



● Incentives and regulations for CCS in the EU

Directorate-General
for Energy

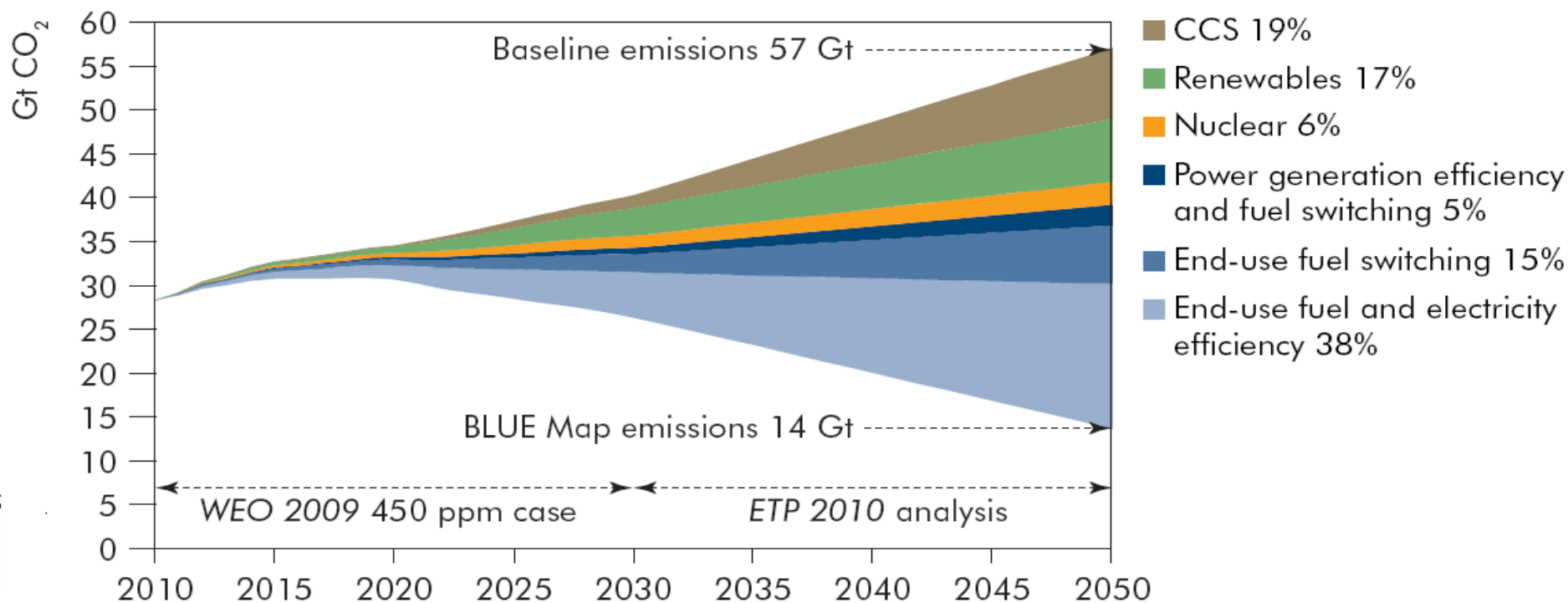


European Union, Delegation to Ukraine
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12/05/2011

Why CCS ?

According to the IEA, 19% of achievable CO₂ reductions by 2050 can be achieved by CCS



Source: IEA

● Why CCS on gas ?

- CO₂ reduction by 80-95% by 2050 effectively means that CO₂ emissions from electricity generation have to be almost zero

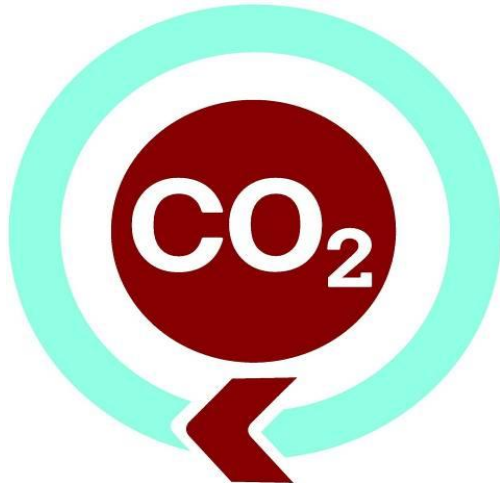
● Emission of CO₂ in 2007

- Total (Gt CO₂ ekv)
 - » World 27.940
 - » EU 27 5.045 (15%)
- Relative (t CO₂ ekv per GDP PPP 2000 USD)
 - » World 0.47
 - » EU 27 0.32

