

# Vattenfall CCS Validation and Implementation

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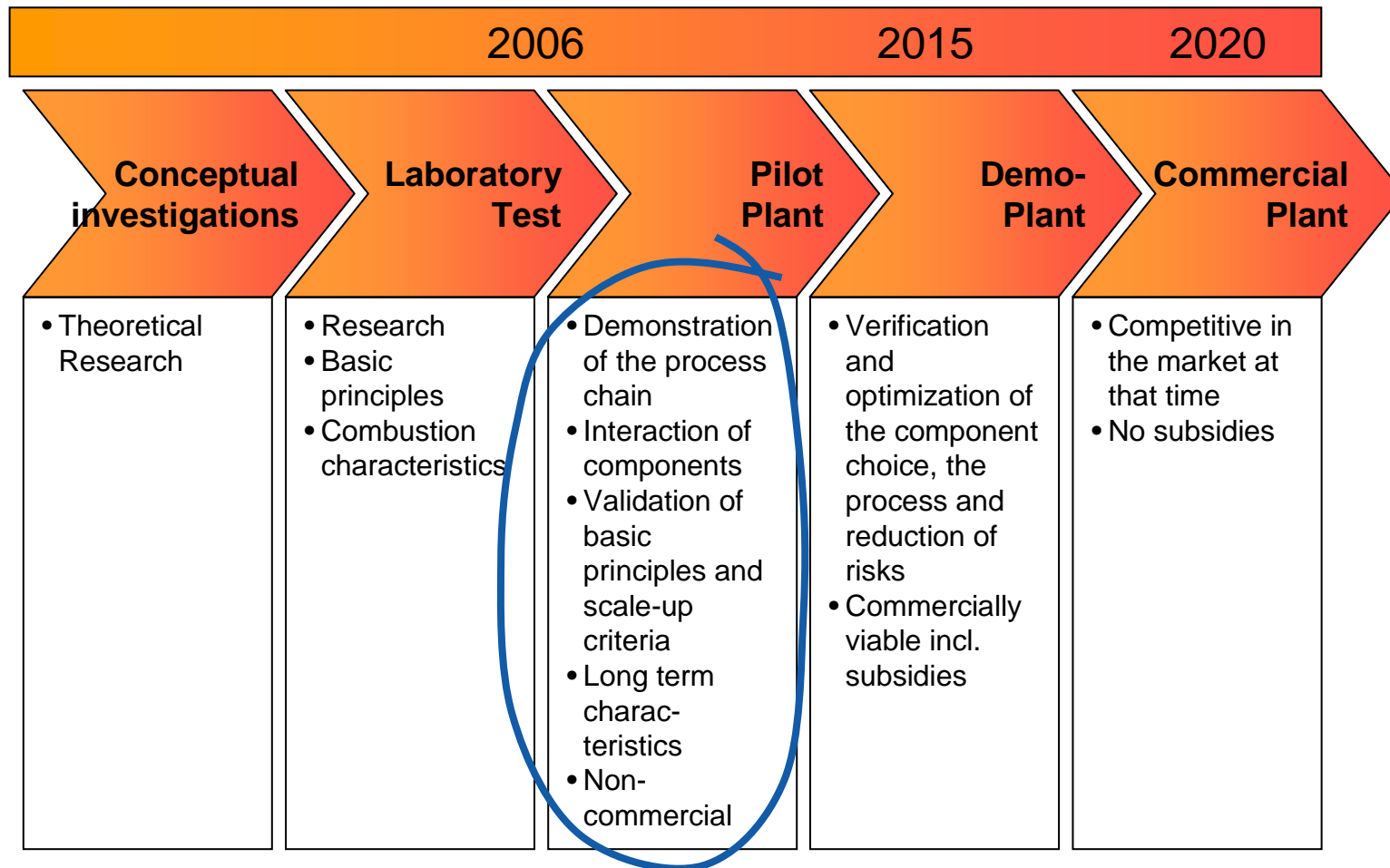
Vattenfall Research & Development AB

