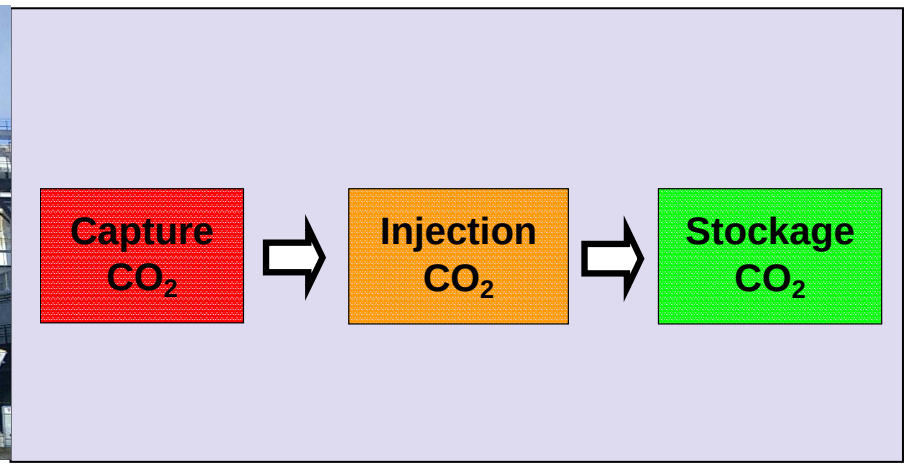
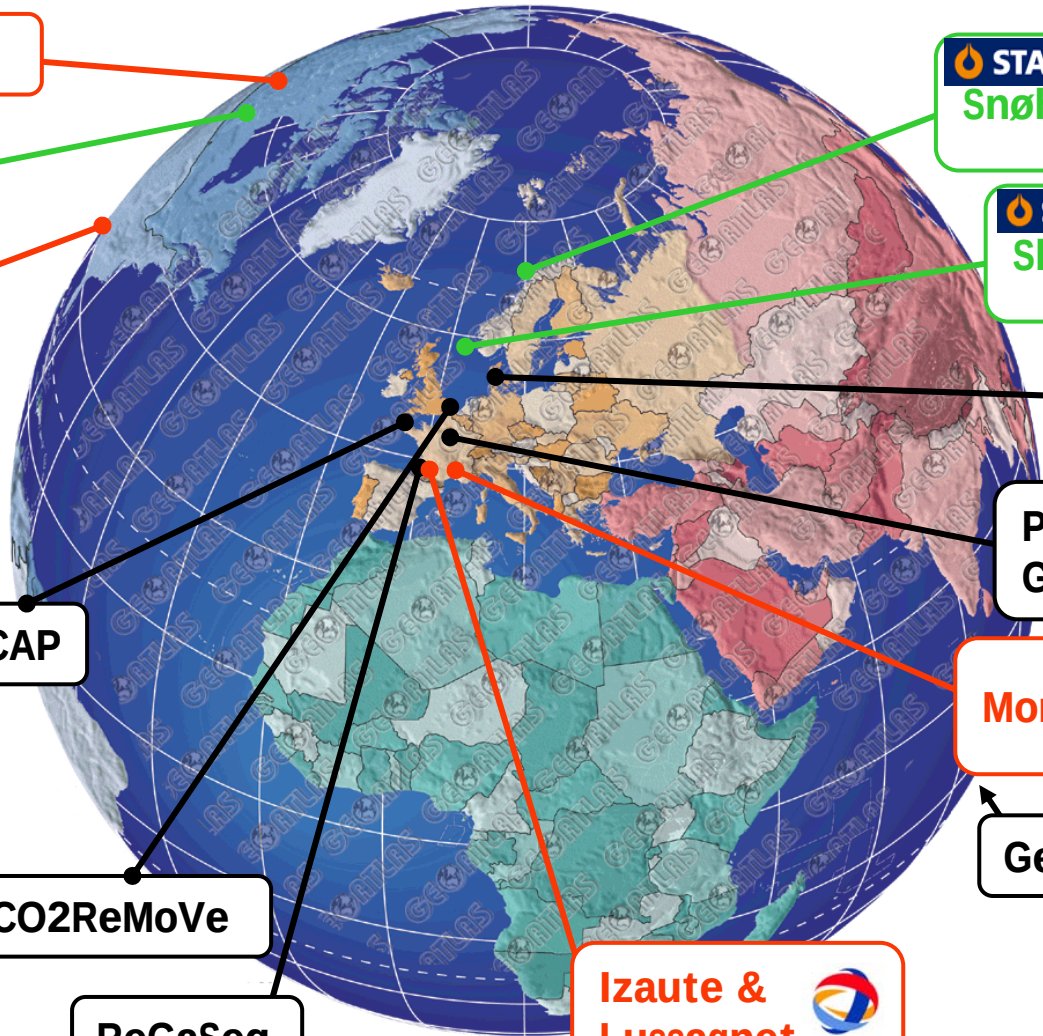


