



Z E P
Technology Platform
Zero Emission Fossil Fuel Power Plants

Report from ZEP

ECCP Working Group on CCS

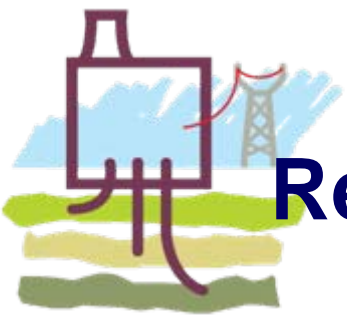
Brussels, 8 May 2007

Arve Thorvik, Vice President, Statoil EU Affairs Office



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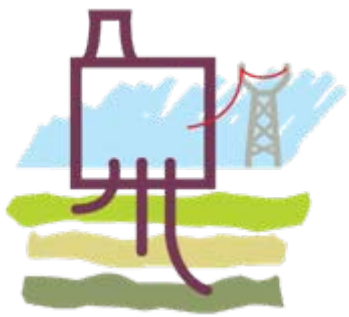
The Context



Climate change – Reduction targets and ambitions for 2020

EU:	- 20 %
Norway:	- 30 %
Germany :	- 40 %
US:	?





The goal is Zero Emissions Power (ZEP)...



*...carbon capture
and storage
(CCS) is
identified as an
essential part of
the solution*



EU-US Summit 30 April 2007:



Agreement on **CCS** as a **key priority** in the cooperation:

Advancing **commercialization of CCS**

Technologies:

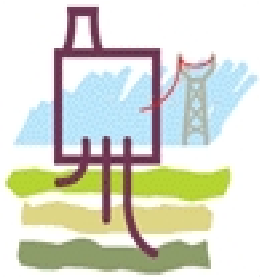
- **Policy incentives** to reduce cost and other barriers
- **Bilateral cooperation** on CCS





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ZEP Phase 1



ZEP Phase 1: Main Conclusions

Strategic Research Agenda (SRA):

- **10 -12 integrated, large-scale CCS demonstration projects**
- Long-term exploratory R&D for next-generation technology by 2050

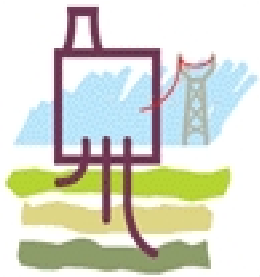
Strategic Deployment Document (SDD):

- **Legal and long-term regulatory framework**, accreditation of CCS under EU ETS, CDM/JI
- Potential storage locations for 10-12 large-scale demonstration projects
- **10-12 CO₂ capture demonstrations and 4-6 onshore storage sites**



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ZEP Phase 2



ZEP Phase 2

Focus:

- Technology
- Demonstration and Implementation
- Policy and Regulation
- Public Communication



Policy and Regulation Task Force

- Managing the **Risks**
- Legislative barriers and **Regulatory Framework**
- **Market** Mechanisms
- Financial **Incentives**
- Other regions: **US**, China



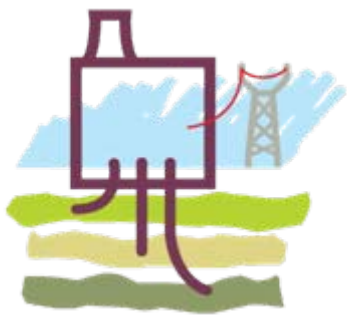


Policy and Regulation Task Force – Sub-group Regulatory Framework

Principles:

1. **Amending current legislation** instead of new framework
2. Regulatory **separation** of CO₂ **value chain**
3. New EU **legislation only for storage**
4. **Subsidiarity** principle





ZEP Public Communication Task Force

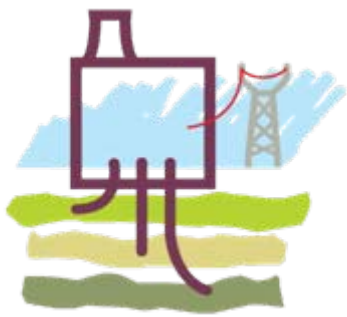
Goal: Wide acceptance of CCS in Europe

Actions:

- **Strategy for social acceptance of CCS including business case study**
- **CCS website**
- **University debates**

Need for funding





ZEP Technology Task Force

Report on recommendations for CCS in the next FP7 Programme:

- **R&D to enable 10-12 CCS demonstration projects** across Europe
 - **R&D in support of new concepts**, for demonstration by 2010-2015 and implementation beyond 2020
- Delivered to DG Research on 1 May 2007

