



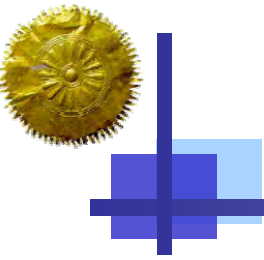
International Conference
“2nd South East Europe Energy Dialogue”
Thessaloniki, 21-22 May 2008



Fossil Energy Technology Platform

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**Centre for Research & Technology Hellas/ Institute for Solid Fuels Technology &
Applications (CERTH/ISFTA)**



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- ✓ **European Technology Platform for power generation from zero emission fossil fuels (ETP ZEP)**
- ✓ **Flagship Program**
- ✓ **CCS - CO₂ storage technologies**
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- ✓ **CO₂ geological storage in Greece**
- ✓ **Conclusions**



The European Energy Technology Platform (1)



The European Technology Platform on Zero Emission Fossil Fuel Power Plants-ZEP TP

Vision:

Power generation from zero emission fossil fuels on European level until 2020.

Official announcement date:

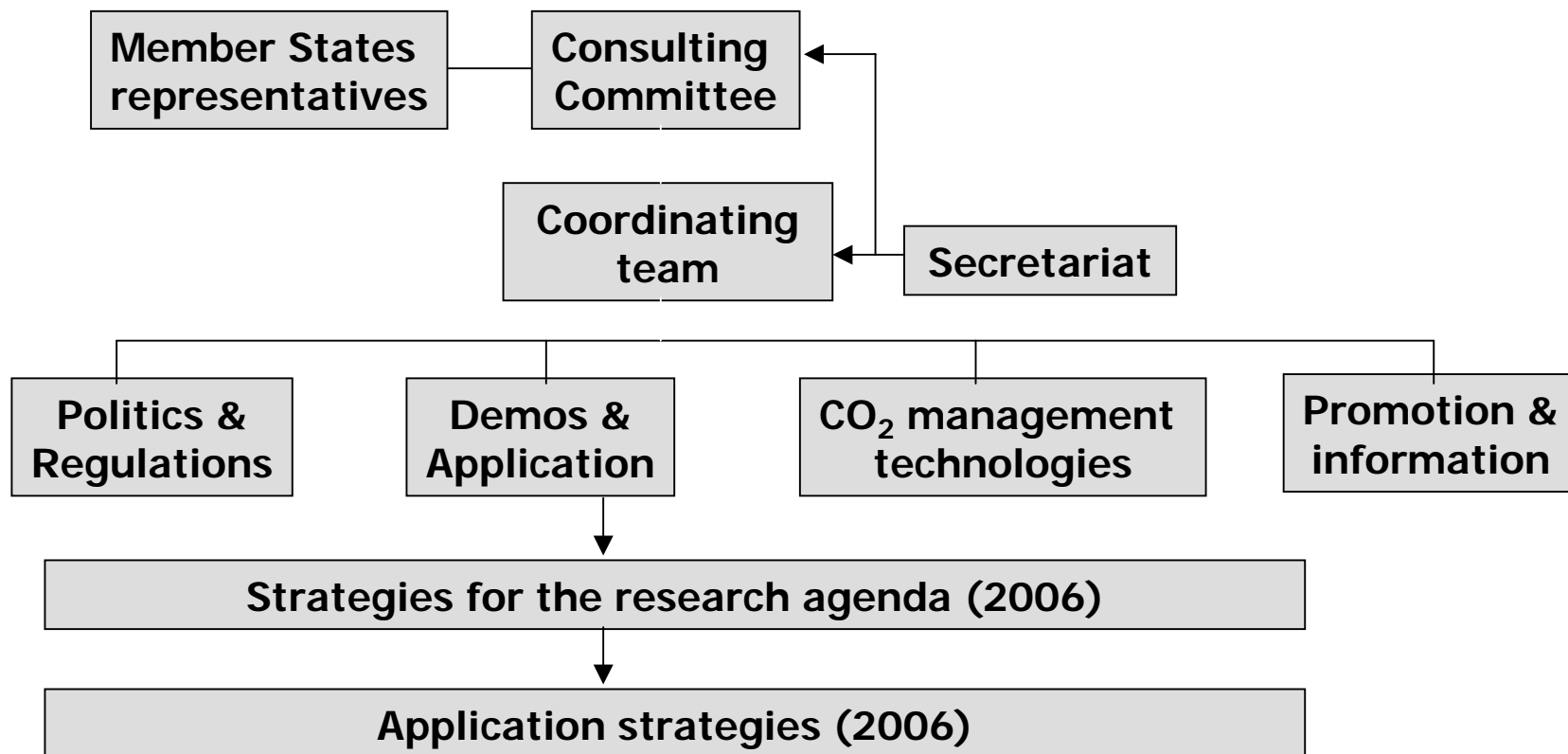
December 1st, 2005



The European Energy Technology Platform (2)



ZEP organizing chart





The European Energy Technology Platform (3)



Composition of the ZEP Consulting Committee

- 1. Energy supplying companies**
E.ON, Endesa, Enel, Energi E2, RWE, Vattenfall
- 2. Energy equipment industries**
Ansaldo, ALSTOM, Air Liquide, Foster Wheeler, Doosan
- 3. Gas & Petroleum companies**
BP, Shell, Statoil, Total, Schlumberger
- 4. Research institutes**
BGS, CIRCE, IFP, Polish CMI, GEUS, TU-Hamburg
- 5. Non governmental organizations**
Bellona, E3G, WWF
- 6. Investment organizations**
Morgan Stanley



The European Energy Technology Platform (4)



ZEP special committees Task sections

- ✓ **Political and regulation framework**
Preparation of the necessary institutional framework for the wide application of the CO₂ capture and storage projects, in cooperation with the E.U. and the Member States
- ✓ **Demos & Application**
Demo operation of 10-12 large scale projects of CO₂ capture and storage, fossil fuels stations, until 2015 (Flagship Program)
- ✓ **CO₂ management technologies**
Insurance of the commercial maturity of the capture and storage technologies by 2020
- ✓ **Information & Promotion**
Information on the results, dissemination and public acceptance of CCS

Executive Committee Recruiting: 200 experts from the energy field

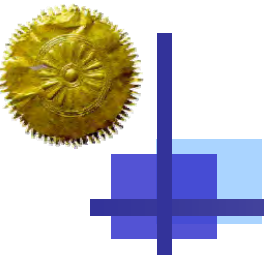


The European Energy Technology Platform (5)



ZEP large scale projects

Company	Technology	Ισχύς Μονάδας [MW]	Estimated cost	Starting place and time
VATTENFALL	Pilot coal unit with CO ₂ capture	30	40 M €	Germany 2008
BP and partners	Conversion of natural gas in H ₂ , CO ₂ capture	350	600 M\$	Scotland 2009
STATOIL/SHELL	Capture, transport and storage of CO ₂ in a natural gas field	860	1-1,5 bil€	Norway 2010-2011
RWE	IGCC-CO ₂ capture and storage	450	1 bil€	Germany 2014
SIEMENS	IGCC-CO ₂ capture and storage	1000	1,7 bil€	Germany 2011
GE/POLISH UTILITY	IGCC- CO ₂ capture and storage	1000	N/A	Poland N/A

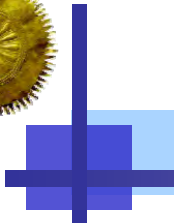


ZEP Flagship Program (1)

«Planning, construction and operation of 10-12 large scale demo units in which will be tested different ways of CCS incorporation to the power generation with coal and gas combustion up to 2015»

TARGET

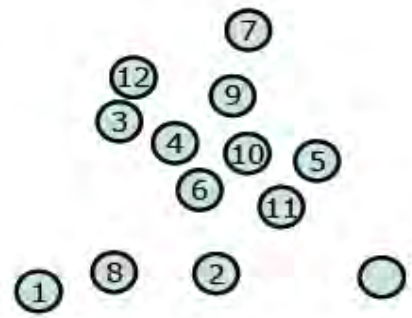
Achievement of the CCS commercial viability by 2020 for the new plants thus permitting the transition towards sustainable fossil fuels for the power generation.



ZEP Flagship Program (2)

Need for cooperation at European level

No strategy between the projects



Independent demo projects for the development and verification of the technologies



EU Flagship program



Concerted program of demo projects on European level

The value of the networking lies in the avoidance of the repetition of the efforts and the alignment of the priorities through improved co-ordination and knowledge exchange.



Energy Technology Platform



ZEP and Greek Energy Platform collaboration activities:

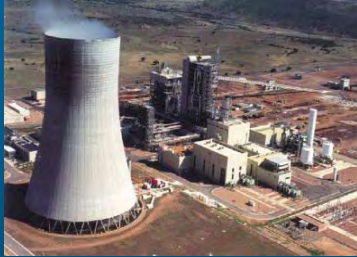
- ZEP experts participation in meetings that will be carried out in the frame of the information activities of the Greek Energy Platform
- Presentation of the Greek Research Strategy Agenda in corresponding ZEP activities
- Observation of the ZEP results not only through the open information activities but also through the ISFTA executives participation in ZEP meetings



