CGS Europe
Pan-European coordination action on CO$_2$
Geological Storage
(Coordination and support action)

THEME [ENERGY.2010.5.2-2]
[Trans-national cooperation and networking in the field of geological storage of CO$_2$]
OUTLINE

- Why CO$_2$ must be controlled? Primary ways to control CO$_2$ in the atmosphere.
- EU Project « CGS EUROPE»
  - Goal
  - Strategy
  - Workplan
  - Work packages
  - Meetings organised
  - Publications
  - Expected internal and external impacts
Climate Change and its effect on life on earth had challenged the scientists and industry to come up with ideas to combat this problem by decreasing and/or eliminating CO$_2$ which results from human activities,

*Reduction in CO$_2$ emitted to atmosphere is main target in this war.*

It is accepted that in industrial applications the first route is to:
- Increase efficiency (about 50% reduction is expected),
- The next high reduction (~ 20 %) is anticipated to come from CO$_2$ capture and storage, CCS.
CO$_2$ Capture and Storage has 3 main phases:

- Application of technology to capture CO$_2$ from flue gases of industrial plants/power plants

- Transport of captured CO$_2$ by pipeline, road tankers, sea tankers to storage sites,

- Injection of CO$_2$ to underground geological storage sites, deep into earth and then monitoring for the leaks to make sure that CO2 stays underground.
Capture technology had become mature enough to be applied to power plants and other industrial sites.

The challenge is now in the geological storage, do we have enough storage capacity? Can we couple emission points with storage sites?
The present project:

CGS Europe « Pan European Coordination Action on CO$_2$ Geological Storage »

is designed so that EU and Associate Country representatives will share knowledge and initiate new projects on CO$_2$ storage.
Objective

To build a credible, independent and representative scientific body of expertise on CO\textsubscript{2} geological storage that will:

- Create a durable network of research capacity
- Coordinate its activities with other stakeholders, including the ZEP Technology Platform
- Help reduce the existing gap between the ‘forerunner’ countries, and the ‘follower’ countries
- Contribute to the large-scale demonstration and industrial deployment of CCS
- Support the implementation of the EU Directive on the geological storage of CO\textsubscript{2} and other regulatory regimes
European Scientific Expertise on CO$_2$ Geological Storage

Started with CO$_2$GeoNet in 2004

CGS Europe this pooling will enlarge to the whole of Europe through collaboration with key geoscientific institutes from:

- **CO2NET EAST** – Coordination Action on CCS (2006-2010), involving 7 R&D institutions representing 5 new EU Member States and 2 Associated Countries

- **ENeRG** – European Network for Research in Geo-Energy, created in 1993, 60 members from 28 countries

- **EuroGeoSurveys** – European Association of national geological surveys
Created as a FP6 Network of Excellence in 2004
Transformed into a non profit Scientific Association under French law in 2008

As an independent and multidisciplinary scientific body, CO2GeoNet has the key role of building trust on CO2 geological storage and supporting wide scale CCS implementation
CGS Europe

Project duration
3 years (November 2010 – October 2013)

Partnership
34 research institutes from 28 countries (24 EU Member States and 4 Associated Countries)

Coordinator
BRGM – Isabelle Czernichowski Lauriol
Project Consortium – Goals for Creation:

- Provide wide geographical coverage by including most European countries
  - the consortium covers most of Europe and specifically includes those countries with the main potential for storage, although not exclusively so
- Bring together key research institutes, leaders in CO\textsubscript{2} storage research and newcomers, actors on national and international level
  - all the participants of the consortium are research-oriented institutions and represent in their country an independent body of expertise on CO\textsubscript{2} geological storage
- Pool expertise from all over Europe
  - each institute brings into the consortium both a developed knowledge of the local geology, together with the national CCS context, and a specific expertise in certain aspects of CO\textsubscript{2} geological storage
# List of Participants