CO2 capture and storage – Lacq pilot project

September 2006

R&D connections : knowledge network



AGI Alberta

Weyburn

West Texas EOR

STATOIL Snøhvit

STATOIL Sleipner

CO2Store

Picoref Geocarbone

Montmiral

Geodisc

Izaute & Lussagnet

ReGaSeq

CO2ReMoVe

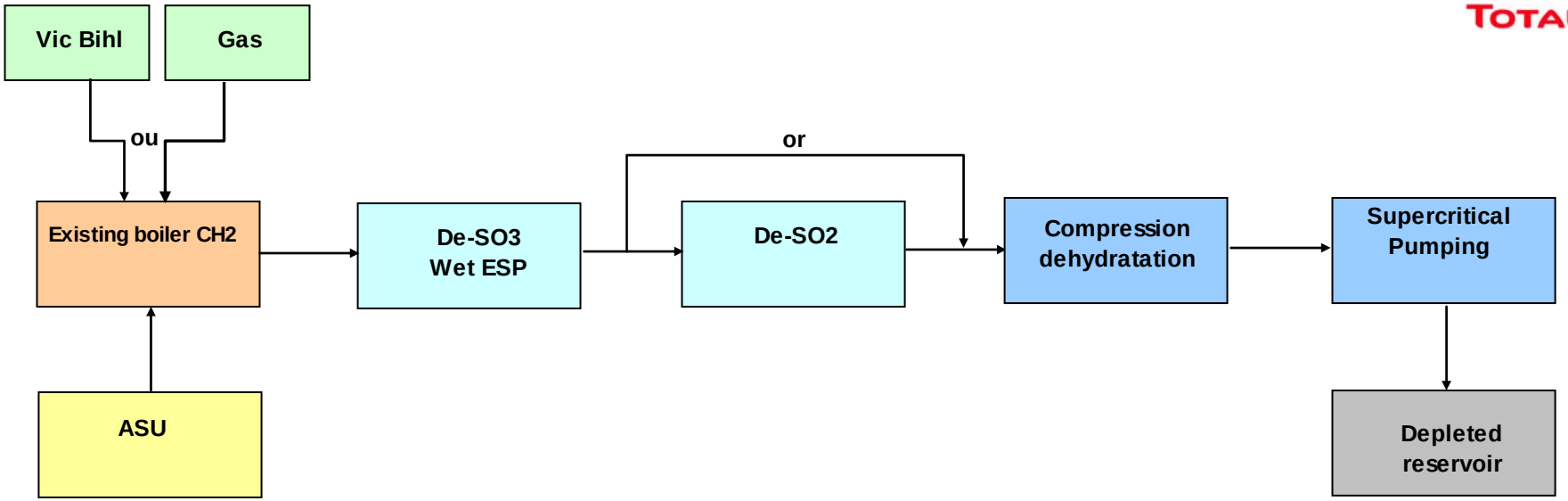
ENCAP

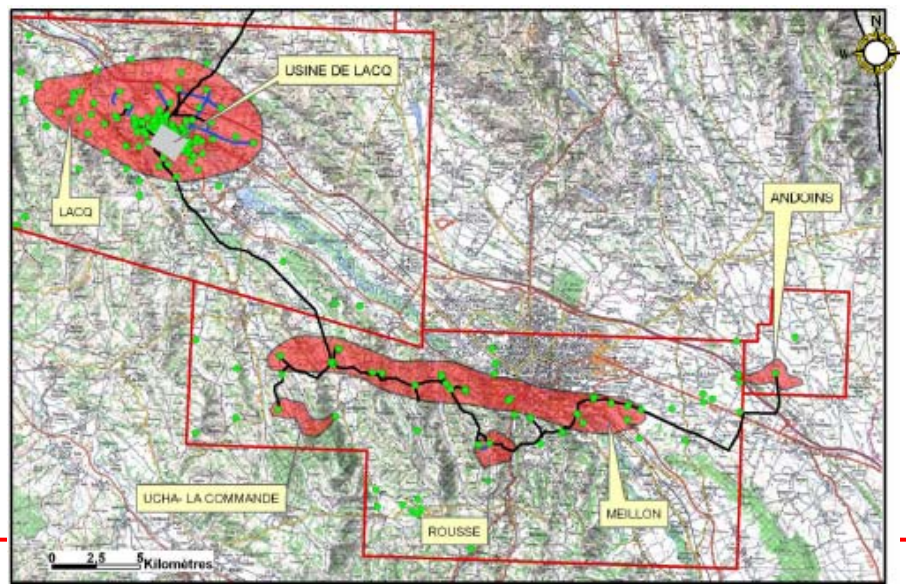
Feed back

Analogues

Science