Stockholm/Älvkarleby/Berlin

# The Vattenfall Group

- Vattenfall is one of the major Energy companies in Europe
- Vattenfall sells almost 200 TWh electricity
  - The main part is produced by hydropower, nuclear power, coal and natural gas.
  - A smaller part is produced by bio fuels and wind power
  - About 20 TWh is produced in combined heat and power plants
- Vattenfall also sell about 40 TWh heat
  - The main part is produced by bio fuels, coal and gas in cogeneration plants
- Vattenfall emits about 90 million tons of CO<sub>2</sub> per annum

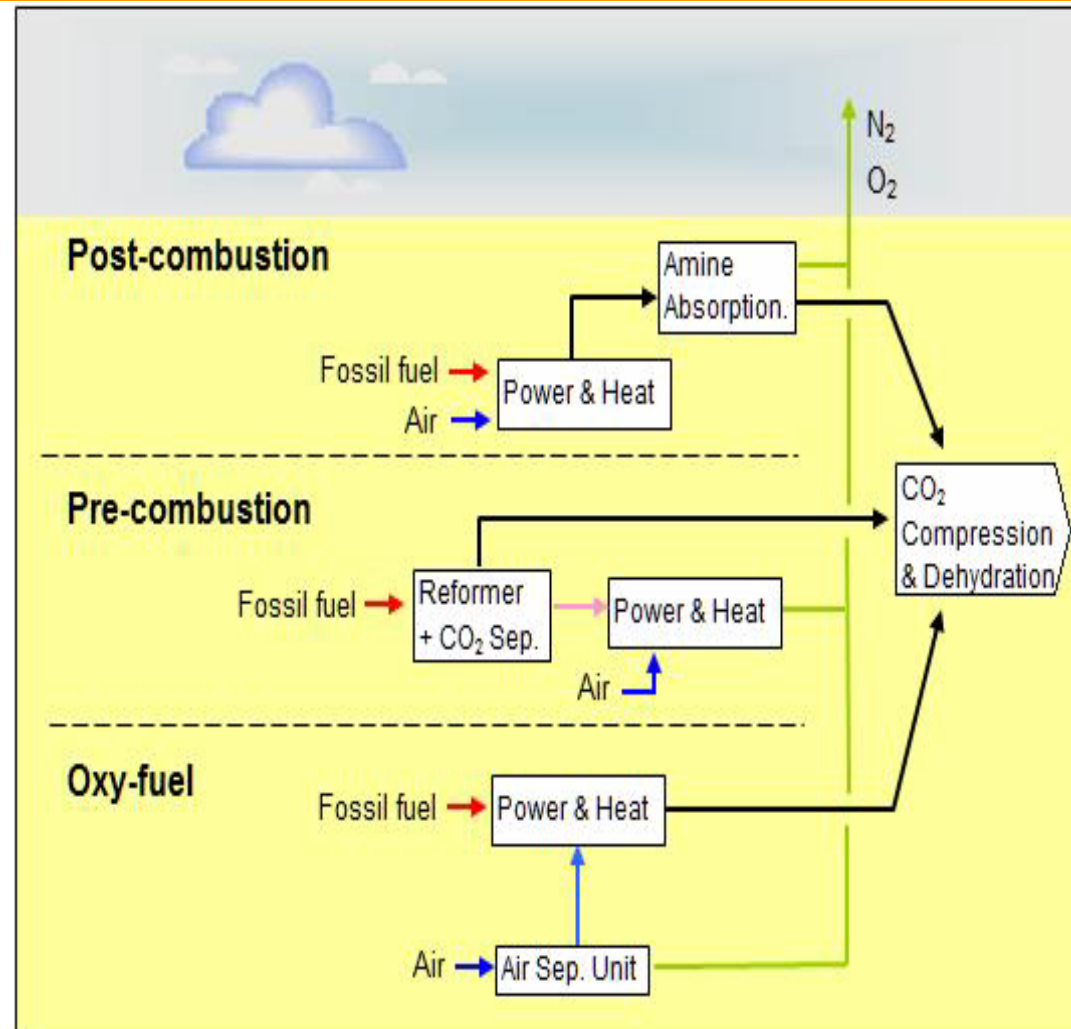
# Roadmap to realization of CCS



# Capture Technology Options

Three technologies seems capable to fulfil the primary target to 2020. No “new” technology can do that.

