LEGAL AND REGULATORY ISSUES FOR THE IMPLEMENTATION OF THE EU DIRECTIVE ON THE GEOLOGICAL STORAGE OF CO_2

1st CGS EUROPE KNOWLEDGE SHARING WORKSHOP

WP4.2

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Workshop Scientific Committee

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Overview of the national CCS regulatory developments in the CGS Europe countries: progress and problems

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INTRODUCTION

- Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide was published in the Official Journal of the European Union on 5 June 2009, and entered into force on 25 June 2009.
- This directive established a legal framework for the environmentally safe geological storage of carbon dioxide (CO2) to contribute to the fight against climate change.
- In the article 39 „Transposition and transitional measures“ it is stated that „Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by **25 June 2011**“,
- that they „shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive“
- and they „shall ensure“ that the storage sites „are operated in accordance with the requirements of this Directive by **25 June 2012**“.

INTRODUCTION

- Recent developments in the Emissions Trading Scheme (ETS) rules bring about two important changes: CO_2 captured and reliably stored can now be considered as not emitted and, after 2013, stronger economic incentives will exist for industrial operators to prefer low-emission technologies.

- The EU Emissions Trading Directive and the CCS Directive both provide a strong legal backbone to facilitate the development of CCS, allowing both private and public money to be invested in order to build large-scale projects that will prove the viability of the technology. These laws will help (i) boost research and innovation, (ii) accelerate the deployment of technology and (iii) define clear targets in order to achieve a coming together of political and commercial objectives.

- The CCS Directive in particular addresses the risk management associated with this technology, such as the removal of barriers to CCS in existing national legislation, the regulation of the long-term liability for CCS storage sites, the inclusion of CCS in the Emissions Trading Scheme, and the improvement of communication about CCS to the public and stakeholders.

- **Source of information:**
  http://www.zeroemissionsplatform.eu/policy-and-regulation.html

INTRODUCTION

- ***The Directorate-General for Climate Action has established an Information Exchange Group in order to organise an exchange of information between the competent authorities of the Member States and promote a coherent implementation of the CCS Directive throughout the European Union. It has also prepared a set of guidance documents to assist stakeholders.***
- *The DG Climate Action of the European Commission has issued four guidance documents to support coherent implementation of Directive 2009/31/EC on the geological storage of carbon dioxide ("CCS Directive") across EU Member States.*
- *The four guidance documents, mainly addressed to competent authorities and relevant stakeholders, elaborate on key provisions of the CCS Directive:*
- *Guidance document 1. CO2 Storage Life Cycle Risk Management Framework*
- *Guidance document 2 Characterisation of the Storage Complex, CO2 Stream Composition, Monitoring and Corrective Measures*
- *Guidance Document 3 Criteria for Transfer of Responsibility to the Competent Authority*
- *Guidance Document 4 Financial Security (Art. 19) and Financial Mechanism (Art. 20)*

- *These documents have been discussed with experts from Member States and key stakeholders, including industry, research community and NGOs.*

What we knew in Venice from EC
(represented by Martina Doppelhammer)

EC supports in the area of CCS directive transposition:

- Consultations and advice to MS through guidance documents, meetings with MS representatives and answers to questions via e-mail
- More active and wider participation of MS in the seminars in Brussels
- Meeting of deadline (25th June)

What we knew in Venice from EC

- Member states without storage capacity are not obliged to transpose directive (at least its geological part)
- but they have to explain to EC their geological reasons

- The countries have rights to forbid CGS in their countries without explanation

What we knew in Venice from EC

How EC will react on not meeting deadline for transposition:

- EC will monitor transposition closely and take appropriate measures to ensure transposition in national legislation, including as appropriate infringement proceedings
- Look at: http://ec.europa.eu/information_society/policy/ecomm/implementation_enforcement/infringement/index_en.htm
- http://ec.europa.eu/information_society/policy/ecomm/implementation_enforcement/infringement/index_en.htm

INTRODUCTION

- At the present time situation with transposition of the CCS Directive is very different in European Countries, often complicated by different
  - political
  - national
  - economical problems
  - different geological conditions
  - and absent public awareness and acceptance of CCS

INTRODUCTION

Data shown in this presentation were collected *were collected using Questionnaire compiled by the Workshop Scientific Committee.*

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- George Hatziyannis (IGME, Greece)
- Sergio Persoglia (OGS, Italy)

Situation was monitored two times : *by end January 2011 and end of April 2011*

List of Participants

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

30 European Countries Involved

- 30 institutions from 28 European countries participating in CGS Europe project took part in the research. Information for Switzerland and Iceland (do not participating in CGS Europe) were taken from published sources. Altogether 30 European countries are covered.