Oxycombustion and CCS Lacq pilot to start in 2008

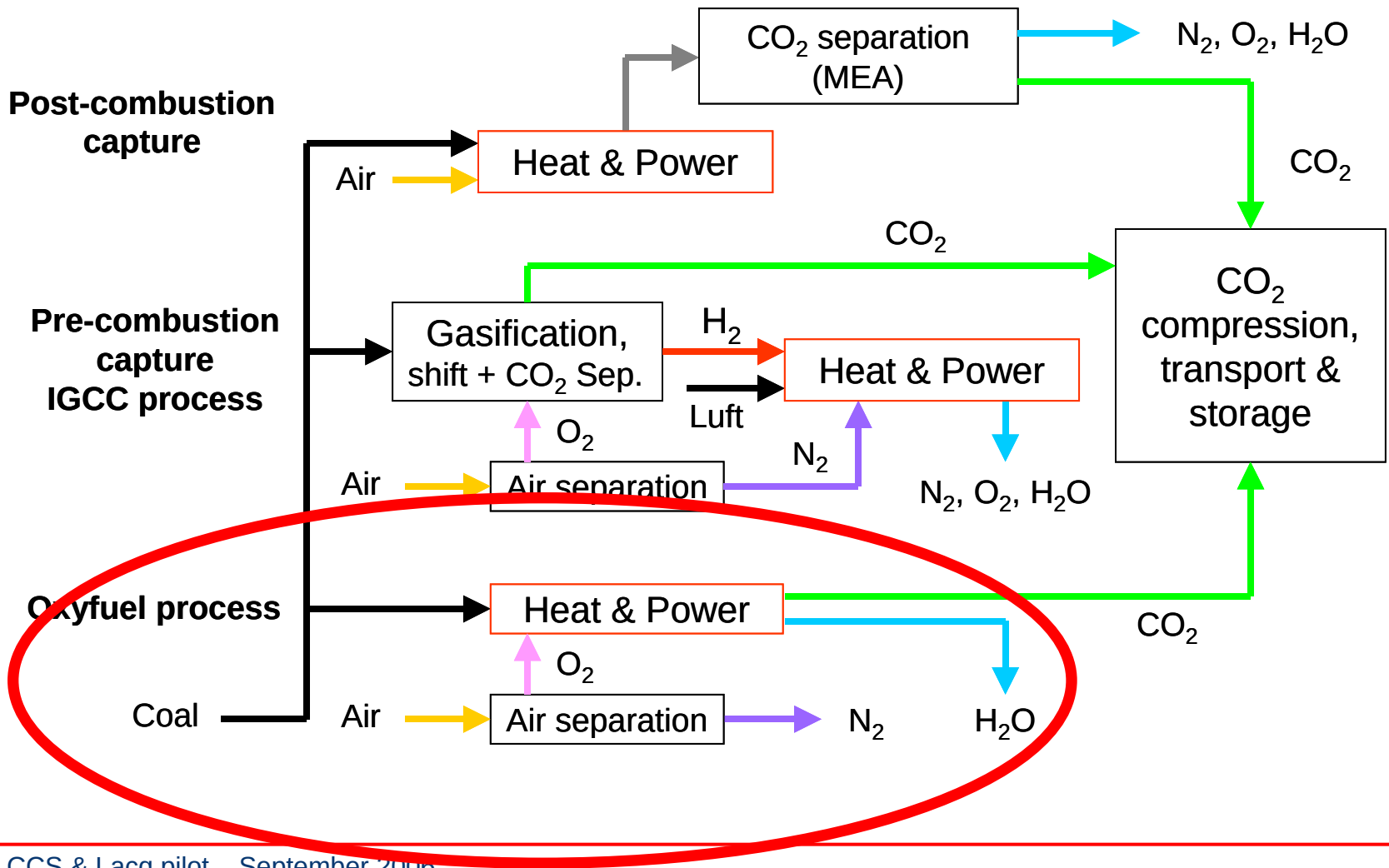




DEMONSTRATION UNIT

- Revamping of a conventional boiler
- 35MW oxycombustion with liquid fuel
- 40t/h of steam will be produced
- Different fuels will be tested
- Innovative flue gas treatment
- CO2 injection and transport to Lacq satellite
- CO2 storage in a depleted reservoir (75 kt/year during 2 years)