- All three largely contain known technology and components
- All need optimisation, scale up and process integration

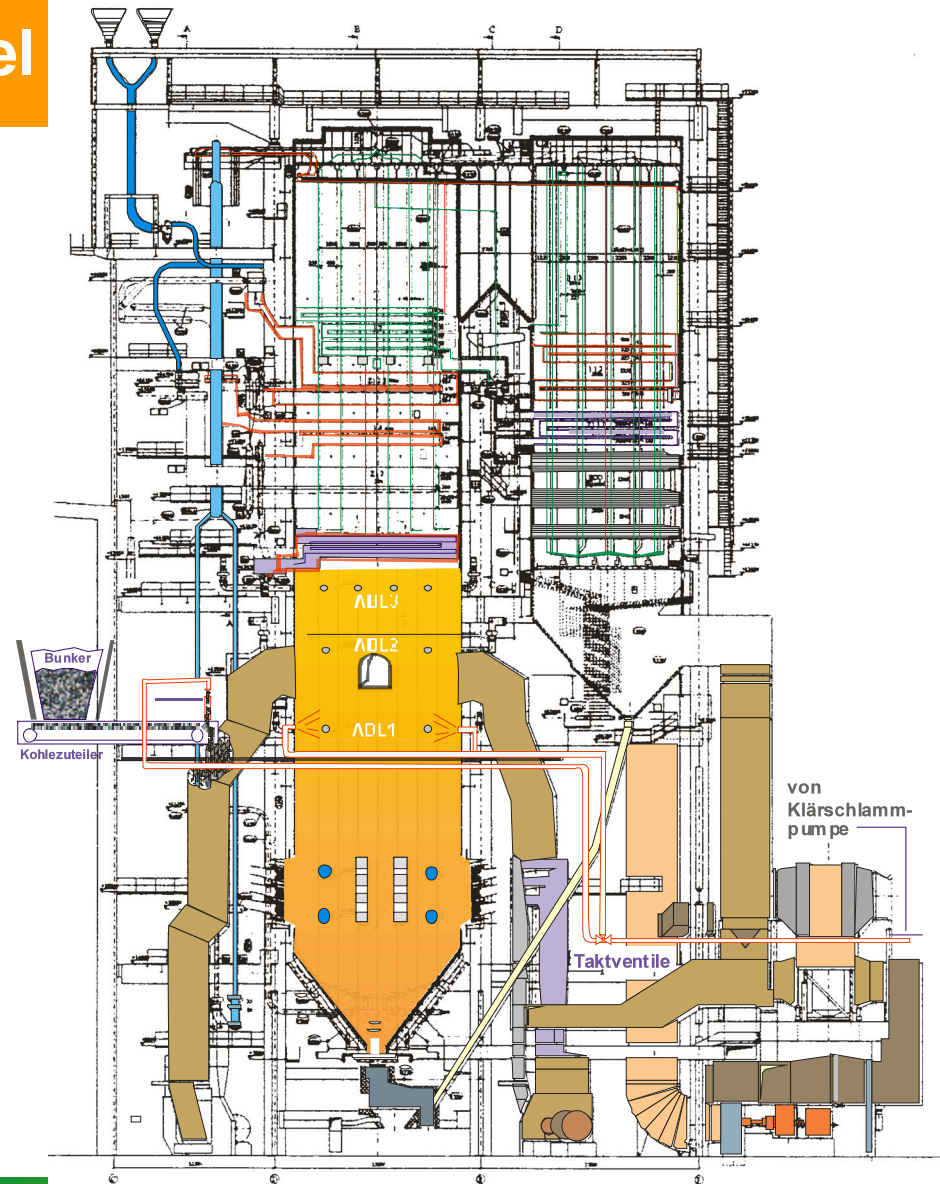