CCS technologies



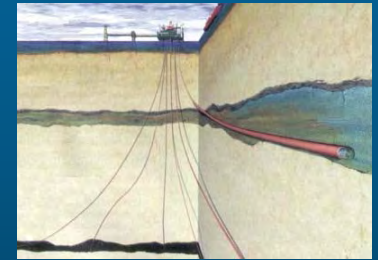
Capture



Transportation

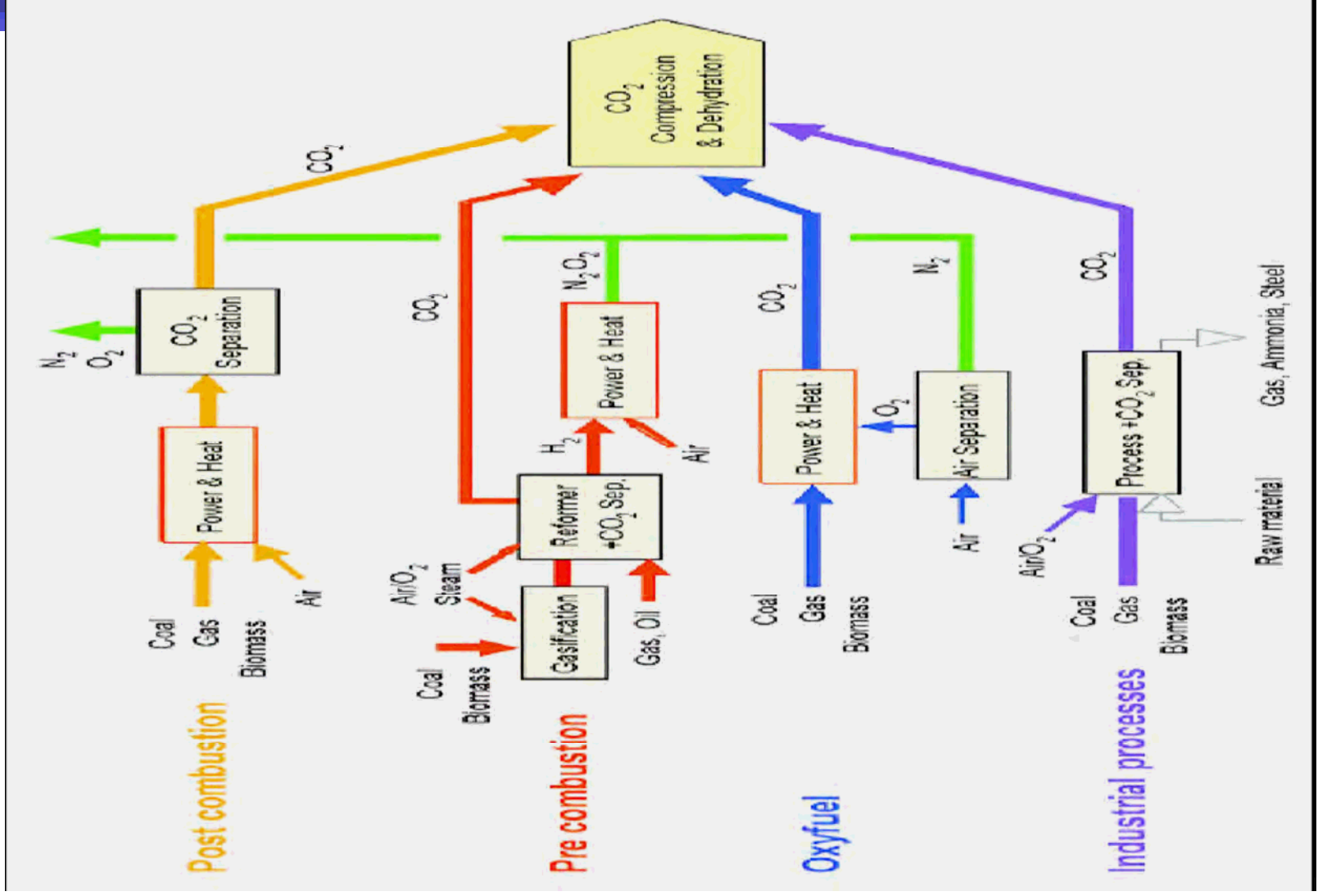


Geological storage





CO₂ capture technologies



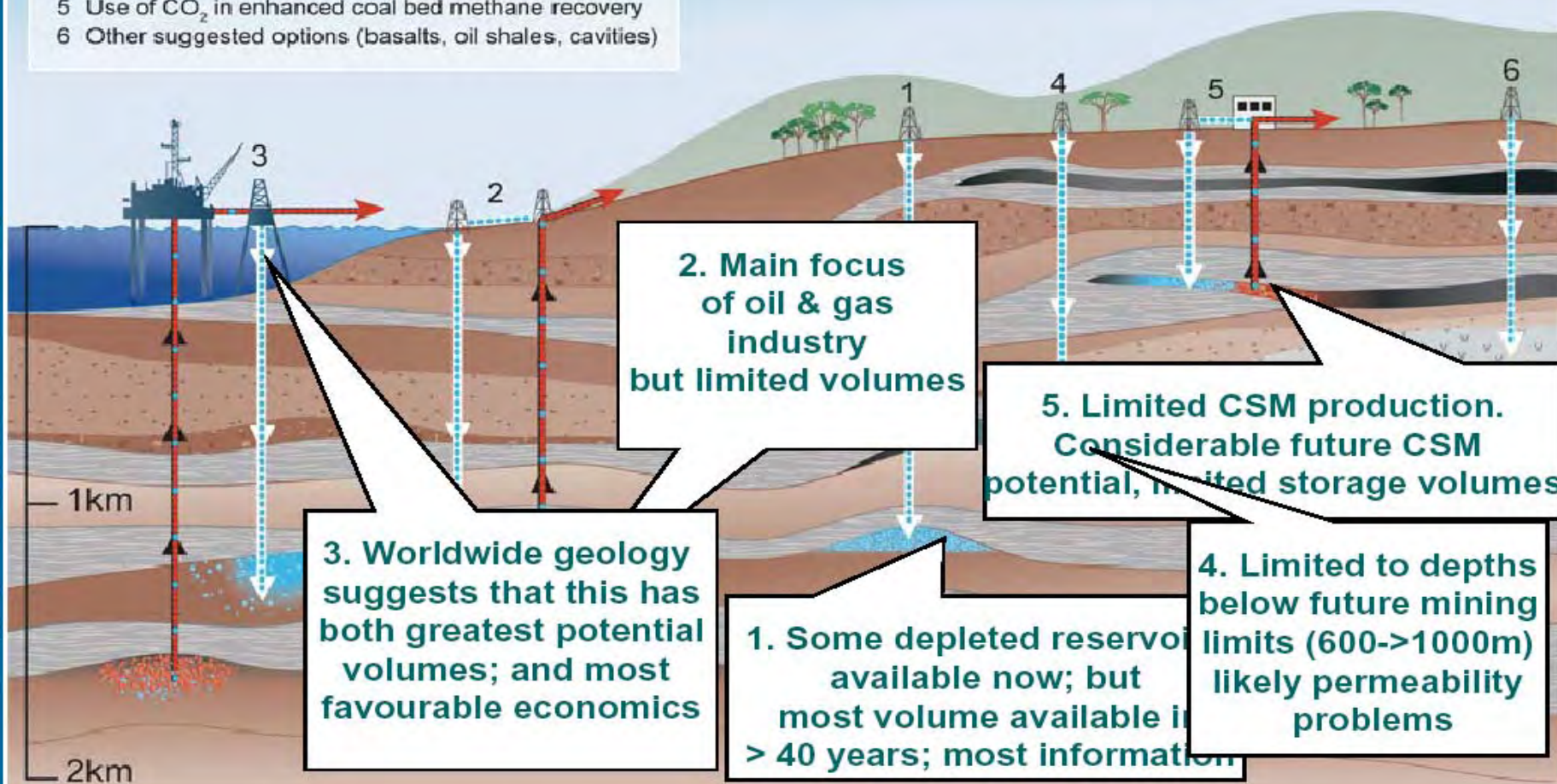


CO₂ geological storage methods



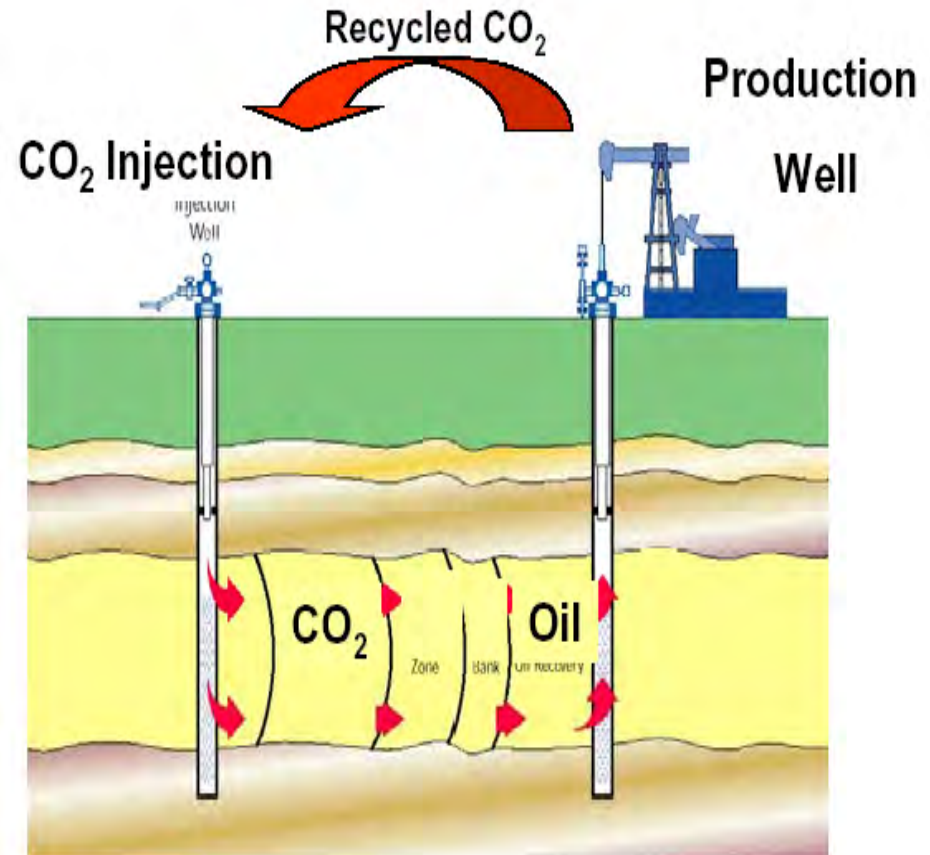
Geological Storage Options for CO₂

- 1 Depleted oil and gas reservoirs
- 2 Use of CO₂ in enhanced oil recovery
- 3 Deep unused saline water-saturated reservoir rocks
- 4 Deep unmineable coal seams
- 5 Use of CO₂ in enhanced coal bed methane recovery
- 6 Other suggested options (basalts, oil shales, cavities)



Storage in active oil fields - Enhanced Oil Recovery (EOR)

- Movement of petroleum through mixture or displacement during CO₂ injection alternating with water in active oil fields, improves its recovery by 10-12%.
- Approximately 60% of the injected CO₂ remains in the sink, while 140-280 m³ CO₂ are demanded in order to produce a barrel of oil.





