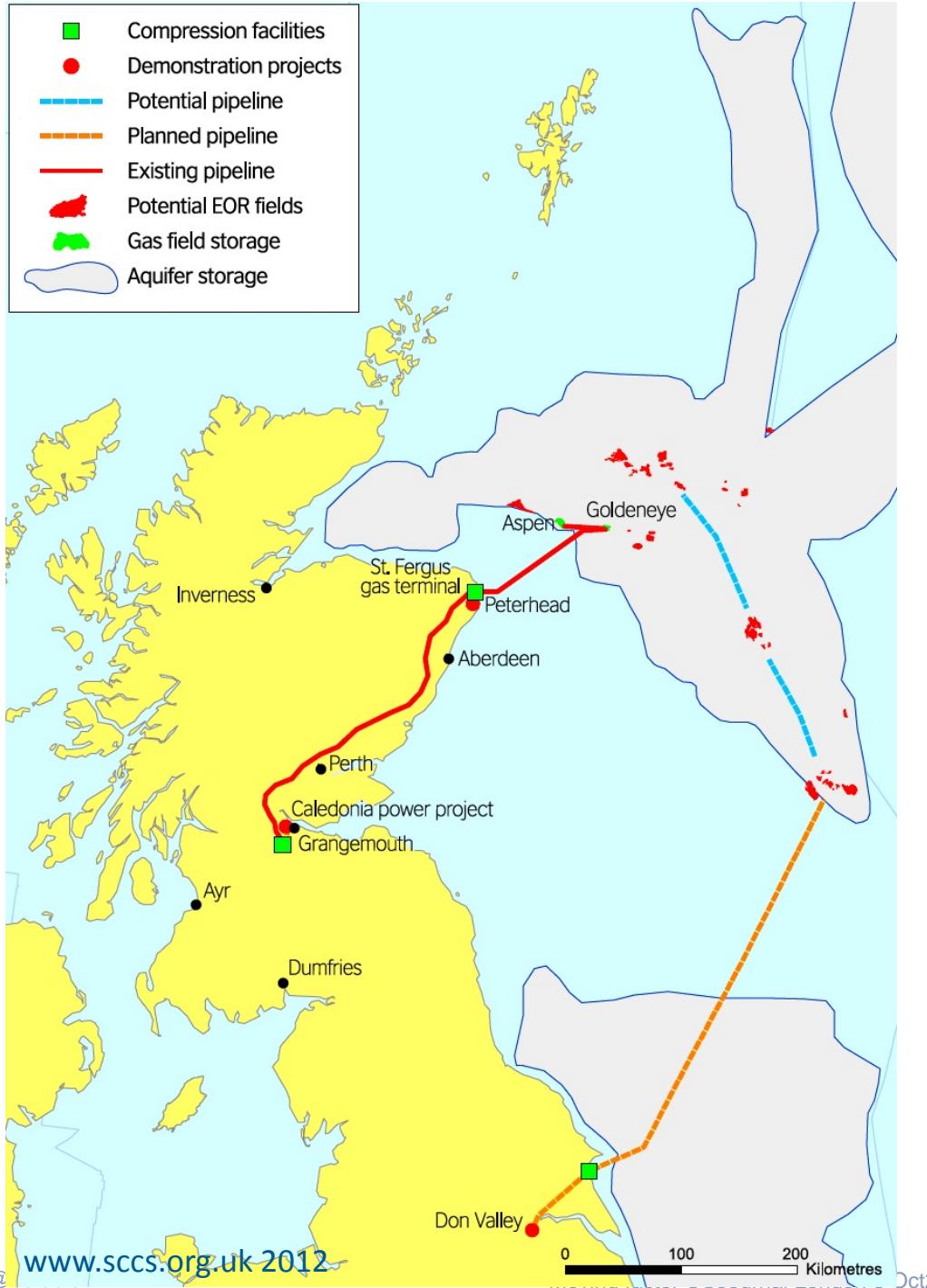
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Linking sources and storage