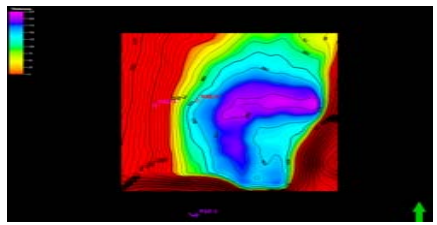
Oxycombustion as a CO2 capture option



Lacq pilot objectives

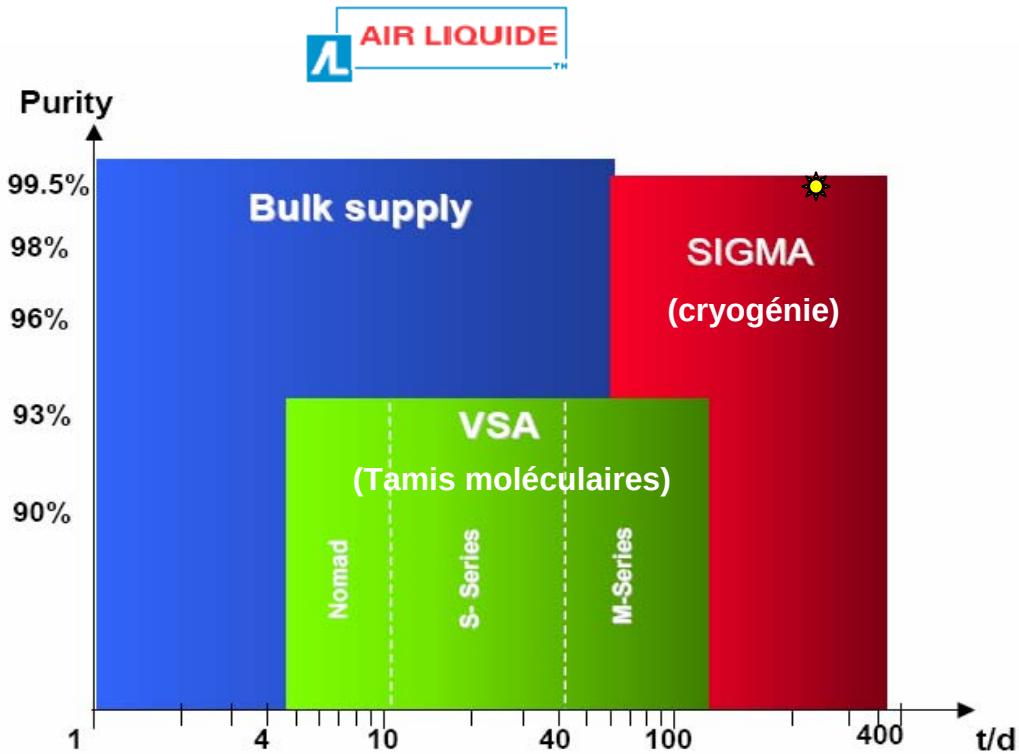
- An integrated CO2 Capture, Transportation, Injection and Storage pilot plant

CO2 CAPTURE → **CO2 TRANSPORT AND INJECTION** → **CO2 STORAGE**



- Assess the technical feasibility of a cost attractive full carbon capture and storage scheme adapted to steam generation
- Basis for SAGD heavy oil production upscaling
- Assess the Lacq field potential for long term and larger scale CO2 storage
- Contribute to climate change potential solution under development