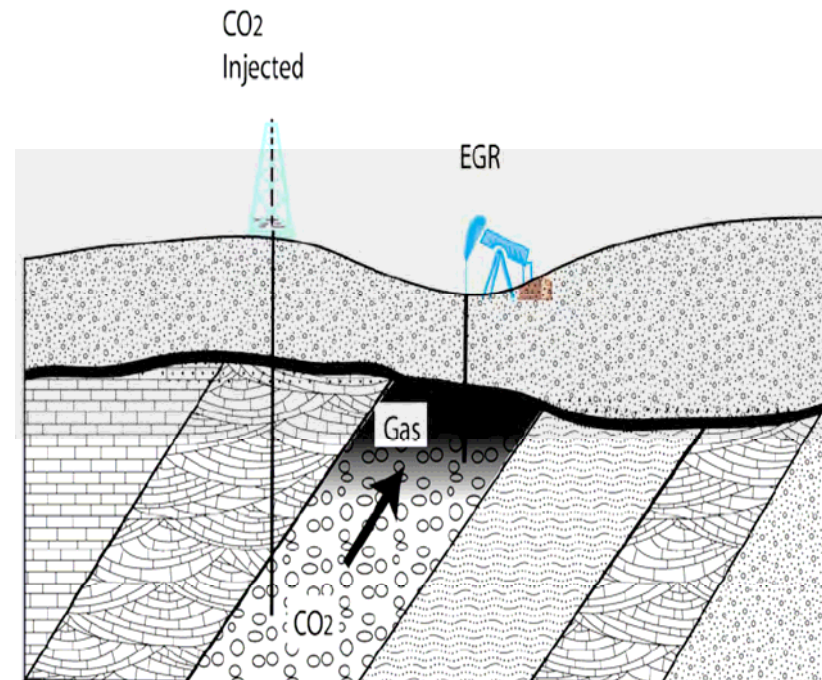
Storage in active oil fields - Enhanced Oil Recovery (EOR)



- The CO₂ - EOR is applied at commercial level in USA, Canada, Turkey, where about 43 Mt/y CO₂ are stored.
- The CO₂ - EOR project in Weyburn of Canada is the only commercial scale project of the world and it is predicted to be stored almost 22 Mt CO₂ that come from fossil fuel power plants and to be recovered about 130 M barrels of oil.
- Oil and gas fields that have already depleted compose the most economically attractive storage method for the near future.

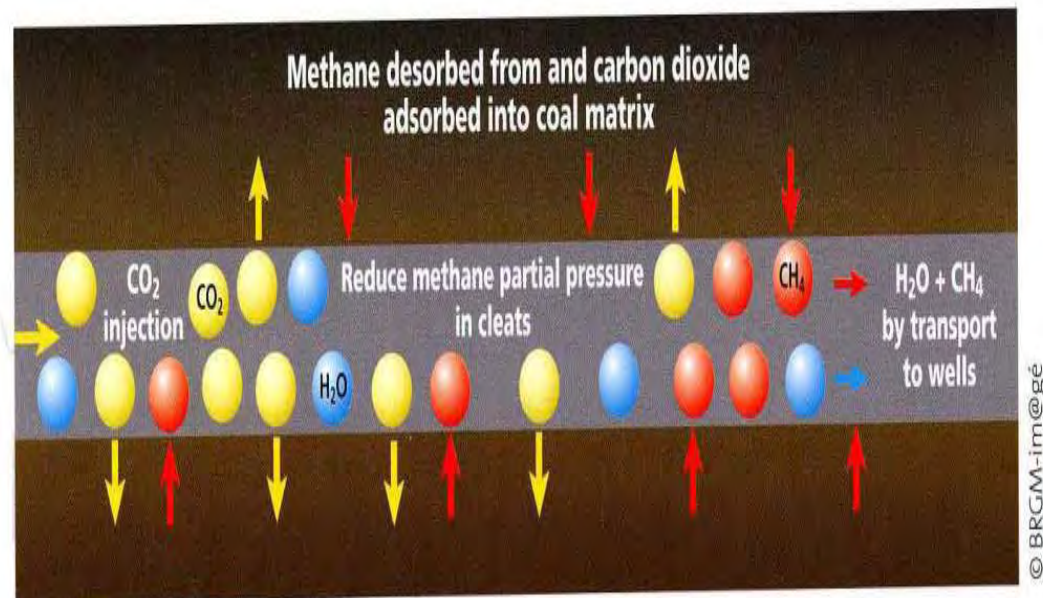
Storage in active gas fields - Enhanced Gas Recovery (EGR)

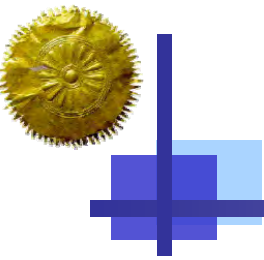
- The EGR method can be applied in fields where the 80-90% of the original deposit has been recovered.
- Considering a starting pressure of 120 bar almost 5-15% of the original deposit can be recovered.
- CO_2 being heavier than the CH_4 , at all temperatures and pressures, tends to move downwards moving CH_4 and increasing the pressure of the sink.
- Yet, there has not been an application of that method at global level.



Storage in unminable coal seams (ECBMR)

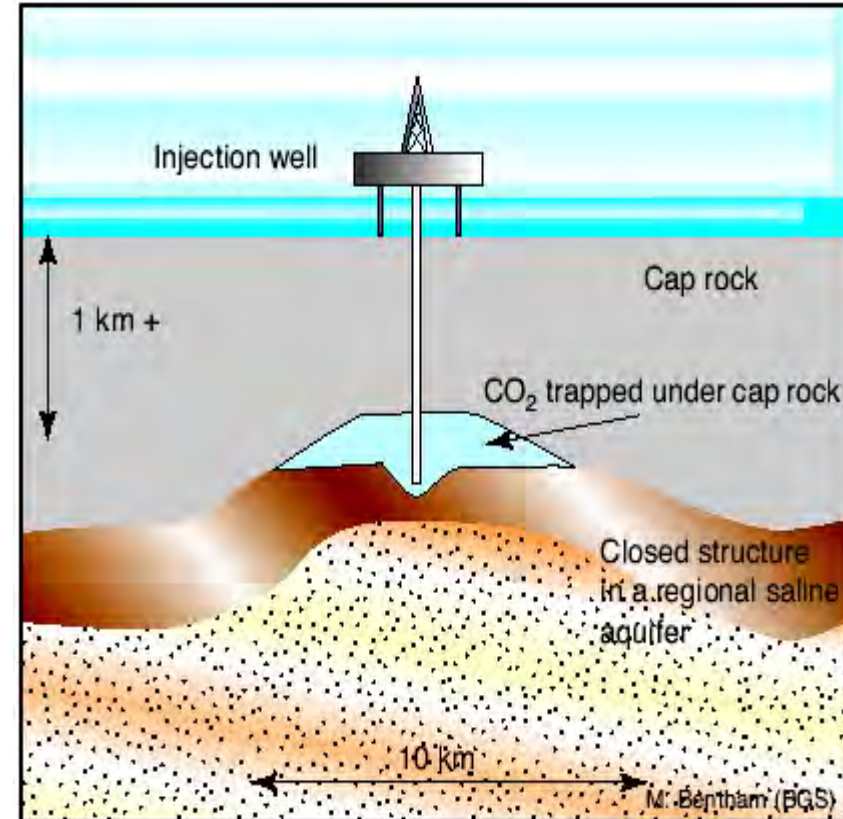
- CO_2 is injected to unminable coal seams, is absorbed in the surfaces of the seams releasing CH_4 , which is recovered as free gas.
- The CH_4 recovery percentage with the use of conventional methods, is around 40-50% while with ECBMR method approaches 90-100%.

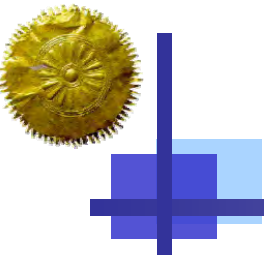




Storage in deep saline aquifer

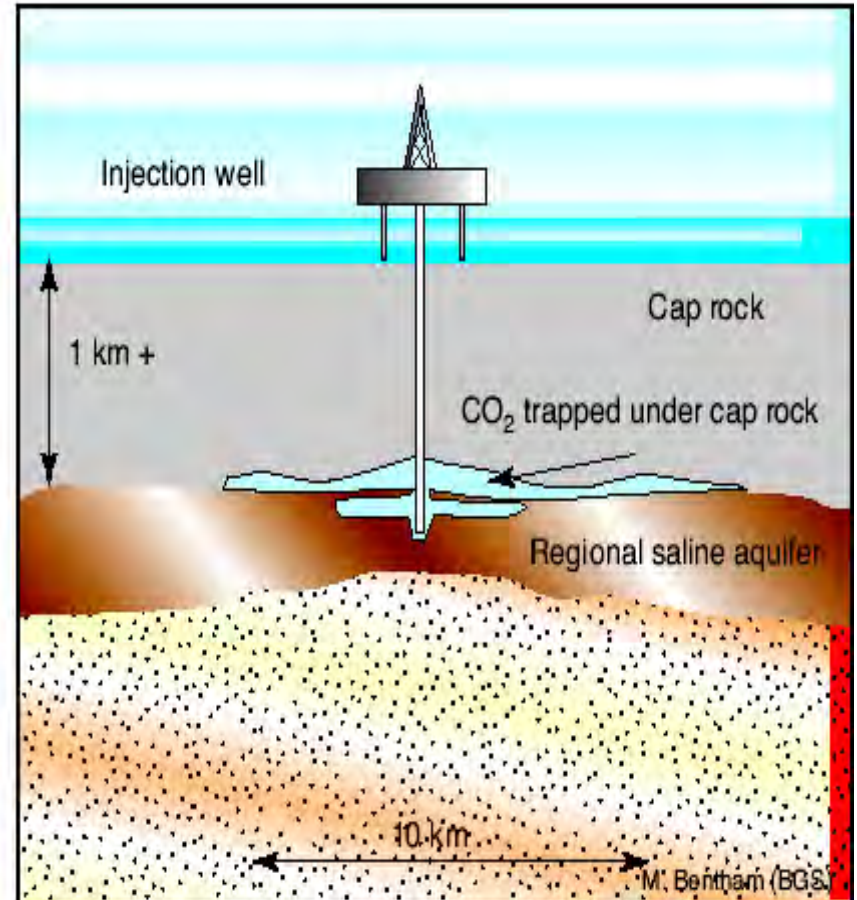
- The storage of CO₂ in confined saline aquifers lies on the entrapment by structural or stratigraphic features, and is closely analogous to gas storage schemes in hydrocarbon fields,
- The potential storage volume in such structural traps can be quite large e.g. the estimated storage capacity of the Bunter Sandstone Formation (on the North Sea) is 620.000Mt of CO₂.