- Individual gas and oil fields easy first targets
- For scale-up to multiple 30 yr projects, need saline aquifers
- Multiple layers in CNS, NNS. Single layers SNS



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Transport first UK projects 2020



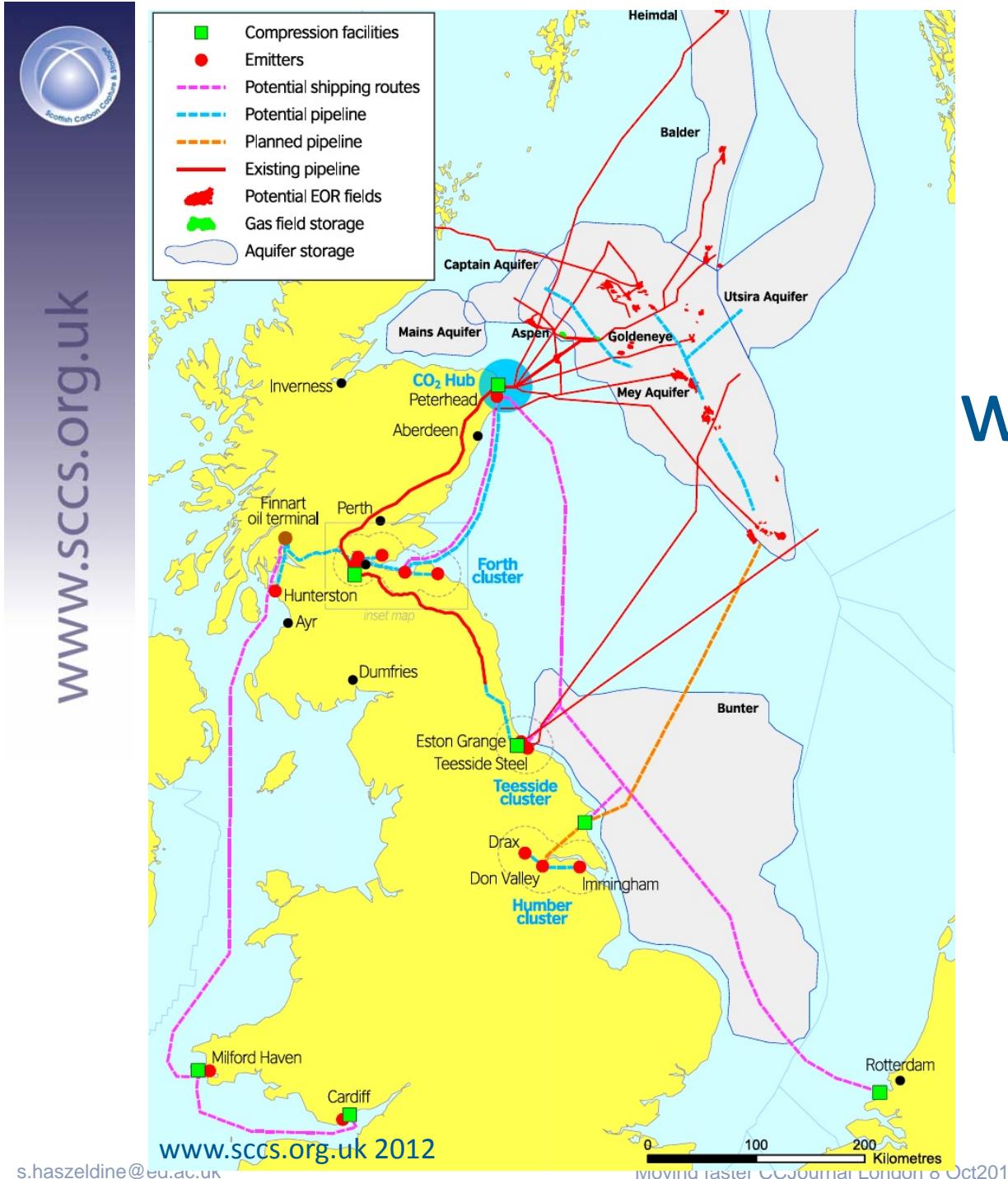
Single onshore emitters.