● Gross Electricity Generation from Coal in EU (2009) in TWh and percent share

● EU 27	988	(30%)
● Poland	146	(91%)
● Czech Rep.	53.8	(60 %)
● Denmark	20	(50%)
● Germany	300	(47%)
● UK	137	(35%)
● Spain	73	(24%)
● Netherland	25	(24%)
● France	24	(4%)

● EU Policy Goals



- Demonstrate CCS by 2015
- Commercially viable CCS by 2020

Addressing the challenges

Legislative hurdles

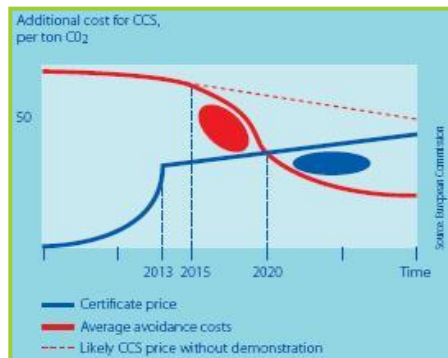
- » Storage is enabled by the CCS Directive (2009/31/EC)

Long-term economic viability

- » CO₂ captured, transported and stored considered as not emitted

Non-legislative hurdles

- » Financing large-scale demonstration
- » Knowledge sharing
- » Public perception
- » Infrastructure needs
- » R&D in CCS



● Financing CCS demonstration - EEPR



- €1bn for large-scale CCS demos
 - » Max. €180m per project for incremental CCS investment costs