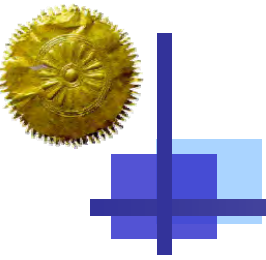




Storage in deep saline aquifer

- CO₂ is moving upwards through the most permeable route until it meets a non – permeable stratum, the cap rock.
- Afterwards, the CO₂ escapes laterally along the boundaries of cap rock - aquifer following the most permeable way where small domes can trap efficiently a percentage of the injected CO₂.



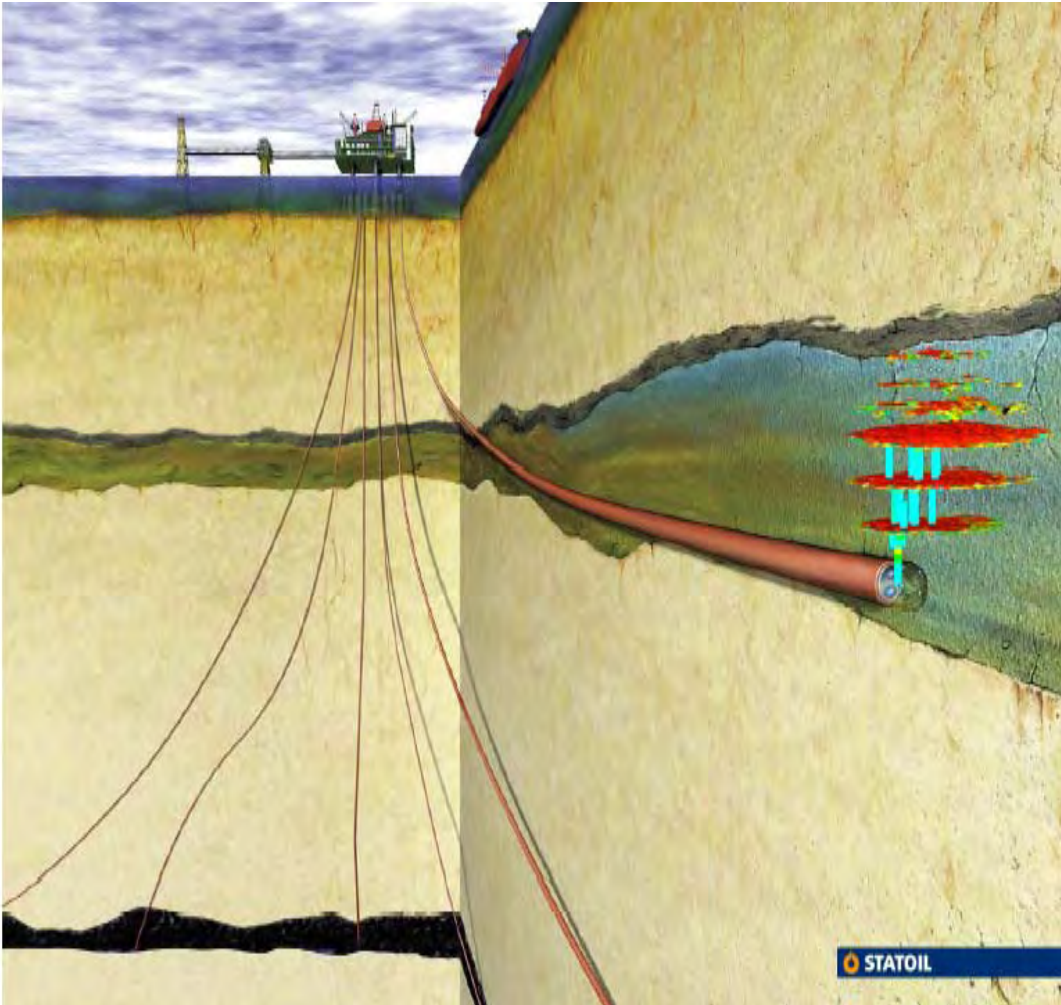


Storage in deep saline aquifer



- As the structural traps are filled, the CO_2 is diffused and begins to migrate laterally.
- With time, the CO_2 will occupy bigger surfaces with low concentrations thus increasing the amount of gas that can be stored in the cavities.
- Because of the likely large migration path ways, the component of storage due to dissolution is increased significantly making it unlikely for the CO_2 to reach the surface.

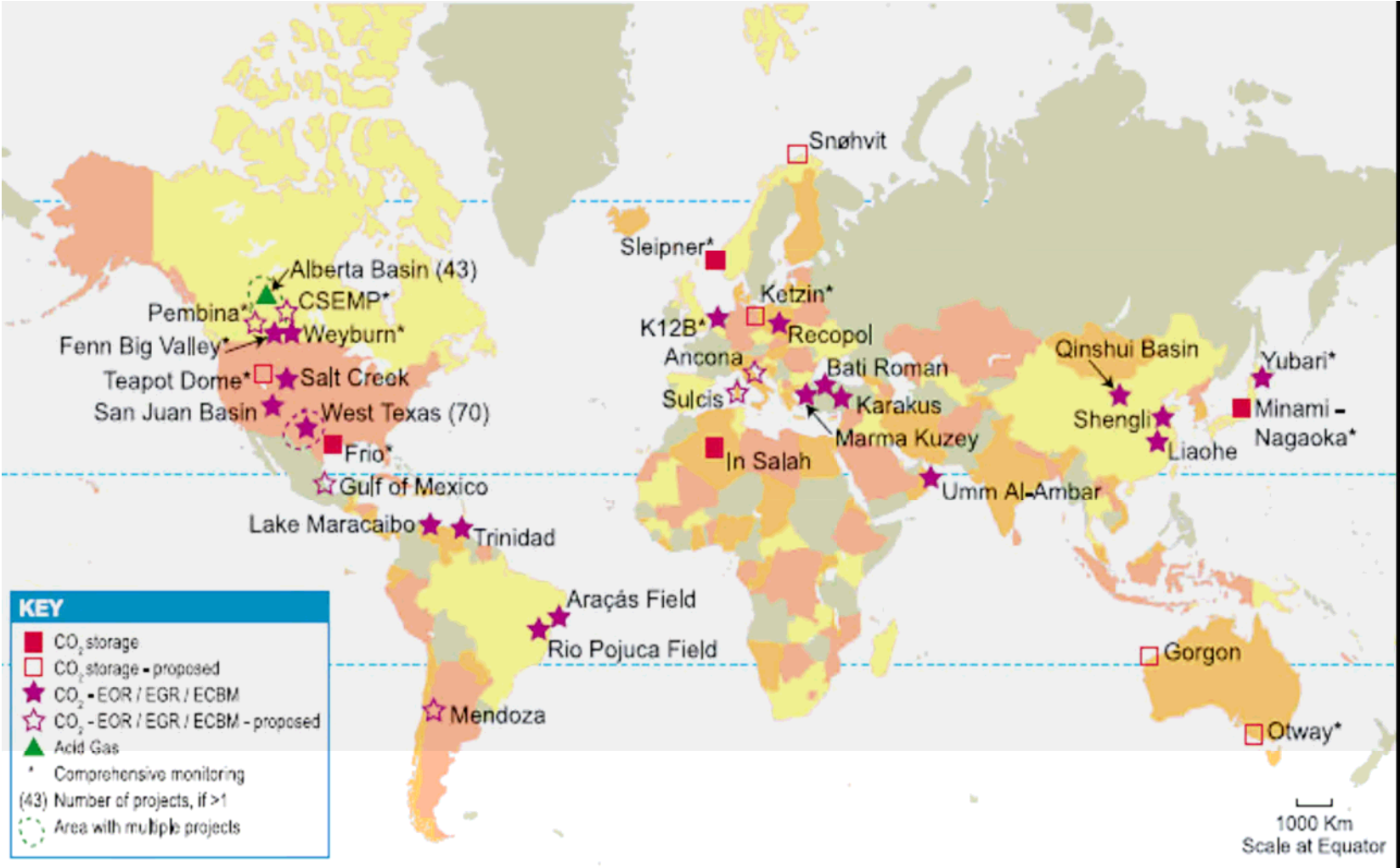
Sleipner Project: 10 years of safe storage!!!!



- The first and till now the only CO₂ geological storage project at commercial level, in a saline aquifer that lies 1.012m beneath the sea surface.
- By the end of the project approximately 20Mt CO₂ are expected to have been stored.