# Capture option: Oxyfuel

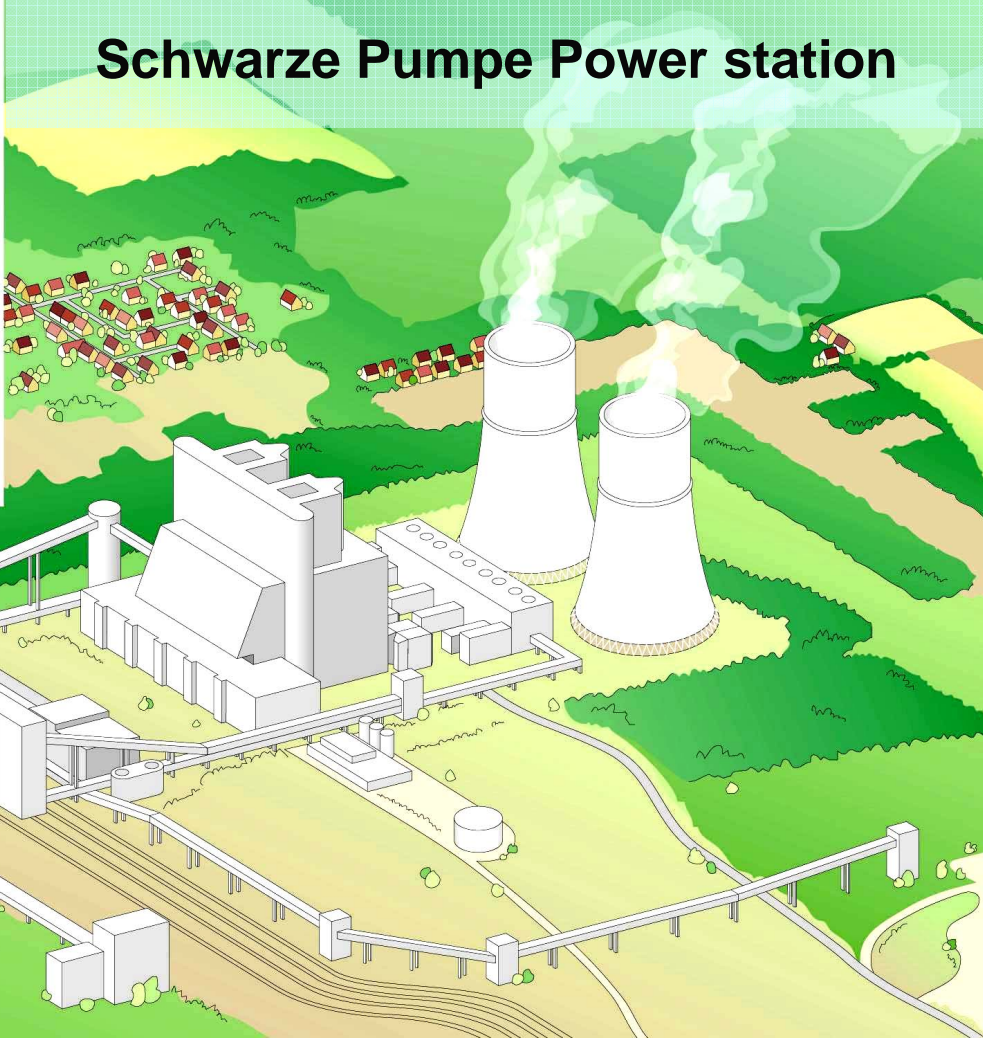
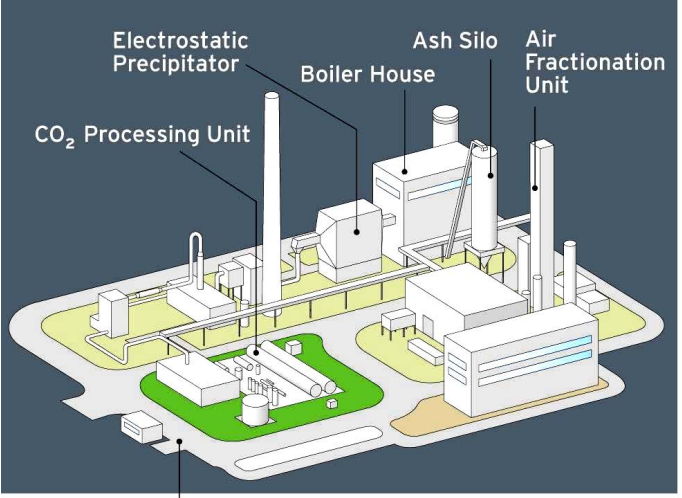
## Why Oxy-fuel technology ?