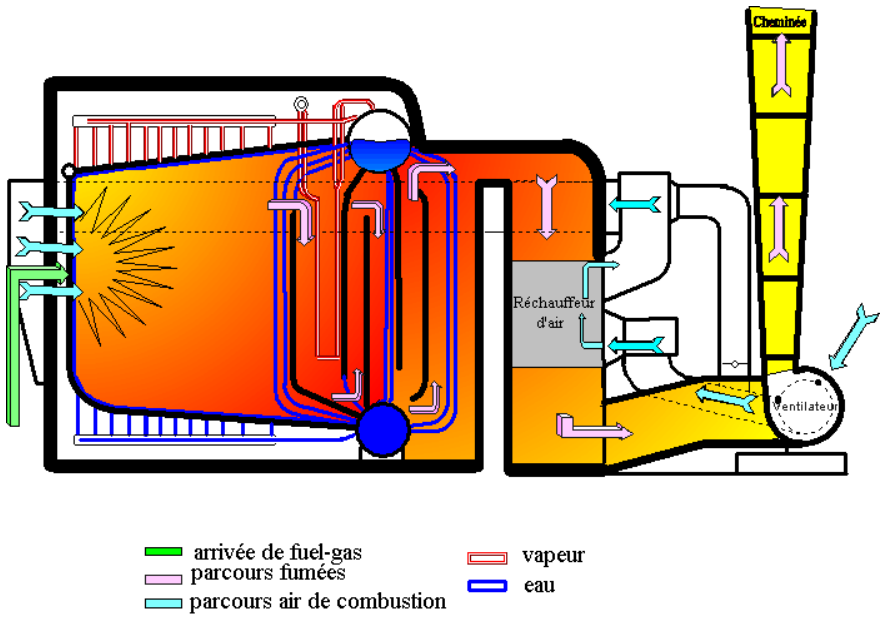
ASU



- **Need # 240 t/day O2**

Boiler revamping

- **Existing boiler revamping with CO2 recycling**



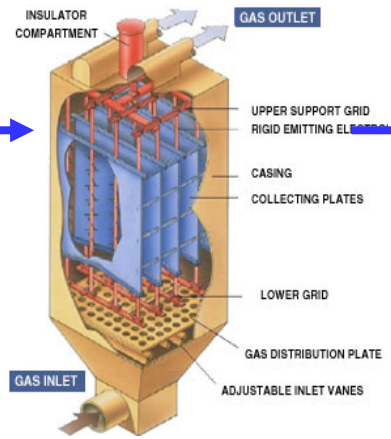
- **ALSTOM involved in boiler revamping study**
- **Air Liquide involved in oxyburner design**

Flue gas treatment

~ 0.2 MNm³/d

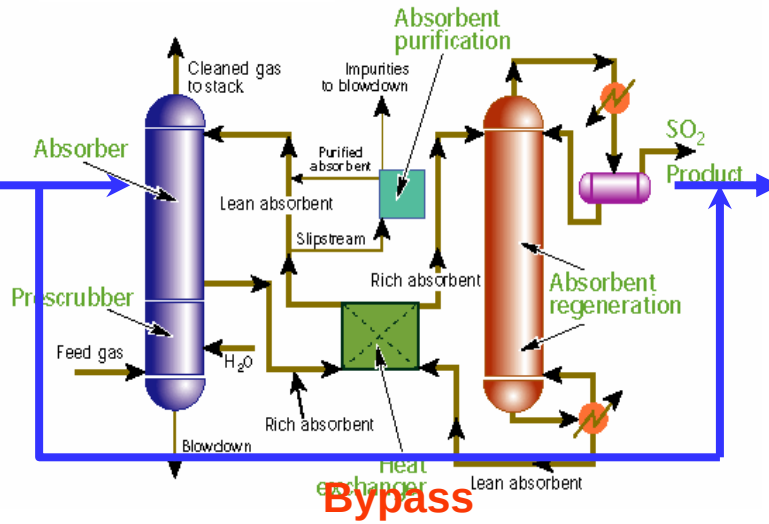
Quench Flue gas

De-SO_3



Cansolv

De-SO_2

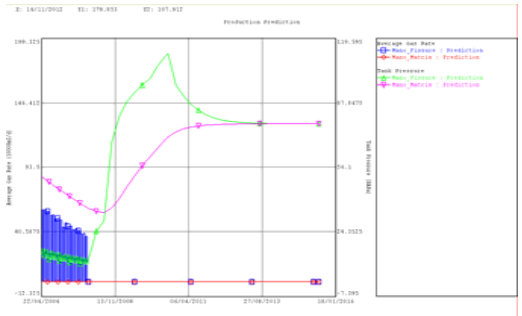


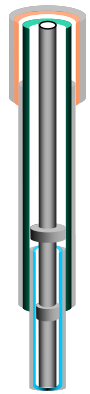
Compression

Total methodology for CO2 injection validation

Key steps of the storage site qualification in progress

1/ Validation of storage capacity

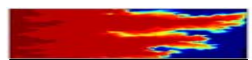




2/ Injection strategy and well hydraulic modelling

3/ CO_2 migration and long term fate modelling

Gas in place	
$(Na^+, Ba^{2+}, Sr^{2+}, Cl^-)$	
Minerals	
Dolomite:	87 %
Calcite:	6 %
Quartz:	4 %
Anhydrite:	3 %



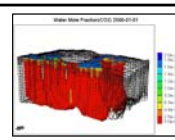
Chess & Hytec

Select main geochemical reactions at a local scale

Lab experiment for calibration and matching

GEM

Activate main reactions for global reservoir/geochemistry simulation



4/ Risk Assessment and Impact Assessment

5/ Monitoring strategy