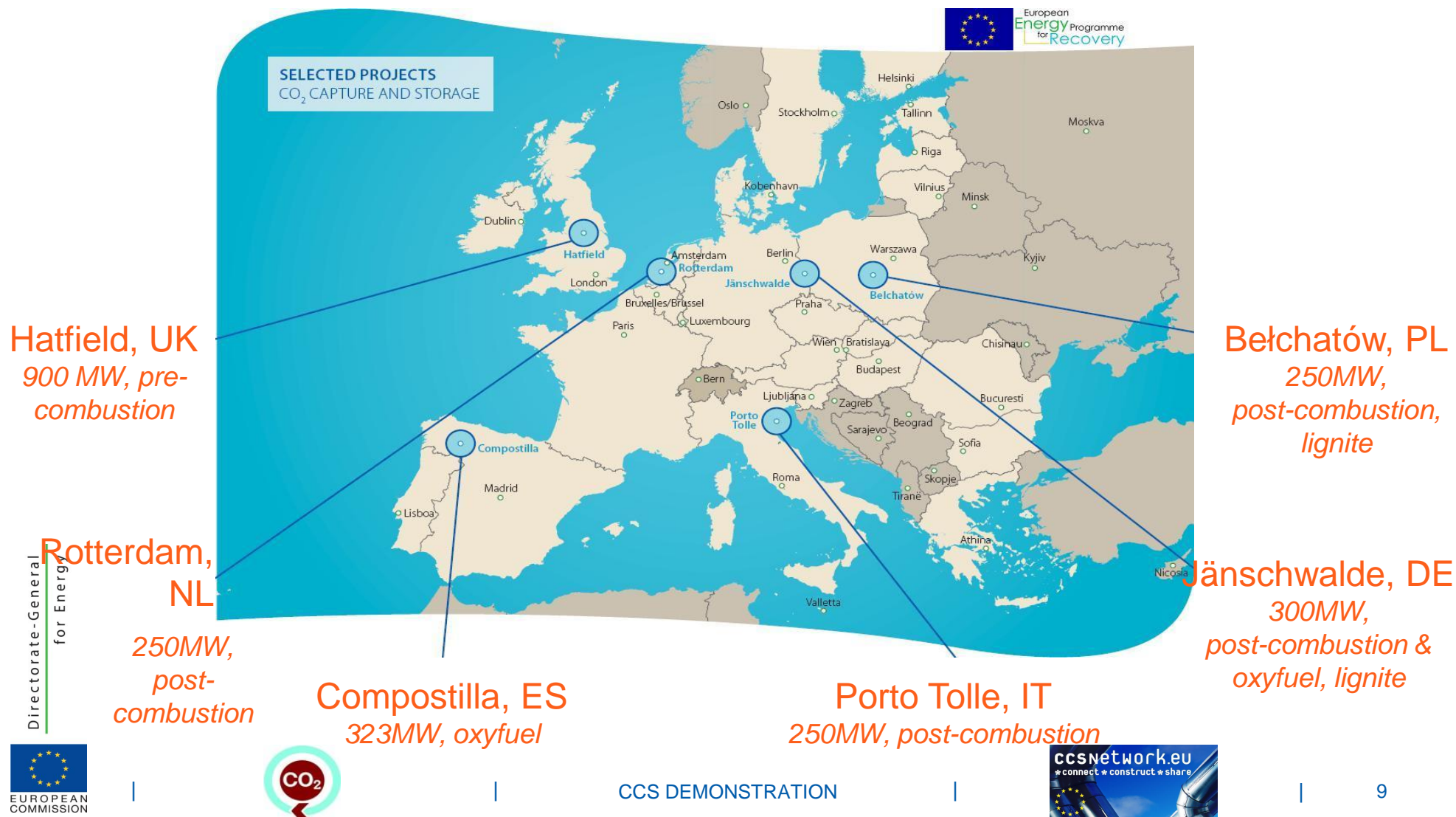


Source: Powerfuel

- 6 projects have signed grant agreements in 2009/10
 - » Jämschwalde, Hatfield, Porto Tolle, Rotterdam, Bełchatów, Compostilla