Feeding to offshore
reliable storage

Transport CCS gets to work 2030

Clusters of onshore
large emitters.

Feeding to offshore
clusters of storage



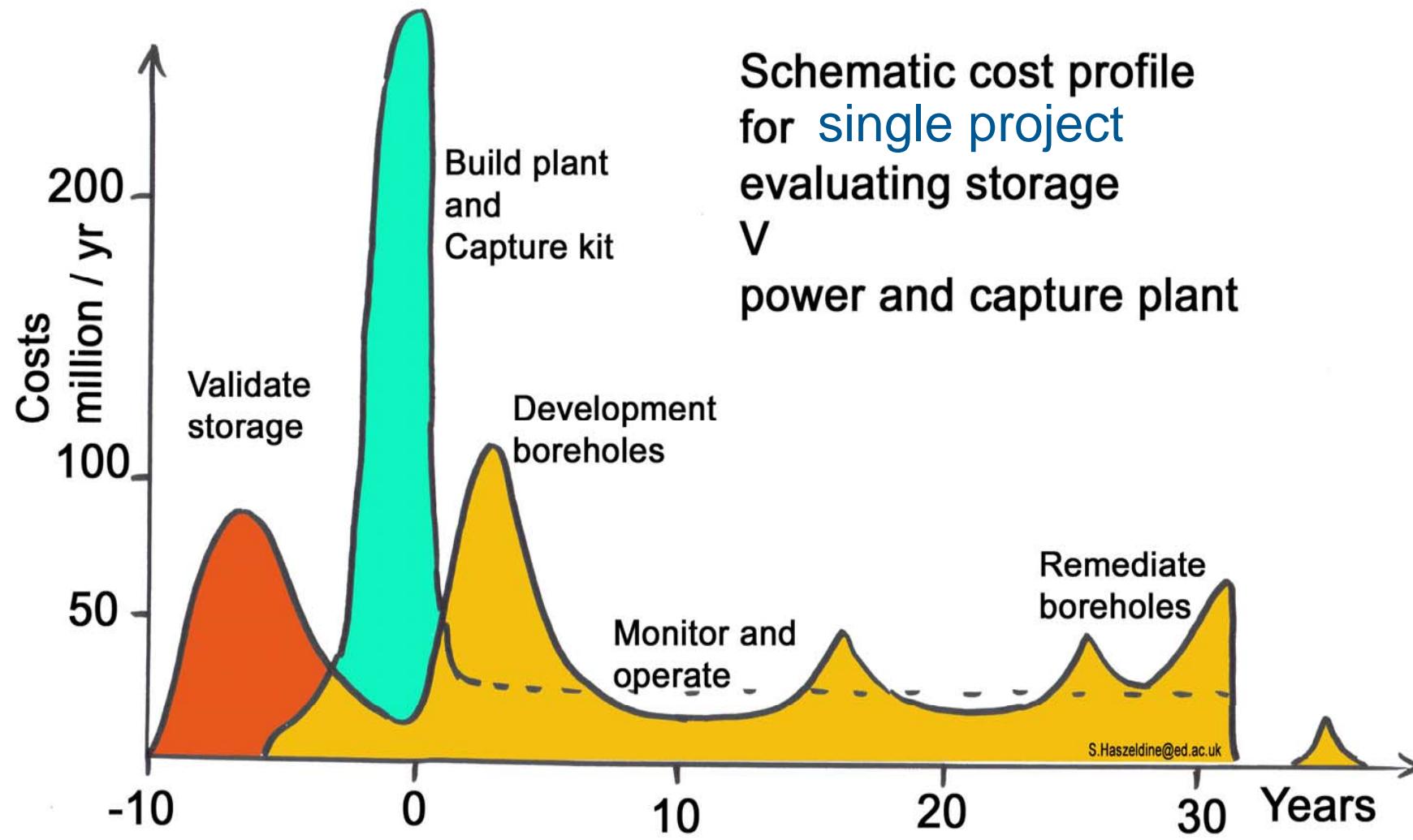
Shipping of CO₂



Storage testing Reduction of risk

- Testing storage,
- Before pipes
- Flexible
- Low cost for electricity
- Short and long term option
- UK has ports