We work with all three (four) technologies, but:

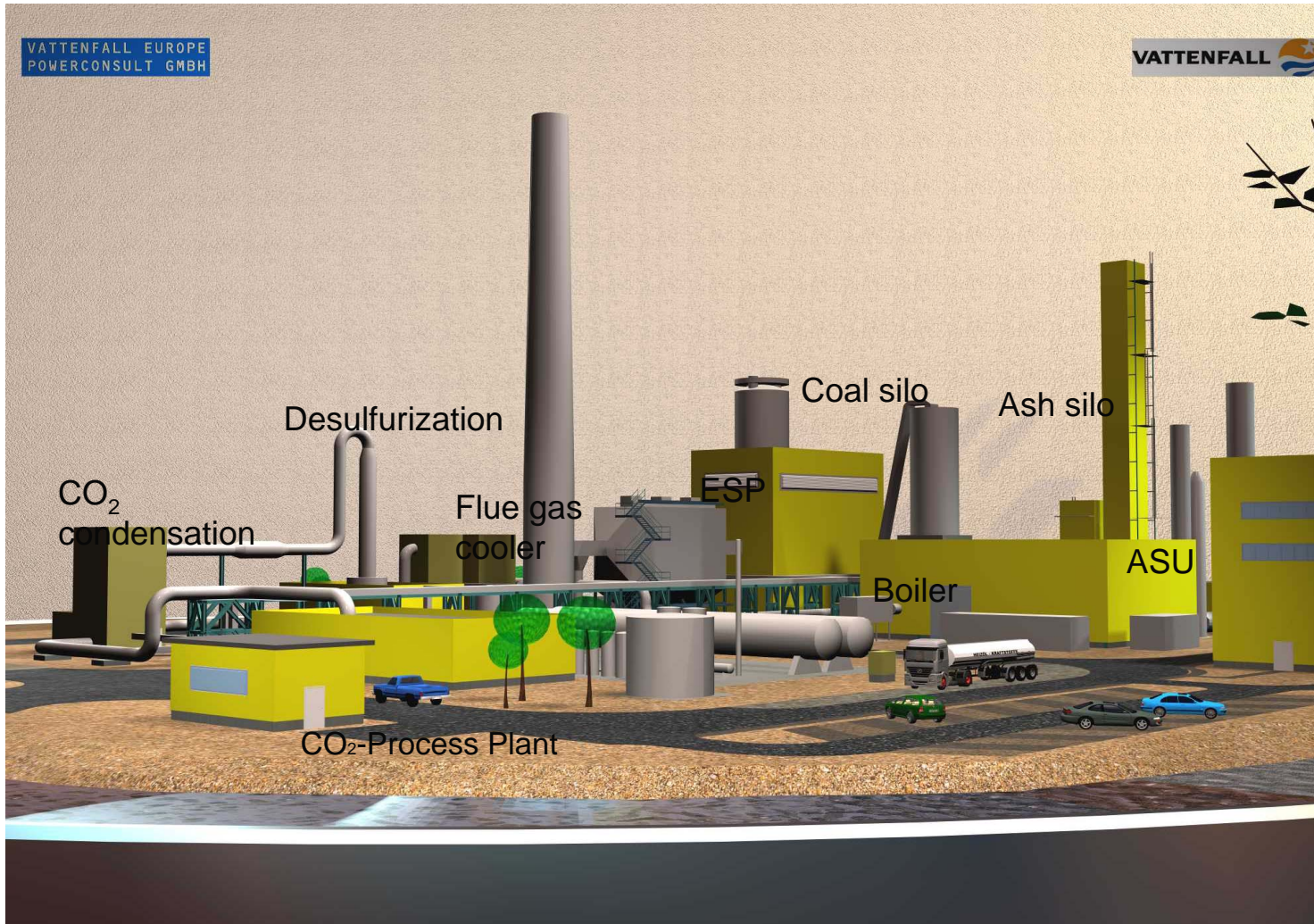
- Oxyfuel technology is the technology giving lowest costs at present
- It is suitable for coal and have relatively little development work left
- We can build on our good experience with present PF technology