Demonstrative projects of CO₂ storage worldwide





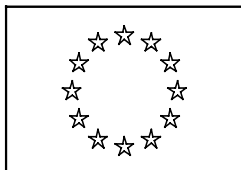
EU initiatives to promote CCS (1)



- Proposal for a Directive on Geological Storage of CO₂
- Strategic Energy Technology Plan for Europe (SET)
- Communication on Supporting early opportunities of Sustainable Power Generation from Fossil Fuels
- Guidelines for State aid to environmental projects
- Proposal for a revised Directive on to improve and extend the EU greenhouse gas emission allowance trading system



EU initiatives to promote CCS (2)



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 23 January 2008

COM(2008) xxx

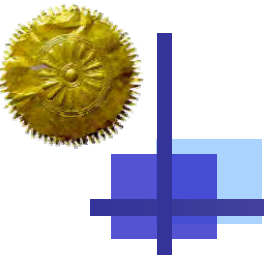
2008/xxxx (COD)

Draft Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

On geological storage of Carbon dioxide

(presented by the Commission)



EU initiatives to promote CCS (3)



- **CO₂ Capture**
 - Regulation under Integrated Pollution Prevention and Control Directive (**IPPC**)
 - **BAT** Reference Document for capture technologies

- **CO₂ Transport**
 - Transport by pipeline: Regulation at Member State level **as for gas transport**
 - Transport by ship: similar approach



EU initiatives to promote CCS (4)



Draft for the CO₂ geological storage directive

- Scope: **Geological storage of CO₂ including enhanced hydrocarbon recovery using CO₂**
- Exploration of storage sites: **Subject to exploration permit to be granted for max. 2 years (after that to be converted into storage permit or relinquished)**
- Characterisation and verification of storage sites: **Characterisation of the storage site and assessment of the expected security through different modelling exercises (Annex I); site should only be selected if assessment shows that there is no significant risk of leakage.**
- Criteria for CO₂ stream: **consist "overwhelmingly" of CO₂**



EU initiatives to promote CCS (5)



Draft for the CO₂ geological storage directive

- Review of draft permit: **MS submit draft permit to EC for review; EC will provide opinion within 6 months; competent authorities have to take EC opinion into account, but final decisions taken by MS**
- Monitoring and reporting obligations: **comparison between actual and modelled behaviour and detection of any leakage/migration/ adverse effects for surrounding environment**
- Inspections: **routine (every 12 months) and non-routine environmental inspections to check compliance with requirements of the Directive**
- Measures in case of leakage: **corrective measures to be taken by the operator (or by the government if operator fails or is unable)**
- Closure of storage sites and after-care: **implement closure plan**



EU initiatives to promote CCS (6)



Draft for the CO₂ geological storage directive

- Transfer of responsibility to the state: **competent authority takes over responsibility including all legal obligations in post-closure phase if all available evidence suggests long-term security of the storage**
- Financial security: **operators should make financial securities regarding closure procedures, post-closure provisions and obligations arising from EU ETS**
- Access to transport and storage network: **should be non-discriminatory, access may be refused under certain conditions**
- Entry into force: **Implementation at national level should be done 1 year after the publication of the Directive.**



EU initiatives to promote CCS (7)



Draft for the CO₂ geological storage directive

Making CCS mandatory:

- **No proposal for making CCS mandatory**
- **But: Capture-ready requirement**
- ***”...all combustion plants...**have** suitable space **on the installation site for the equipment necessary to capture and compress CO₂ and that the availability of suitable storage sites and the technical feasibility of CCS retrofit **have been** assessed”*****
(amendment of Large Combustion Plants (LCP) Directive)



EU initiatives to promote CCS (8)



Draft for the CO₂ geological storage directive

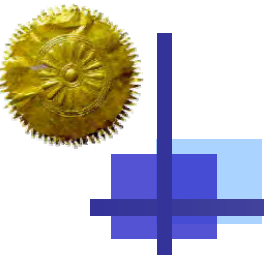
Change of water and waste legislation:

➤ **Water Framework Directive:**

allow for "injection of carbon dioxide streams for storage purposes into geological formations which for natural reasons are permanently unsuitable for other purposes..."

➤ **Waste Framework Directive:**

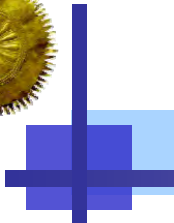
to be excluded from the scope of the Directive is "carbon dioxide captured and transported for the purposes of geological storage..."



EU initiatives to promote CCS (9)



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EU initiatives to promote CCS (10)



COMMISSION OF THE EUROPEAN COMMUNITIES

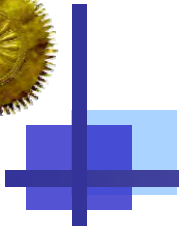
Brussels, 22.11.2007
COM(2007) 723 final

**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE
EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL
COMMITTEE AND THE COMMITTEE OF THE REGIONS**

A EUROPEAN STRATEGIC ENERGY TECHNOLOGY PLAN (SET-PLAN)

'Towards a low carbon future'

The Strategic Energy Technology Plan

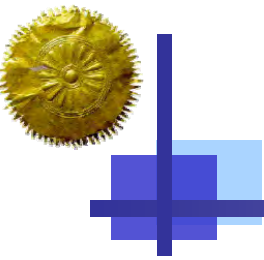


EU initiatives to promote CCS (11)



The Strategic Energy Technology Plan

- **Aim:** better use and increase of resources to accelerate the development and deployment of low-carbon technologies by aligning European, national and industrial activities
- **CCS:** key technology challenge **to reach EU's 2020 target**
- **Initiate transition to low carbon energy network and systems to help develop tools and models for EU level foresight in, among others, CO₂ transport and storage.**



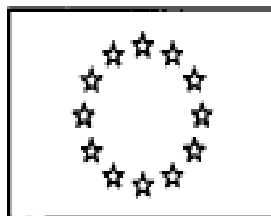
EU initiatives to promote CCS (12)



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EU initiatives to promote CCS (13)



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 23.10.2007
COM(2007)

Draft

**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE
EUROPEAN PARLIAMENT**

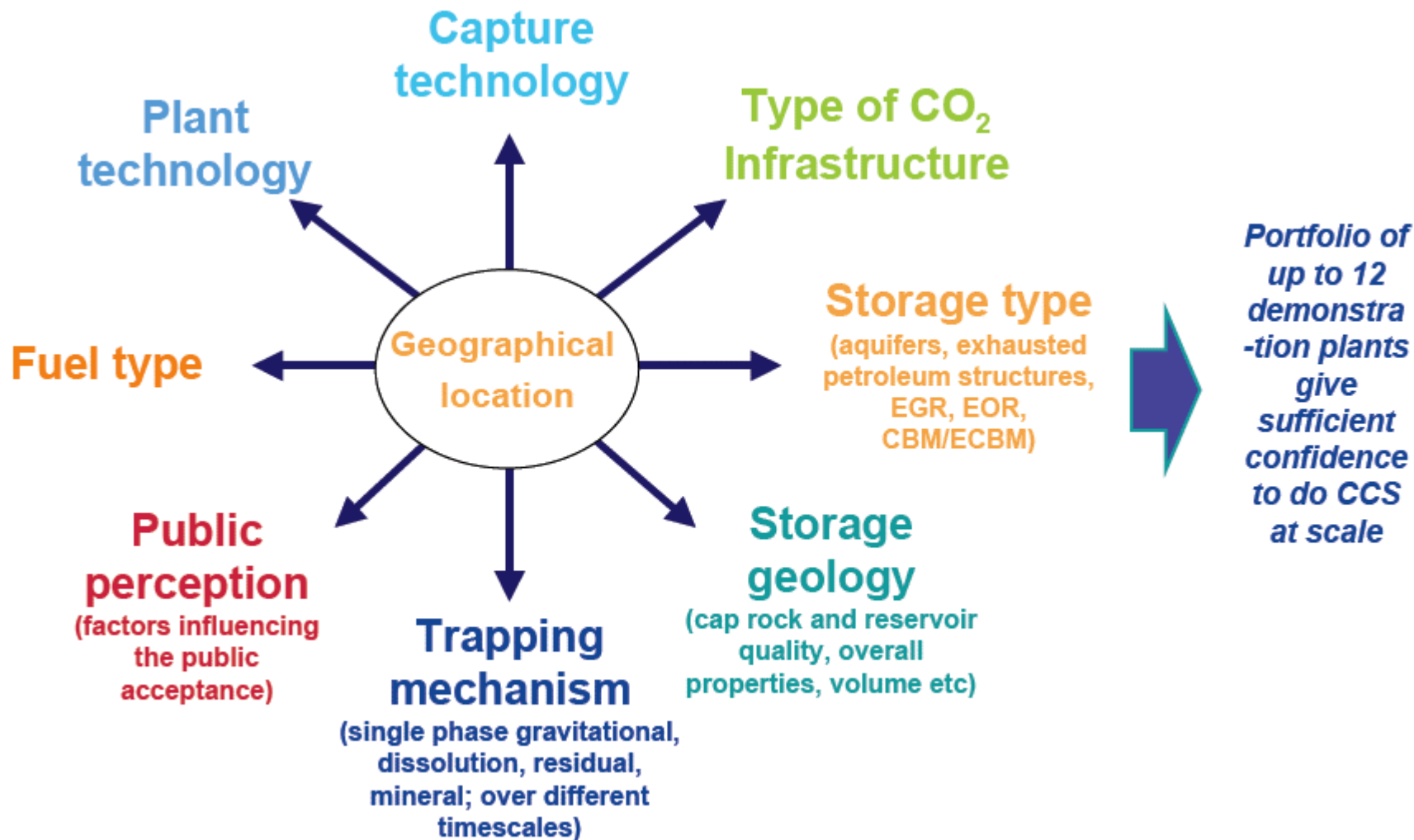
Supporting Early Demonstration of Sustainable Power Generation from Fossil Fuels

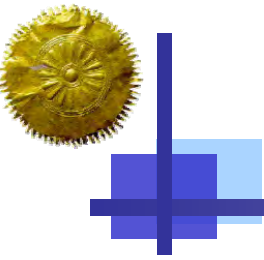


EU initiatives to promote CCS (14)



Why Flagship Program?





EU initiatives to promote CCS (15)



Elements of Flagship Program

Key hurdles to CCS demos at present:

- Regulatory framework
- Completion of technology development (especially for capture)
- Size of each investment
- Increased operating costs
- Missing CO₂ infrastructure



EU initiatives to promote CCS (16)



EU Network of CCS Demonstration Projects

- Member States encouraged to support demonstrations through implementation of incentive measures or providing grants

- Creating a project network as a support action under FP7
 - Coordination, common identity (*European logo*)
 - Exchange of information
 - Collective actions: public acceptance, third countries
 - Selection of projects, information and experience exchange
 - Fast track to State Aid (!)