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Short name</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BUREAU DE RECHERCHES GÉOLOGIQUES ET MINIERES</td>
<td>BRGM</td>
<td>France</td>
</tr>
<tr>
<td>2</td>
<td>CO2GEONET - RESEAU D’EXCELLENCE EUROPEEN SUR LE STOCKAGE GÉOLOGIQUE DE CO2</td>
<td>CO2GeoNet</td>
<td>France</td>
</tr>
<tr>
<td>3</td>
<td>BUNDESANSTALT FUR GEOWISSENSCHAFTENUND ROHSTOFFE</td>
<td>BGR</td>
<td>Germany</td>
</tr>
<tr>
<td>4</td>
<td>GEOLOGISCHE BUNDESANSTALT</td>
<td>GBA</td>
<td>Austria</td>
</tr>
<tr>
<td>5</td>
<td>INSTITUT ROYAL DES SCIENCES NATURELLES DE BELGIQUE</td>
<td>RBINS-GSB</td>
<td>Belgium</td>
</tr>
<tr>
<td>6</td>
<td>SOFIISKI UNIVERSITET SVETI KLIMENT OHRIDSKI</td>
<td>SU</td>
<td>Bulgaria</td>
</tr>
<tr>
<td>7</td>
<td>CESKA GEOLOGICKA SLUZBA</td>
<td>CzGS</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>8</td>
<td>TALLINNA TEHNIKAULIKOOL</td>
<td>TTUGI</td>
<td>Estonia</td>
</tr>
<tr>
<td>9</td>
<td>GEOLOGIAN TUTKIMUSKESKUS</td>
<td>GTK</td>
<td>Finland</td>
</tr>
<tr>
<td>10</td>
<td>INSTITUTO GEOLOGIKON KAI METALLEYTIKON EREYNON</td>
<td>G-IGME</td>
<td>Greece</td>
</tr>
<tr>
<td>11</td>
<td>MAGYAR ALLAMI EOTVOS LORAND GEOFIZIKAI INTEZET</td>
<td>ELGI</td>
<td>Hungary</td>
</tr>
<tr>
<td>12</td>
<td>Department of Communications, Energy and Natural resources</td>
<td>GSI</td>
<td>Ireland</td>
</tr>
<tr>
<td>13</td>
<td>LATVIJAS VIDIS, GEOLOGIJAS UN METEOROLOGIJAS CENTRS SIA</td>
<td>LEGMC</td>
<td>Latvia</td>
</tr>
<tr>
<td>14</td>
<td>Gamtos tyrimų centras</td>
<td>GTC</td>
<td>Lithuania</td>
</tr>
<tr>
<td>15</td>
<td>PANSTWOWY INSTYTUT GEOLOGICZNY - PANSTWOWY INSTYTUT BADAWCZY</td>
<td>PGI-NRI</td>
<td>Poland</td>
</tr>
<tr>
<td>16</td>
<td>Laboratorio Nacional de Energia e Geologia I.P.</td>
<td>LNEG</td>
<td>Portugal</td>
</tr>
<tr>
<td>17</td>
<td>INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU GEOLOGIE SI GEOECOLOGIE MARINA-GEOECOMAR</td>
<td>GEOECOMAR</td>
<td>Romania</td>
</tr>
<tr>
<td>18</td>
<td>STATNY GEOLOGICKÝ USTAV DIONYZA STURA</td>
<td>SGUDS</td>
<td>Slovakia</td>
</tr>
<tr>
<td>19</td>
<td>GEOINZENIRING DRUZBA ZA GEOLOSKI INZENIRING DOO</td>
<td>GEO-INZ</td>
<td>Slovenia</td>
</tr>
<tr>
<td>20</td>
<td>INSTITUTO GEOLOGICO Y MINERO DE ESPAÑA</td>
<td>S-IGME</td>
<td>Spain</td>
</tr>
<tr>
<td>21</td>
<td>SVERIGES GEOLOGISKA UNDERSOKNING</td>
<td>SGU</td>
<td>Sweden</td>
</tr>
<tr>
<td>22</td>
<td>University of Zagreb, Faculty of Mining, Geology and Petroleum Engineering</td>
<td>UNIZG-RGNF</td>
<td>Croatia</td>
</tr>
<tr>
<td>23</td>
<td>MIDDLE EAST TECHNICAL UNIVERSITY</td>
<td>METU-PAL</td>
<td>Turkey</td>
</tr>
<tr>
<td>24</td>
<td>FACULTY OF ECOLOGY AND ENVIRONMENTAL SCIENCES</td>
<td>UB</td>
<td>Serbia</td>
</tr>
</tbody>
</table>
Focus on knowledge management:

- **Knowledge Repository**: collect, structure, summarize knowledge for easy use

- **Knowledge Development**: joint research through alignment of institutes’ research programmes and external support, knowledge-sharing workshops, staff-exchange programmes

- **Knowledge Dissemination**: Annual Open Forum, CO₂ storage awareness-raising workshops, CO₂ Storage Spring Schools, Brochures, a central website with links to national websites
Work Plan Organisation

Diagram:

- WP1 Management
- WP2 Integration and Networking
- WP3 Knowledge Repository
- WP4 Knowledge Development
- WP5 Knowledge Dissemination

Stakeholders at national, European and International level
Organisational Structure

General Assembly
High-level representatives from all participants

Advisory Body
Representatives of key initiatives on CCS

Management Body
Coordinator
WP Leaders

Administrative support team
- CO2GeoNet Secretariat
- BRGM legal, financial and administrative staff

European Commission

WP1 Leader: CO2GeoNet-BRGM France (Coordinator)
“Management”

WP2 Leader: CO2GeoNet-BRGM France (Coordinator)
“Integration and Networking”

WP3 Leader: CO2GeoNet-Imperial UK
“Knowledge Repository”

WP4 Leader: IGME Spain
“Knowledge Development”

WP5 Leader: CGS Czech Rep.
“Knowledge Dissemination”
WP1 - Management

Leader: BRGM, France

Main objective:
- to execute the operational, legal, financial and administrative management of the CGS Europe consortium