# Location of the 30 MW Pilot plant

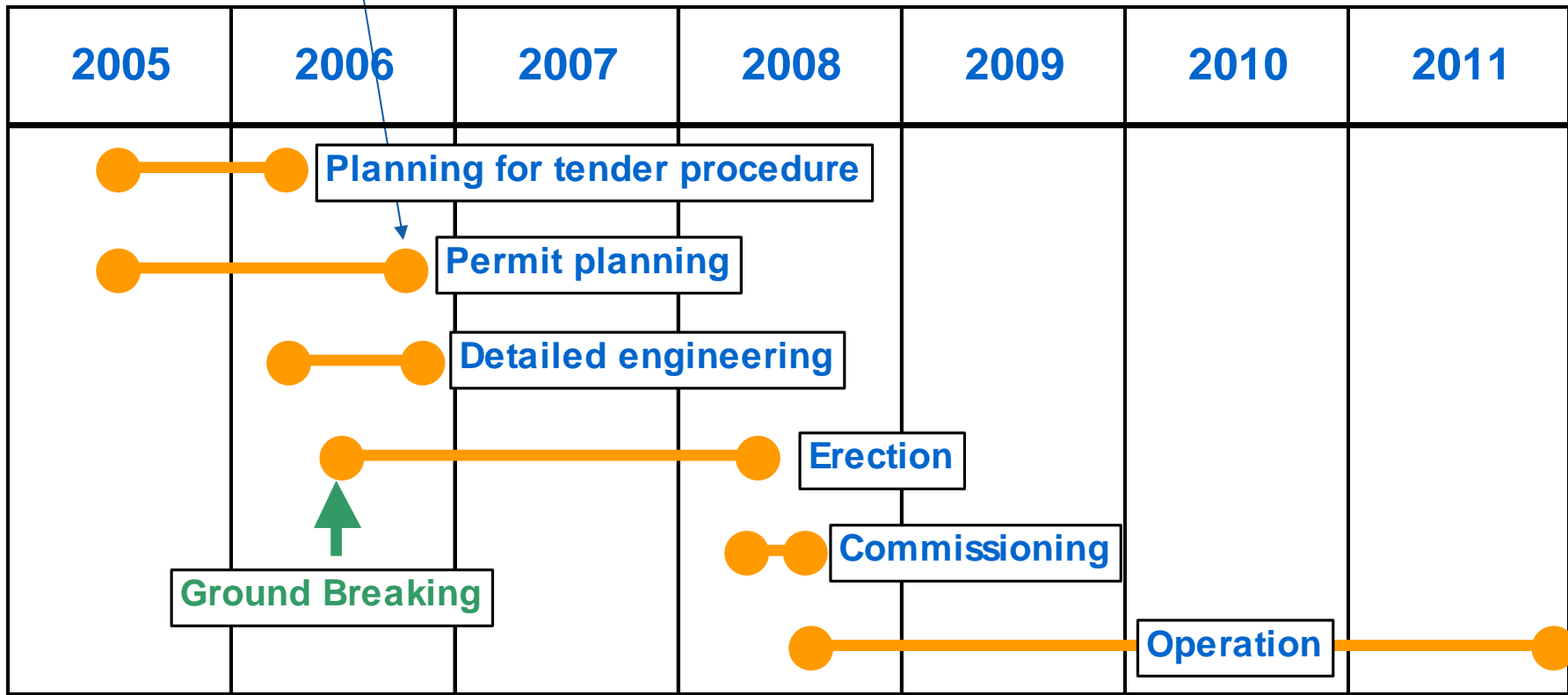


# Preliminary 30 MW Pilot