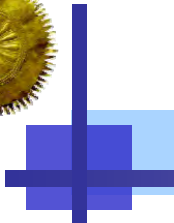


EU initiatives to promote CCS (17)



Main messages

- *”Without bold funding decisions by the companies at the earliest opportunity, complementary public funding may not be triggered”*
- *”Public funding would have to come primarily from Member States.*



EU initiatives to promote CCS (18)



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EU initiatives to promote CCS (19)



Revised state aid guidelines for environmental protection

- Specific reference to CCS demonstration projects – two different possible routes:
 - **Article 87 (3) (c):** for the **facilitation of the** "development of certain economic activities": **Allowance of state aid for up to 60% of the extra investment costs to apply CCS under the relevant project category**
 - **Article 87 (3) (b):** for "important projects of common European interest": **more flexibility** - relation to European project network.



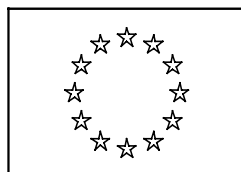
EU initiatives to promote CCS (20)



- Proposal for a Directive on Geological Storage of CO₂
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EU initiatives to promote CCS (21)



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 20 December 2007

COM(2008) xxx

2008/xxxx (COD)

Draft Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

amending Directive 2003/87/EC so as to improve and extend the EU greenhouse gas emission allowance trading system

(presented by the Commission)



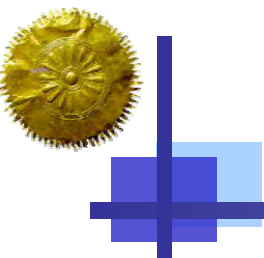
EU initiatives to promote CCS (22)



Proposal for a revised Directive on to improve and extend the EU greenhouse gas emission allowance trading system

- From 2013 onwards, the capture, transport and geological storage of greenhouse gases will be covered by this Directive in a harmonised manner across the Community.

..no free allocation should be given for capture, transport or storage of greenhouse gas emissions



EU initiatives to promote CCS (23)



Auctioning of allowances

- At least [...] % of the revenues generated from the auctioning of allowances shall be used to reduce greenhouse gas emissions and to adapt to the impacts of climate change, to fund the development of renewable energies to meet the EU's commitment to using 20% renewable energies by 2020, for the **capture and geological storage of greenhouse gases** and for measures to avoid deforestation, and to facilitate developing countries' adaptation to the impacts of climate change, in particular Least Developed Countries, and to fund research and development for reducing emissions and adaptation.



EU initiatives to promote CCS (24)



Future Allowance Import Requirement (FAIR)

- **Purpose:** Prevent competitive distortions between EU and third country industries as a result of a more stringent EU ETS
- Applicable from 2015 to goods for which there is "significant risk of carbon leakage" or "international competition" and traded with countries that do not take climate action comparable in the relevant sector to the action taken in the EU.

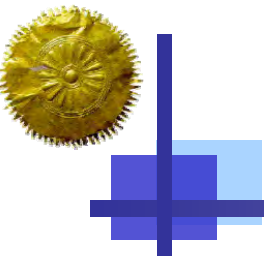


EU initiatives to promote CCS (25)



Future Allowance Import Requirement (FAIR)

- Importers to buy emission allowances (through ETS or Kyoto flex mechs) equivalent to what an average EU producer of the same product would have needed to buy (i.e. FAIR will be calculated based on EU average production technology and adjusted for free emission allowances given to EU producers)
- Conversely, EU exporters will receive ETS allowances (calculated in the same manner as for importers)



Fossil Energy Technology Platform (1)



Scope:

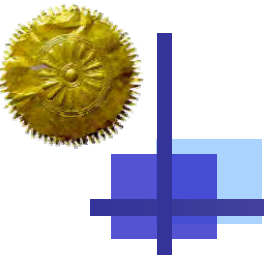
- ✓ The scope of Platform is the conception and formulation of a Strategic Research Agenda aiming at the determination of the research and technological priorities in the Greek energy sector, taking into account the European and international situation. The Platform is one of the Actions (E1) of the Western Macedonia Innovation Pole.

Priorities:

- ✓ Capture and management of CO₂ emissions in the energy sector
- ✓ Measures for conventional emissions (SO_x, NO_x, particulates)
- ✓ Utilization of lignite combustion by-products
- ✓ Introduction of Clean Coal Technologies
- ✓ Combined utilization of fossil fuels and renewable energy sources

Aim:

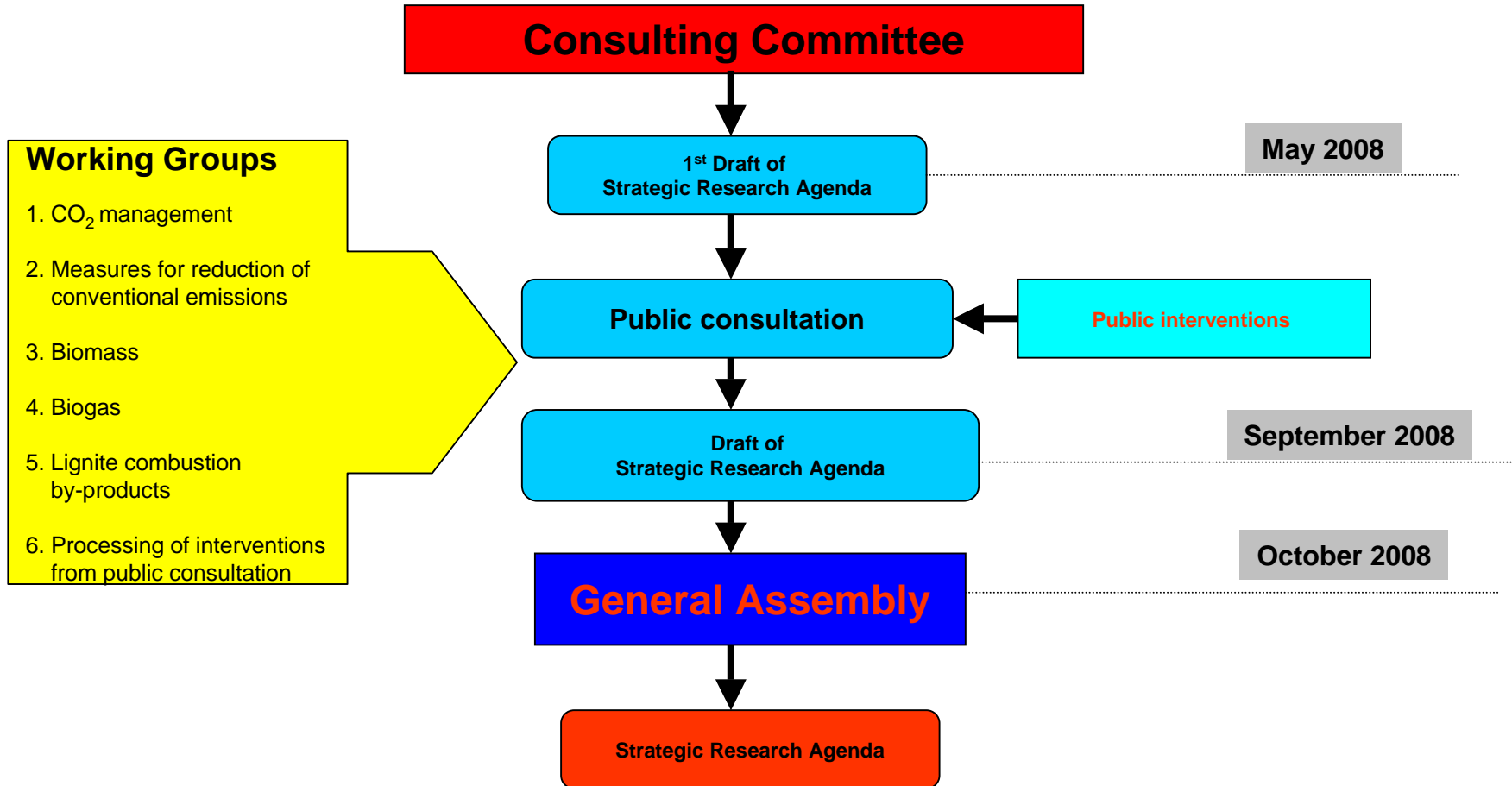
- ✓ In the Medium Term, the Platform will create a timetable of cohesive actions for the promotion of novel, economically viable and environmentally friendly fossil fuel technologies.
- ✓ In the Long Term, the Platform will set the framework for the installation of new zero emission power plants.



Fossil Energy Technology Platform (2)



Methodology of implementation and organization chart



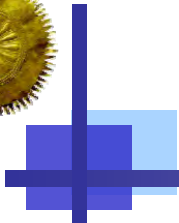


Fossil Energy Technology Platform (3)



Deliverables of the period of reference:

1. Technical report on fossil resources potential in Western Macedonia ✓
2. Technical report on RES potential in Western Macedonia ✓
3. Technical report on the state of the art coal technologies ✓
4. Technologies for thermo-chemical treatment of biomass and de-centralized CHP schemes ✓

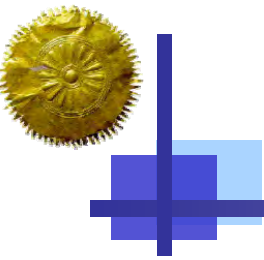


Fossil Energy Technology Platform (4)



Actions of the period of reference:

- Invitation for participation in the Platform
 - through GSRT website, letters to the industrial sector
- Collection and evaluation of CVs
 - 85 CVs were collected, especially from the academic and research field
- Establishment of Consulting Committee
 - Completed
- Establishment of Working Groups
 - Completed
- Main priority axes of the Research Agenda
 - Under development
- Dissemination activities
 - Western Macedonia Innovation Pole and CERTH/ISFTA websites, local press, Athens press, GSRT printed material