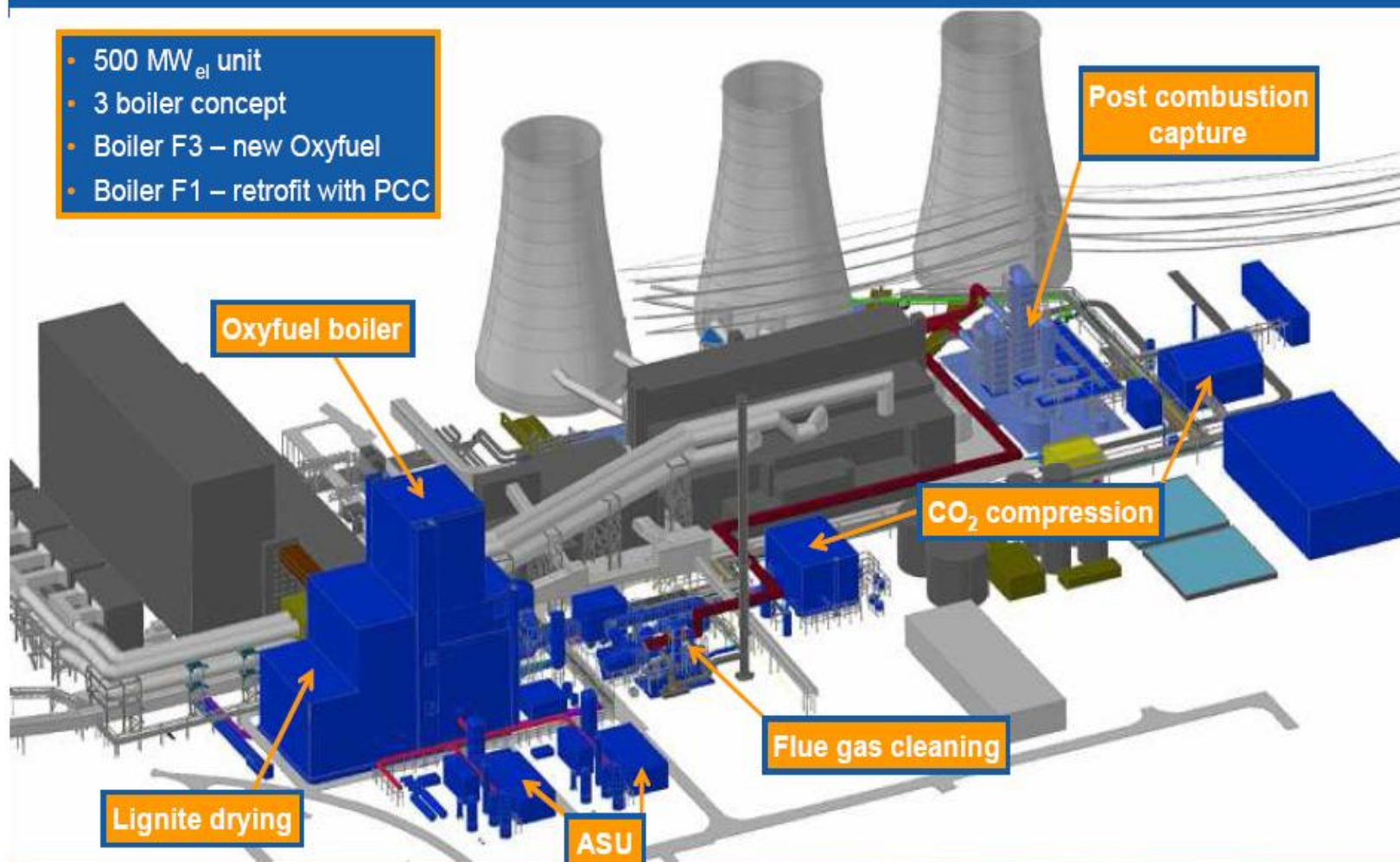
Financing CCS demonstration

EEPR, €1bn funding for 6 projects



Technical layout of CCS Demo Jämschwalde

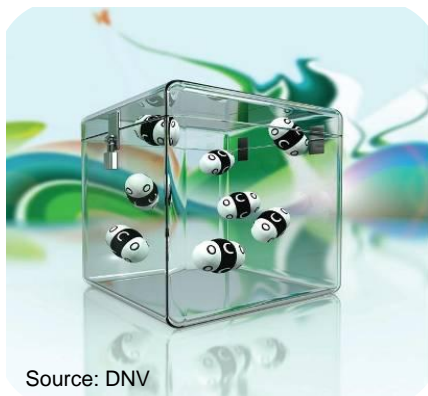
- 500 MW_{el} unit
- 3 boiler concept
- Boiler F3 – new Oxyfuel
- Boiler F1 – retrofit with PCC





Financing CCS demonstration

New Entrants Reserve (NER 300)



- Revised ETS Directive (2009/29/EC)
 - » 300 million CO₂ allowances (EUAs)
 - » CCS & innovative renewables demos
- Decision on modalities 2010
 - » A range of CCS technologies
 - » 8 projects with up to 3 in 1 country
 - » Award depends on verified CO₂ avoided
- Timetable - 1st call (200m EUAs)
 - » Call published 9th Nov 2010
 - » Around 20 proposals received
 - » 2012 - Award Decision
- Timetable - 2nd call (100m EUAs)
 - » Call to be published in 2013

Knowledge Sharing

CCS Demonstration Project Network

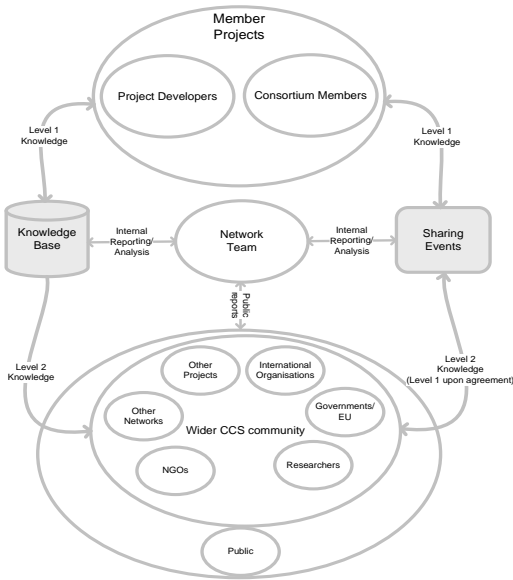


● Overview

- » Provide first movers with a means of coordination, exchange of information and experience and identification of best practices

● Objectives

- » Knowledge sharing
- » Public engagement
 - Consistent, collective and coordinated communication will be more cost-efficient and have higher impact
- » Co-operation with 3rd parties
 - Global CCS knowledge sharing
 - Promote EU CCS demonstration