Plant layout



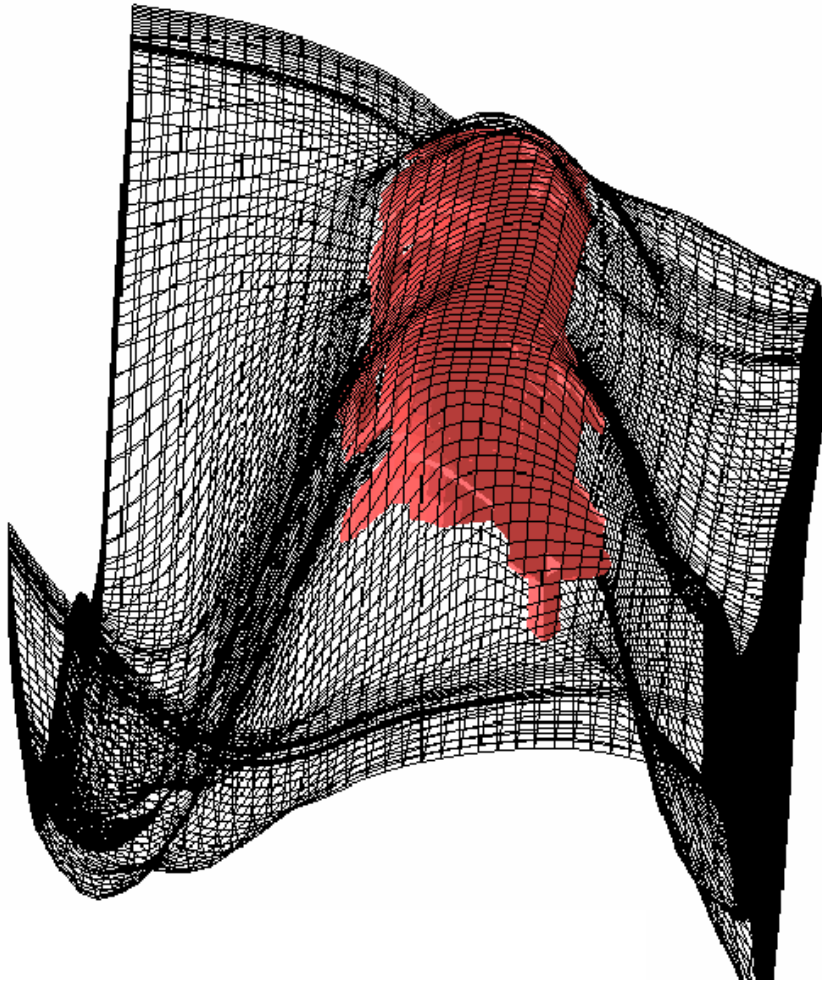
# Time Schedule – 30 MW pilot test facility