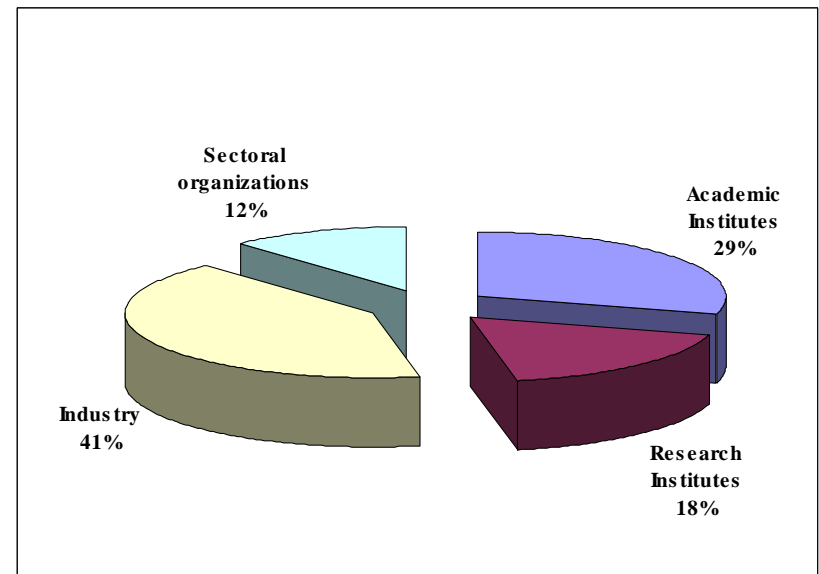
Fossil Energy Technology Platform (5)



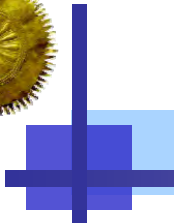
Structure of Consulting Committee

Participating Organizations

- CERTH/ISFTA
- University of Western Macedonia
- Aristotle University of Thessaloniki
- PPC S.A.
- IGME
- TITAN
- ELPE
- AGET
- DIADYMA
- Association of Electricity Companies



Participation percentage of organization representatives in the Consulting Committee



Fossil Energy Technology Platform (6)



Working Groups composition

1. CO₂ Capture and Storage

- CERTH/ISFTA
- TITAN
- AGET
- PPC

2. Biogas Technology

- PanHellenic Association of Chemical Engineers
- Technological Educational Institute of Western Macedonia

3. Conventional emissions abatement

- Western Macedonia pole
- CERTH/ISFTA
- University of Thrace

4. Biomass Technology

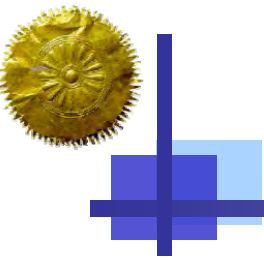
- CERTH/ISFTA
- Aristotle University of Thessaloniki
- University of Crete

5. Ash utilization

- CERTH/ISFTA
- University of Patras

6. Public Consultation Intervention Process

July 2008



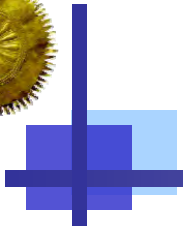
Fossil Energy Technology Platform (7)



Timetable cross-checking

Φάσεις	Διάρκεια (Μήνες)			
	6	12	18	24
1.Αποτίμηση δυναμικού ενεργειακών πόρων Δυτικής Μακεδονίας	*			
1.1 Αποτίμηση δυναμικού ορυκτών πόρων				
1.2 Αποτίμηση δυναμικού ΑΠΕ				
2.Αξιολόγηση ενεργειακών για την Περιφέρεια Δυτικής Μακεδονίας	*			
2.1 Τεχνολογίες αξιοποίησης άνθρακα				
2.2 Τεχνολογίες θερμοχημικής επεξεργασίας βιομάζας και αποκεντρωμένα συστήματα συμπαραγωγής ηλεκτρισμού και θερμότητας				
2.3 Τεχνολογίες παραγωγής και αξιοποίησης βιοαερίου				
3.Περιβαλλοντικές επιπτώσεις ενεργειακών τεχνολογιών - Μέτρα μείωσης	*			
3.1 Μέτρα μείωσης οξειδίων του αζώτου (NOx) σε εγκαταστάσεις άνθρακα				
3.2 Μέτρα μείωσης άλλων ρυπαντών (σωματιδιακή ρύπανση, SO ₂)				
3.3 Μέτρα μείωσης αερίων CO ₂ σε μονάδες παραγωγής ενέργειας ορυκτών καυσίμων				
3.4 Μέτρα μείωσης στερεών ρύπων - Αξιοποίηση παραπροϊόντων καύσης				
4. Καθορισμός προτεραιοτήτων για έρευνα και ανάπτυξη στον τομέα των ενεργειακών τεχνολογιών για την Δυτική Μακεδονία				

* : deliverable



Fossil Energy Technology Platform (8)



Next period's activities planning:

- Completion of the dues that are predicted for the next period
- Meeting of the Consultative Committee, elaboration of the main topics of the Technology Platform
- Meeting for the latest advances of the energy technologies
- Informing activities (through TCG, Industry Federations, specialized magazines etc)



CO₂ geological storage in Greece (1)

Deep saline aquifers	Location	Storage capacity (Mt CO₂)
Prinos	Coastal	1343
W. Thessaloniki	Continental	459
W. Thessaloniki sandstones	Continental	145
Alexandria	Continental	34
Mesohellenic Trough	Continental	360
Total		2345



CO₂ geological storage in Greece (2)



- **Mesohellenic Trough:** is a Tertiary basin that consists of thick layers of conglomerates and sandstones that are estimated to provide the necessary space and impermeability for the storage of large quantities of CO₂.

The tourbiditic sandstones have a porosity of ~15%, while in some samples comes up to 25%. The intermediary shale beds can provide the impermeability needed.

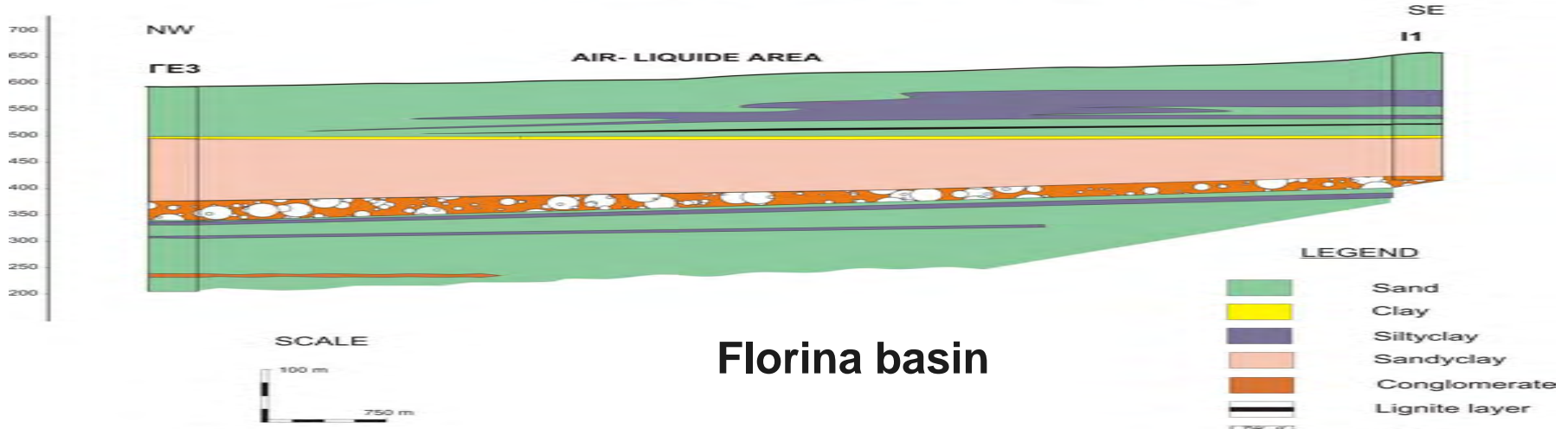
Advantage: In vicinity of the lignite power stations in Ptolemais – Kozani.

- **Thessaloniki basin:** a Tertiary basin that consists of thick sedimentary layers with a sufficient volume for the storage of large quantities of CO₂ from the near emission sources (refineries, cement and fertilizer industry).

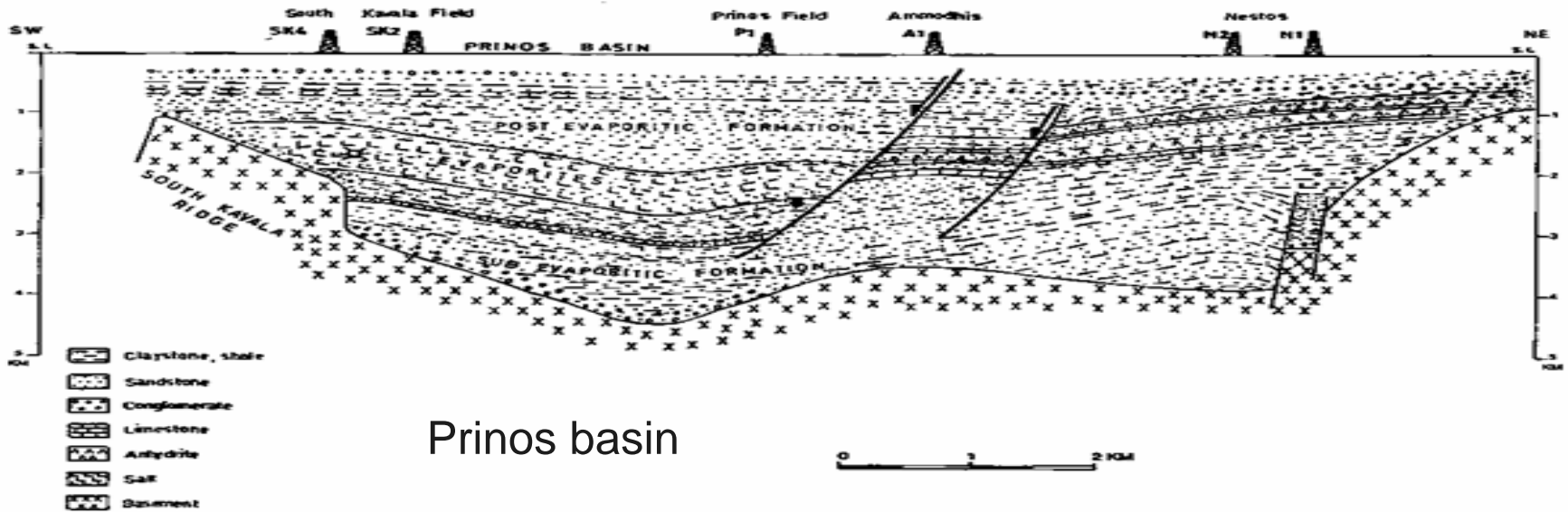


CO₂ geological storage in Greece (3)