Aquifer storage offshore: 10 yr ahead



Storage costs comparable to powerplant - but in advance

Haszeldine 2012 Energy and Environment vol 23

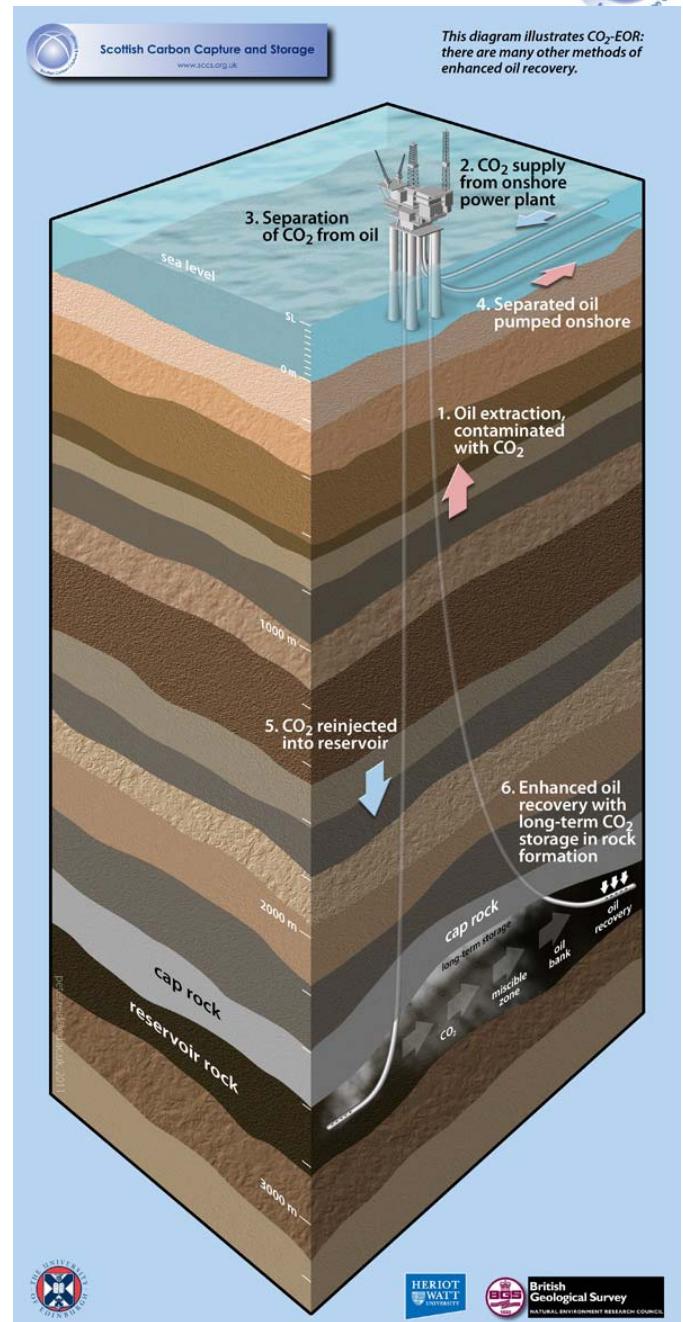
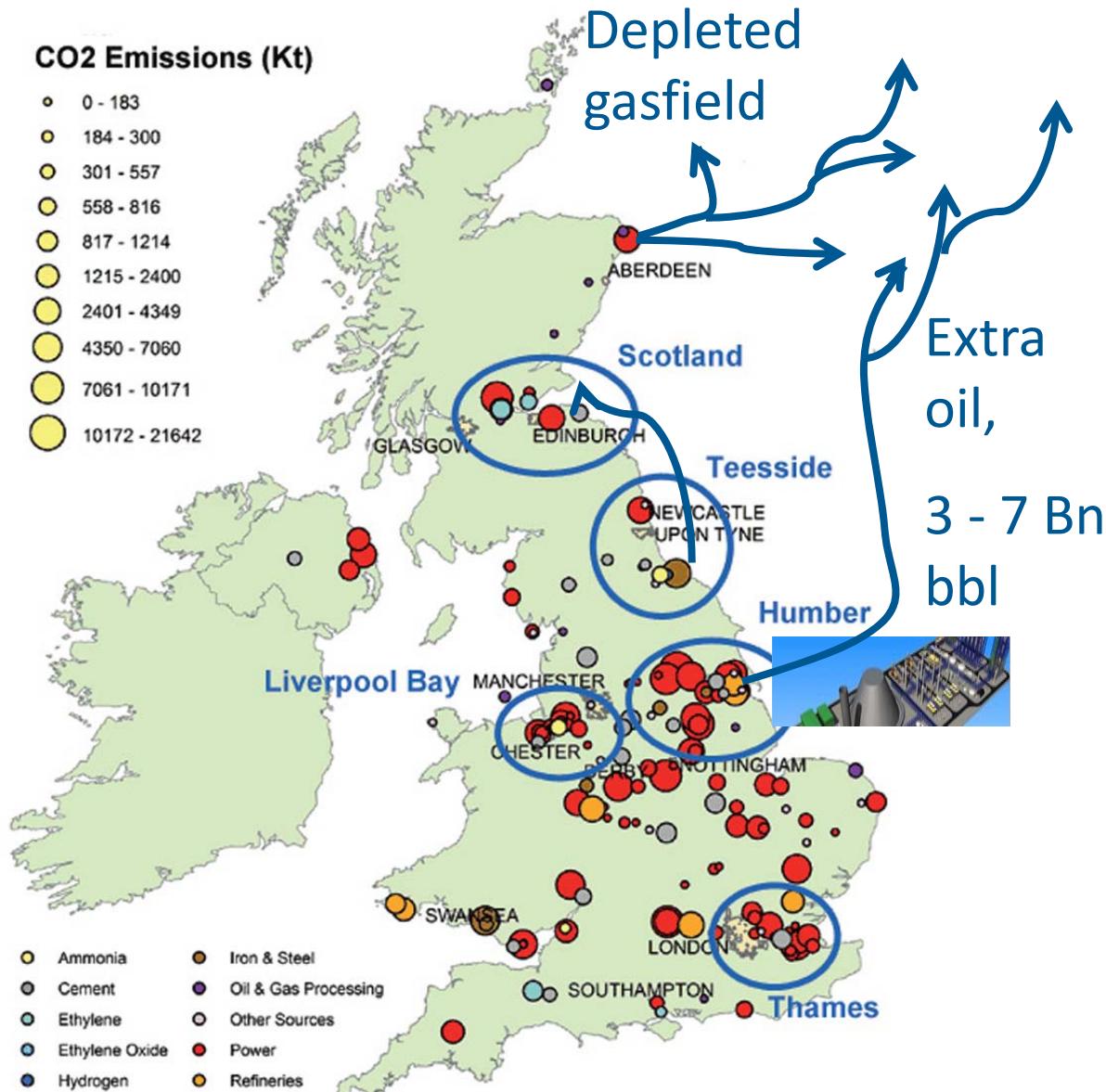


Product utilisation : CO₂-EOR



CO₂ Emissions (Kt)

- 0 - 183
- 184 - 300
- 301 - 557
- 558 - 816
- 817 - 1214
- 1215 - 2400
- 2401 - 4349
- 4350 - 7060
- 7061 - 10171
- 10172 - 21642





Summary

- First one (or three) projects
- Followed by a development pathway
- Multiple learning cycles in series
- Economies of scale in gathering
- Shipping as a flexible method to test storage
- Economies of scale in proving storage
- Utilisation of CO₂
- Multiple value products

**Multiple clusters
Building future infrastructure
Maintaining and extending jobs**