Permit achieved 21<sup>st</sup> Nov 2006



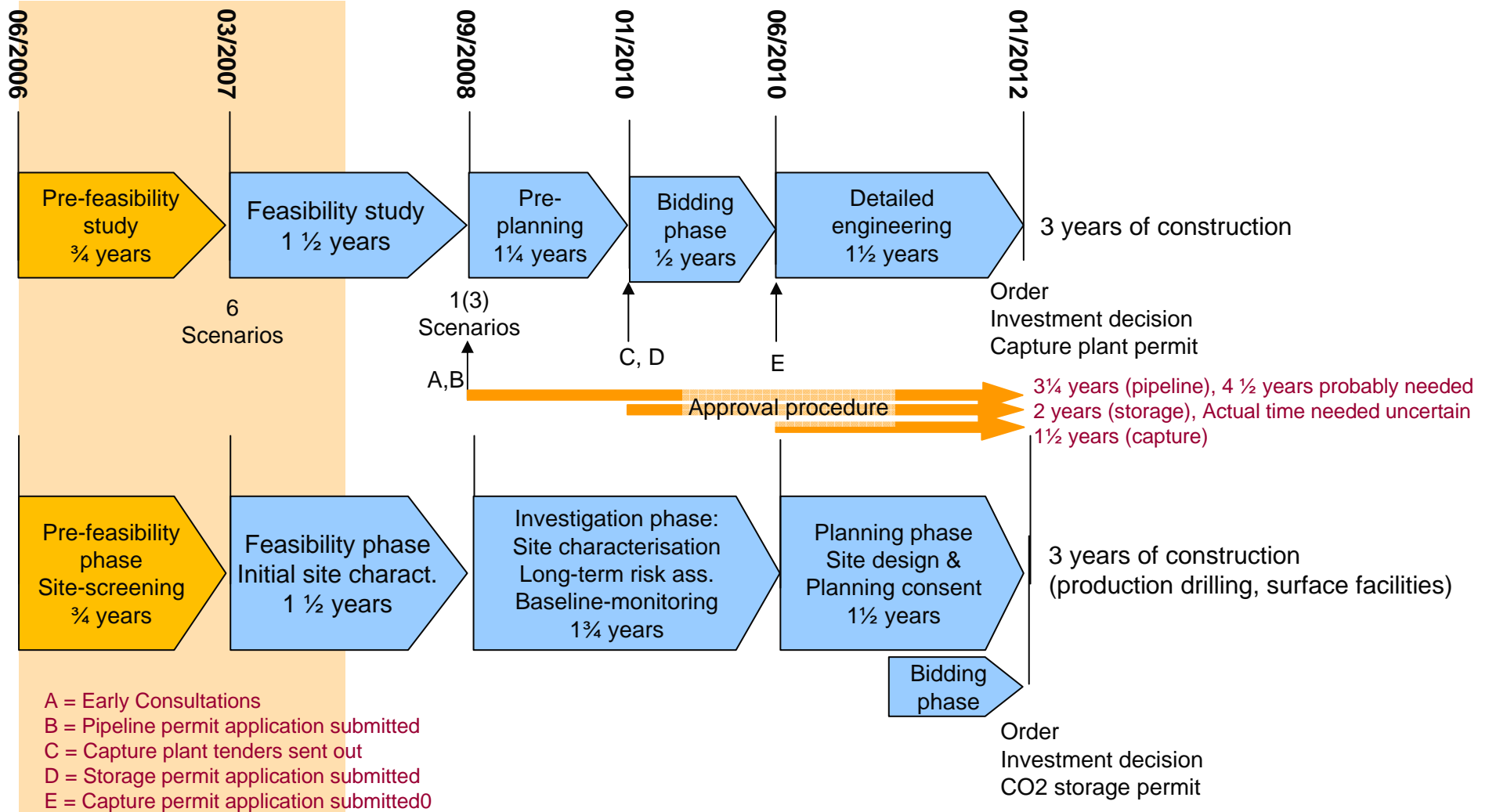


# CO2 Storage



- **The 30 MW test facility produces CO<sub>2</sub> of a very high quality**
  - It can be stored anywhere, or sold as a commercial product
  - It is a product, not a waste
- **Several pilot storage options are examined at present**
  - We anticipate to have a pilot storage ready, when considerable amounts of CO<sub>2</sub> start to be produced

# Time line – 300 MW Capture & Storage demonstration





END

Thank You for  
Your attention