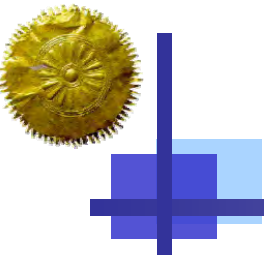
GEOLOGICAL SECTION THROUGH BEROHOLES ΓΕ3 - Ι1



Florina basin



Prinos basin



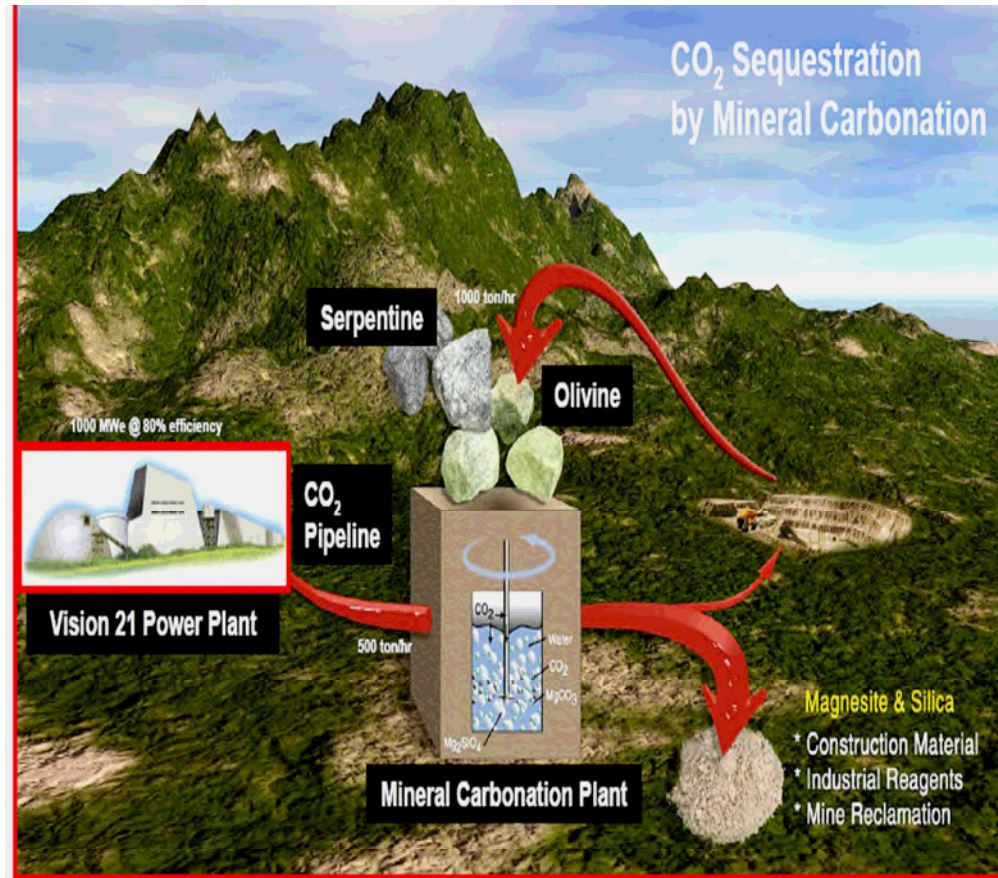
CO₂ geological storage in Greece (4)

Mineral carbonation: reaction of CO₂ with metal oxide bearing materials to form insoluble carbonates, with calcium and magnesium being the most attractive metals.

The general reaction is:



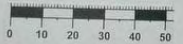
M: divalent ion. Here, M corresponds to Ca or Mg



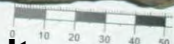


CO₂ geological storage in Greece (5)

Pyroxenite



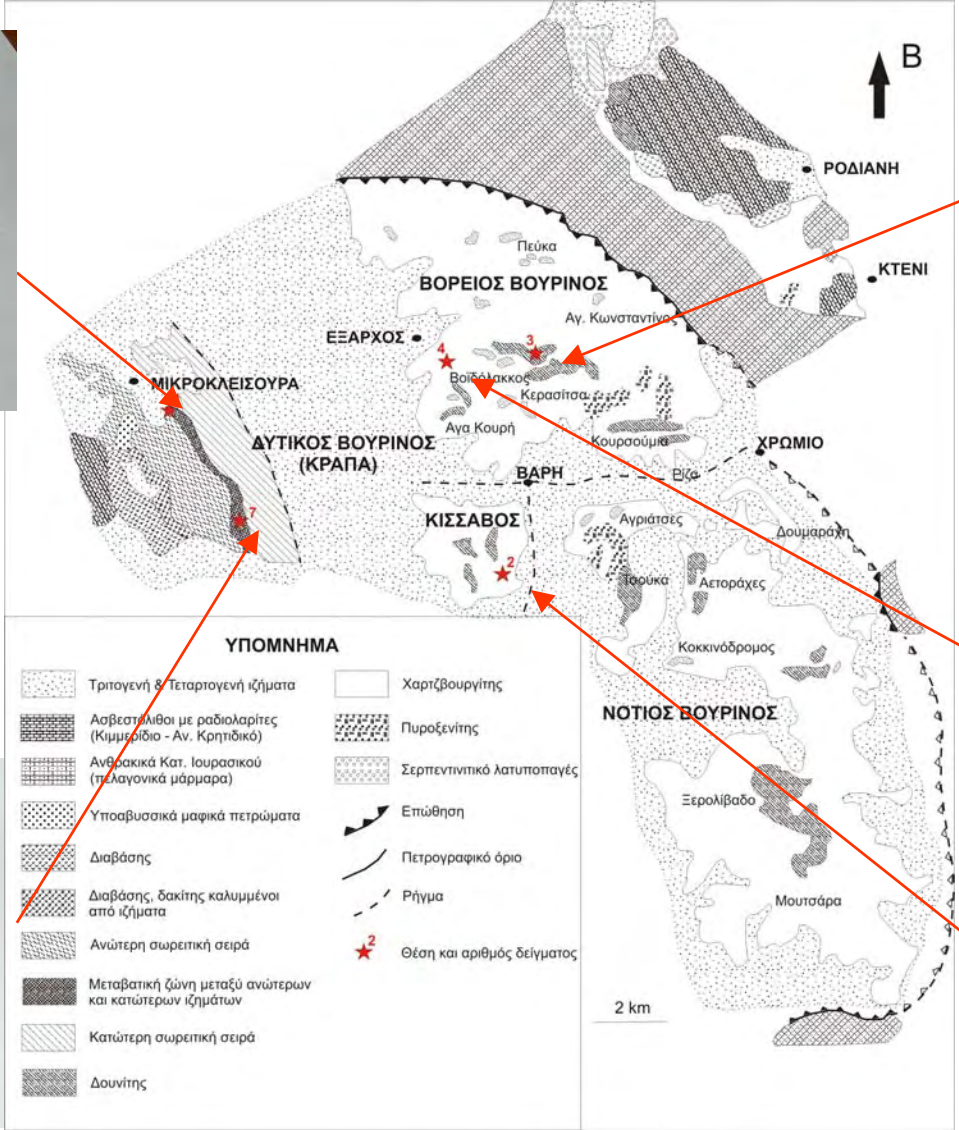
Dunite

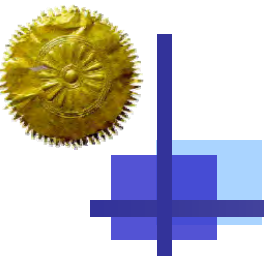


Hartzburgite



Hartzburgite





CO₂ geological storage in Greece (6)

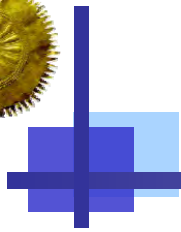
Experiment conditions:

Sample	Weight before the mineralization (gr)	Weight after the mineralization(gr)
S1	85,033	82,890
S2	83,427	85,766
S3	85,000	85,950
S4	84,429	87,950
S7	85,009	88,560

- a) Duration: about 3 – 4 hours
- b) Pressure inside autoclave: 2300psi
- c) Temperature: 155°C
- d) Stirring velocity: 900rpm (average)



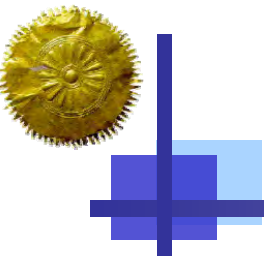
Autoclave



Conclusions (1)

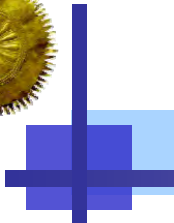


- The development of the ETP ZEP proves the readiness of the research community, the industry and all the other partners involved for the development of a common vision and the elaboration of a common route in order to accomplish power generation from zero emission fossil fuels by 2020.
- That will be equivalent to gradual reduction of the CO₂ emissions from power generation to 60%, starting today and till 2050.
- EU accepts the contribution of fossil fuels, particularly of coal, to the security and differentiation of the energy supply in European and global level, with a way that is compatible to the targets of the strategy made for sustainable development and the policy for climate change.
- CCS and “clean coal” are included in the FP7 budget for the energy that is estimated at 2.350 millions of Euro for the period 2007 – 2013.



Conclusions (2)

- A large number of projects has been announced at global level for the research, development, demonstration and exploitation of CCS technologies.
- The establishment of a regulation frame, at European level, will contribute to the lifting of unjustifiable barriers to the promotion of specific technologies as well as to the insurance of a secure and reliable CCS application, from an environmental point of view.
- Future ETS will provide the basic motives through stable and powerful prices of the CO₂ emission right.
- Despite the presence and the daring initiative of ZEP TP, the successful and prompt demonstration of the commercial viability of the sustainable fossil fuels demands the creation of a structure for the co-ordination and the adequate support of technological demonstrations for the CCS technologies, at industrial level.
- There is not enough time The undertaking of actions for the development and verification of CCS technologies (Flagship Program) is considered to be of high priority.



Thank you for your attention...