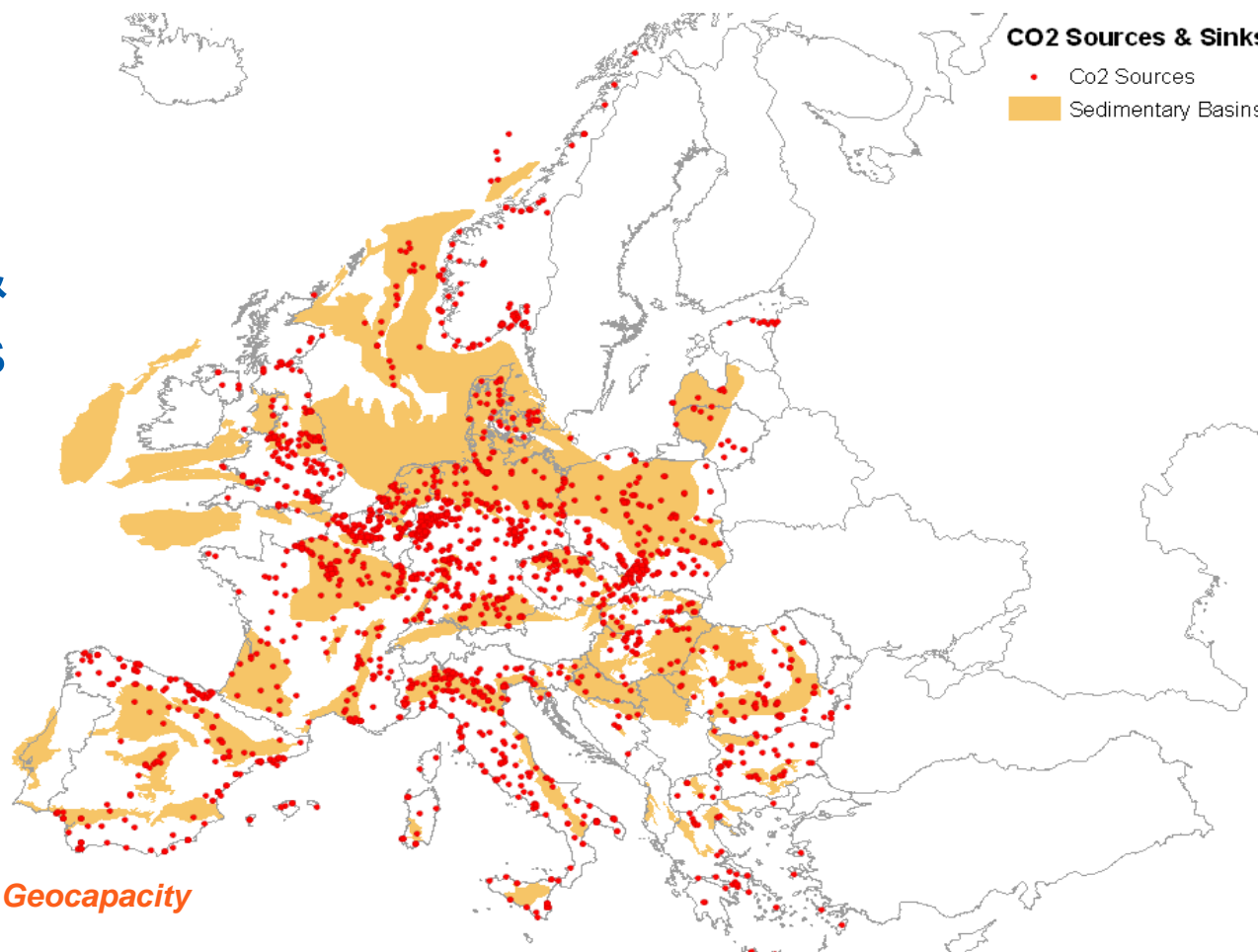
CO₂ Infrastructure



- New infrastructure needed to facilitate a successful transition to a low carbon energy system
- Communication on new Energy Infrastructure Instrument
 - » Covering *inter alia* CO₂ infrastructure
 - » Followed by legislative proposal Spring 2011