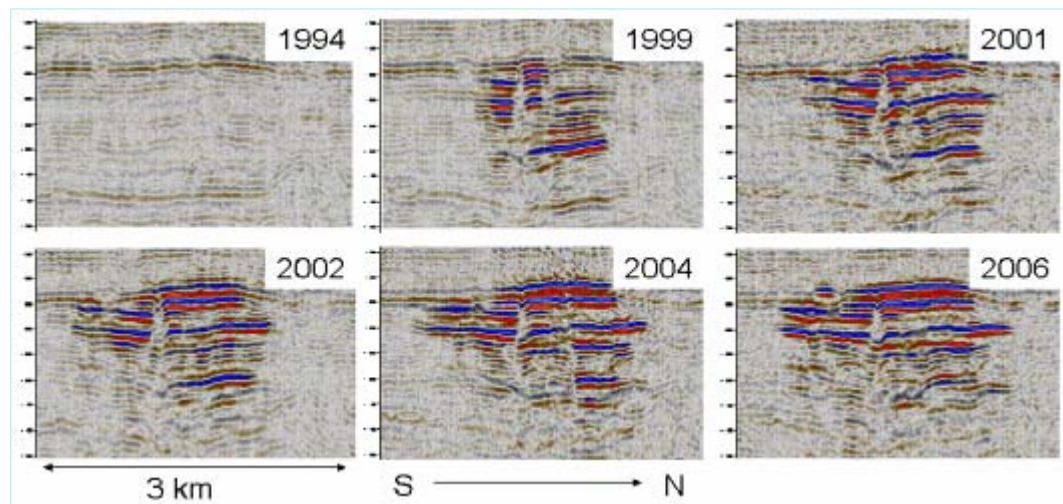


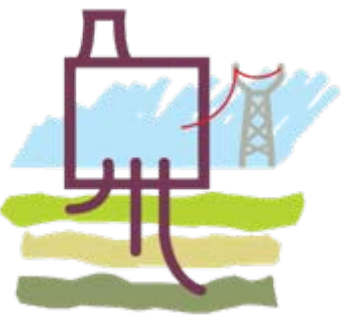


ZEP Technology Task Force

Objectives for 2007:

- **Coordination** between national programmes and FP7, and international programmes
- Maintain **Strategic Research Agenda**
- Map the need for additional **finance** for R&D





ZEP Demo and Implementation Task Force

Objective: Realisation of 10-12 demonstration projects

Main issues:

- Organisation and financing of demonstration plants
- Dissemination of knowledge
- Map regulatory problems

 **Link with Flagship Group**

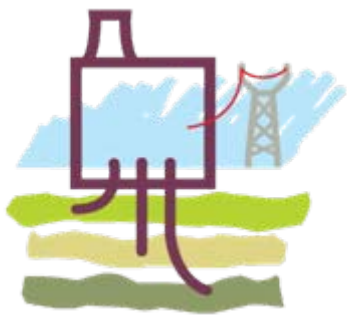




ZEP

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ZEP Flagship Programme



ZEP and EU Spring Council

ZEP Vision:

- Develop and deploy **new competitive options for zero emission power** within the next 15 years
- **10-12 full scale commercial plants that will be in place and operational by 2015**

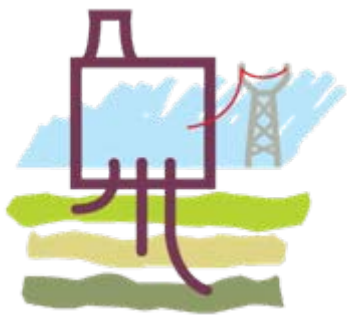


EU Decision:

*” establish a **mechanism to stimulate the construction and operation by 2015 of up to 12 demonstration plants of sustainable fossil fuel technologies...**”*

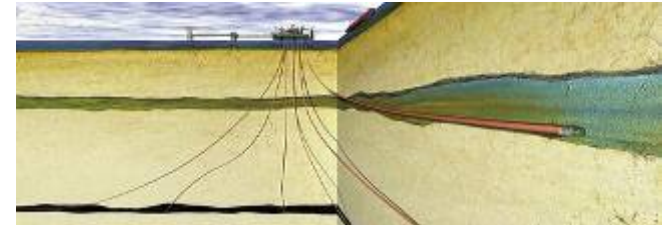


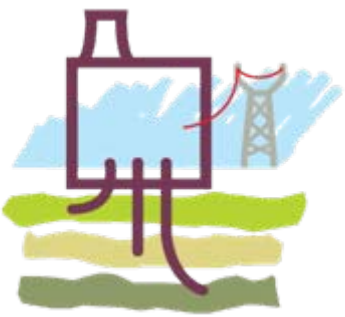
ZEP Flagship Programme



Flagship Programme: Objectives

- **Technological upscaling**
- Improve **cost-effectiveness & availability** of capture technologies
- Assess **storage potential**
- EU level **partnerships**
- Full scale **commercial deployment** post 2020
- **EU leadership**

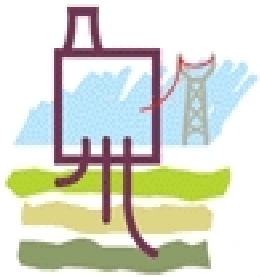




Flagship Programme: Tasks

- **Demonstrate** different fuel and plant **technologies** and geological **storage sites**
- **Geographic spread**
- Help define **policy mechanisms**
- Go down **learning curve**