Management Board:
- Isabelle Czernichowski-Lauriol (BRGM)
- Anna Korre (CO2GeoNet – Imperial)
- Roberto Martinez Orio (S-IGME)
- Vit Hladik (CzGS)
WP2 – Integration and Networking

Leader: **BRGM**, France

Objectives:

- to encourage and support each participant to **work together** in order to build a scientific body of expertise on CO₂ geological storage,
- to **develop networking activities between CGS Europe and external bodies** and establish initiatives that will last beyond the end of the EC contract,
- to search for external funding opportunities in order to expand activities, **prepare for self-financing** after the end of the project period.
WP3 – Knowledge Repository

Leader: CO2GeoNet-IMPERIAL, UK

The objective is to produce CO$_2$-storage-related information

Main activities:

• Development of knowledge repository database
• Produce key summary reports on:
  ➢ Monitoring methods
  ➢ Storage site selection methodologies and requirements
  ➢ Regulatory regimes related to operational and safety risks
WP4 – Knowledge Development

Leader: IGME, Spain

Objectives:
• to encourage **sharing of knowledge** by organising:
  ➢ workshops for geoscientists
  ➢ workshops for other stakeholders
• to **coordinate research** activities between the CGS Europe participants by promoting scientist exchange between partners
• to favour the emergence of **new** targeted research **projects**
WP5 – Knowledge Dissemination

Leader: **Czech Geological Survey**, Czech Republic

Objectives:

- to stimulate **knowledge transfer** and information dissemination
- to **raise** general **awareness** of CCS as a climate change mitigation measure
- to facilitate the implementation of the **European Industrial Initiative** on CCS mentioned in the SET plan
- to support implementation of the **EU Directive** on the geological storage of carbon dioxide
WP5 – Knowledge Dissemination

Main activities:
• Project website www.cgseurope.net
Knowledge Dissemination

- Venice Open Forum (every year)
- Knowledge dissemination workshops & planned
- CCS awareness raising workshops (3 planned)
- Spring School on CO2 storage (2 planned)
Annual Open Forum
May 2011 Venice
April 2012 Venice
Workshops

CGS knowledge-dissemination

- Denmark / Norway (Copenhagen) – organised on 12-13 December 2011
- Spain (Madrid) – Spring 2012
- Italy (Rome) – Autumn 2012
- France (Lorraine) – postponed to 2013
- Greece (Athens) – postponed to 2013
- Finland (Espoo) – 2013
Workshops

CCS awareness-raising workshops
First workshop 13-14 April 2011, Vilnius, Lithuania
CCS Awareness-raising workshops

Second workshop 13-14 June 2012
Ankara TURKEY,
Middle East Technical University
Third awareness raising workshop will be in Bulgaria, June 2013
CGS Europe Spring School on CO₂ geological storage

March 12–18, 2012
at Leszcze near Bełchatów, Poland

19 participants from 11 countries
Second Spring School on CO$_2$ storage

Next Spring School 2013, probably in March in Romania hosted by GeoEcoMar
CO₂GeoNet Educational Brochures

- 13 additional language versions
Several papers and leaflets were prepared to introduce the project at different meetings or as information to media.
Interaction with media

Communications workshop
Brussels 22-23 Sept. 2011
Expected Impacts on Stakeholders

- R&D projects
- Demonstration projects
- Scientific community

CGS Europe

R&D needs, support to implementation, improved trans-EU R&D

EC

Regulators

Scientific community

Structured and shared knowledge, consensus building
Expertise, good practices, knowledge transfer

Industry

Structured and shared knowledge, consensus building

Media

General Public

Impartial information, website

International and Member State Initiatives

Results

Experience

Existing knowledge
Expected Internal Impacts

- Knowledge-sharing workshops help establishment of true networking and integration.
- Staff-exchange programmes increase the mobility of personnel within the EU, and integration of the CCS research community will be possible.
- Promotion of new research projects by complementing demonstration projects within the SET Plan.
- It is expected that project partners will plan their internal research in a more effective way so that research resources across the EU are used more effectively.
Expected External Impacts

- Provide a structured view and access to the available knowledge on CO₂ Geological storage
- Support the implementation of the European Industrial Initiative on CCS
- To become an independent reference point on geological storage issues for European stakeholders
- Being a reference body where the national regulators can seek external unbiased expertise
- Preparing documents for the stakeholders, as well as understandable material targeted at the general public
- Disseminating reliable information towards the media and the general public.
This workshop is sponsored by **Turkish Chamber of Petroleum Engineers**, we thank for their support.

I want to extend my appreciation to the **organizing committee**

*Ilhan Topkaya*
*Çağlar Sınayuğç*
*Vit Hladik*
*Mahmut Parlaktuna*

And to my **young colleagues**, without their help this workshop will not be possible.

*Sevtaç Bülbüł, Gizem Gül, Merve Turanlı, Oytun Örs, Hatice Adalan*
Thank you