CO₂ Infrastructure

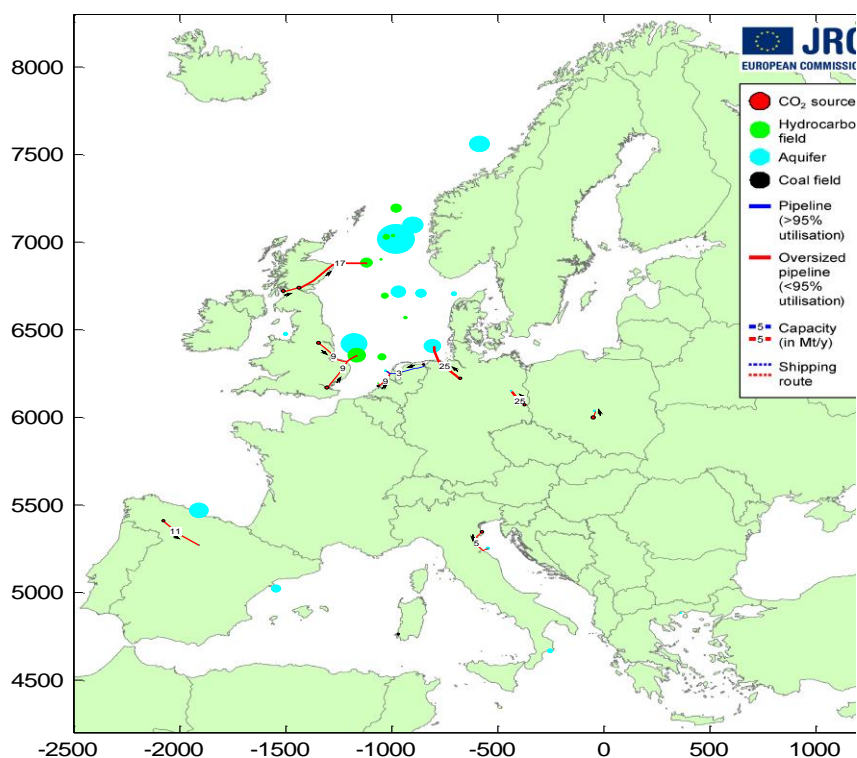
Connect
emission
sources &
CO₂ sinks



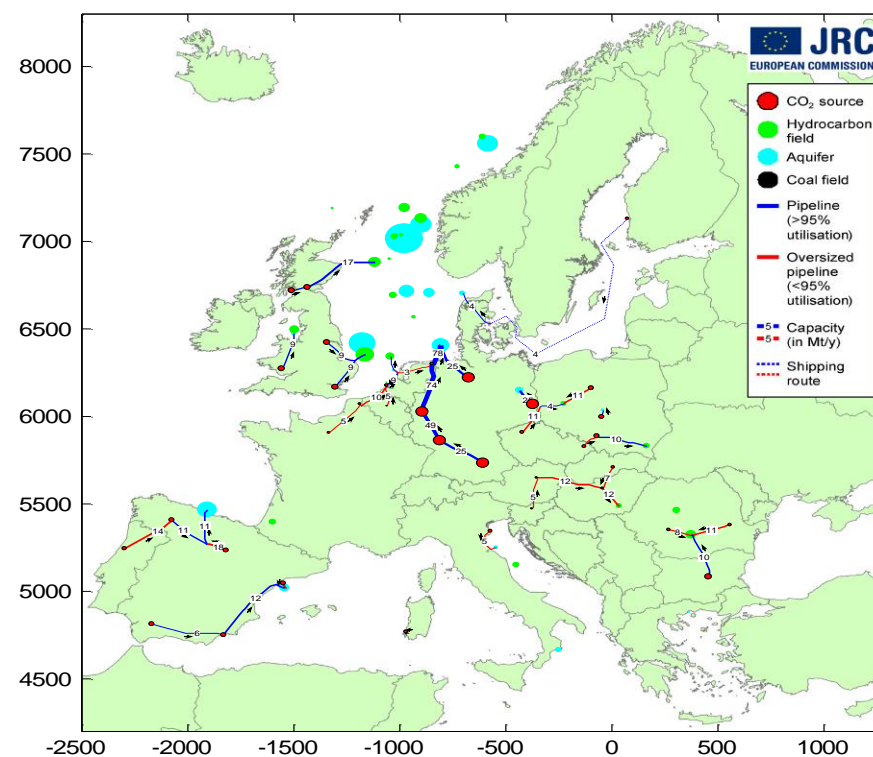
CO₂ Infrastructure

possible developments 2020/2030

YEAR 2020 - 2005km network - 2.5 billion EUR cumulative investment



YEAR 2030 - 8803km network - 9.1 billion EUR cumulative investment



CCS R&D

SET plan - European Industrial Initiative for CCS

- launched on 3 July 2010 in Madrid



- Dual Approach followed
 - » Large demonstration programme
 - » R&D building on & complementing CCS demo activities
- Better use of public-private resources
 - » Identify synergies
 - » Synchronise agendas (timeline, actions)
- Innovative, industry-driven, co-operation
 - » Industry, EU Member States, EC, European Energy Research Alliance (EERA), Research Institutes, NGOs
- Next steps - from planning to implementing
 - » Refine KPIs for monitoring & progress reporting
 - » Identify top R&D priorities for 2011

Conclusions

- Fossil Fuels can only remain part of the energy mix if combined with CCS
- Joint effort of EC, MS and industry are needed to realise the potential of CCS:
 - » CCS directive has to be transposed quickly into national law
 - » Sufficient financing has to be provided to support CCS demonstration
 - » Joint efforts needed to work towards higher public acceptance
- The role of Research
 - » Next generation of capture technologies
 - » Storage and communication of its safety

● Thank you for your attention