CCS Projects on the drawing board:

approx. 16 -18 CCS Projects in Europe

France: 2

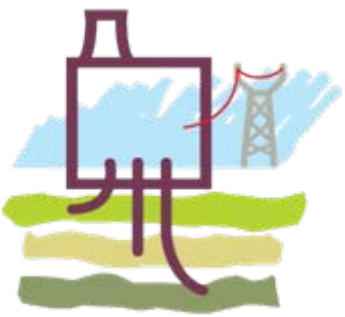
Germany: 3

Italy: 1

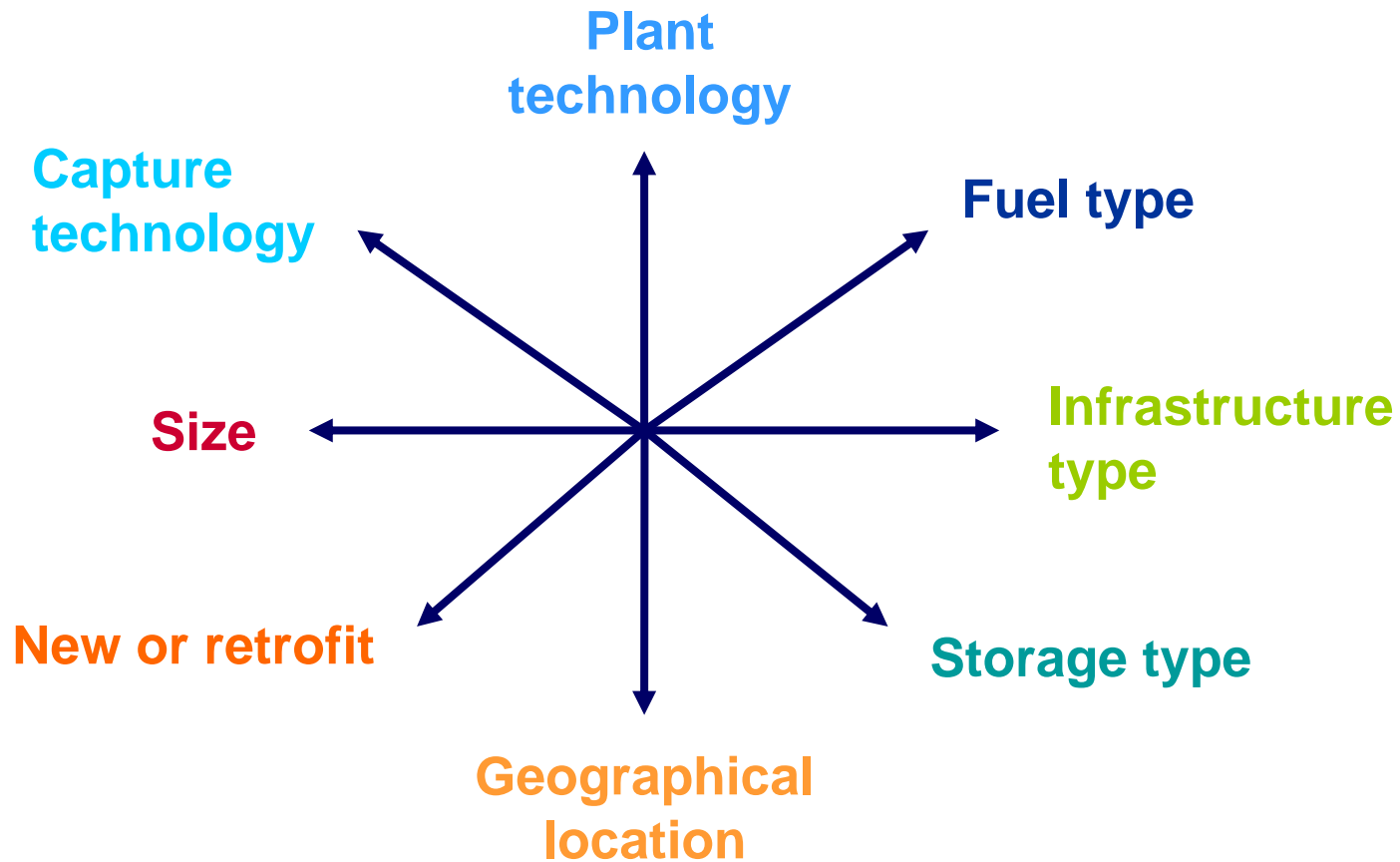
Netherlands: 1

Norway: 4

UK: ~7



Flagship Programme – Criteria to be considered





Flagship Programme

A simultaneous execution of a top down and bottom up approach

TOP DOWN
Framework
(ZEP)



BOTTOM UP
Projects
(EU)



STATOIL

Experience

Sleipner

Start in 1996

1 mill. tons per year



In Salah

Start in 2004

1 mill. tons per year



Snøhvit

Start in 2007

0,7 mill. tons per year



Mongstad

**Stage 1: start in 2010
Stage 2: start in 2014**

**0,1 mill. tons per year
2 mill. tons per year**



Halten

Start in ~ 2012

~ 2 mill. tons per year