Other Information Sources

- Data for Switzerland is taken from

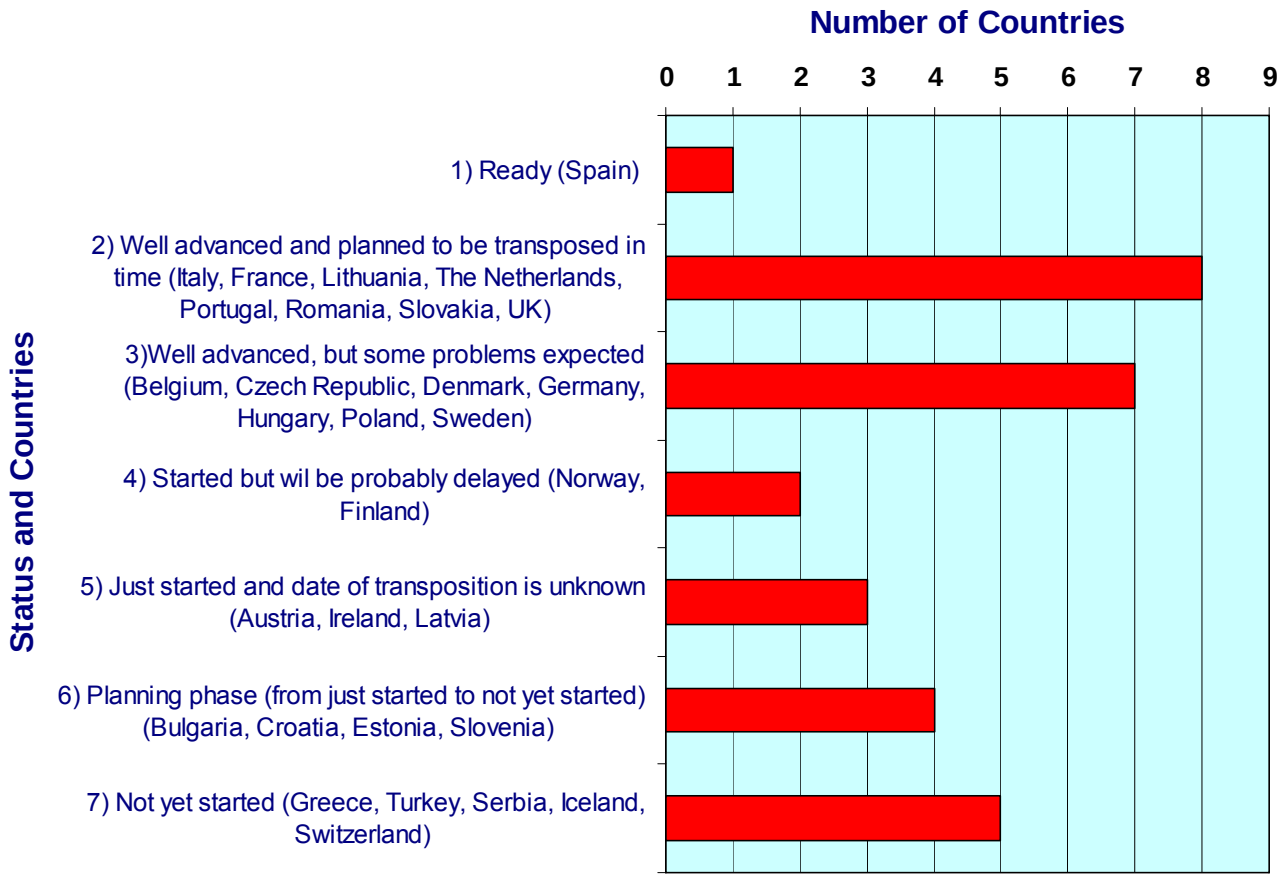
  IEA Report (October 2010)

  Carbon Capture and Storage

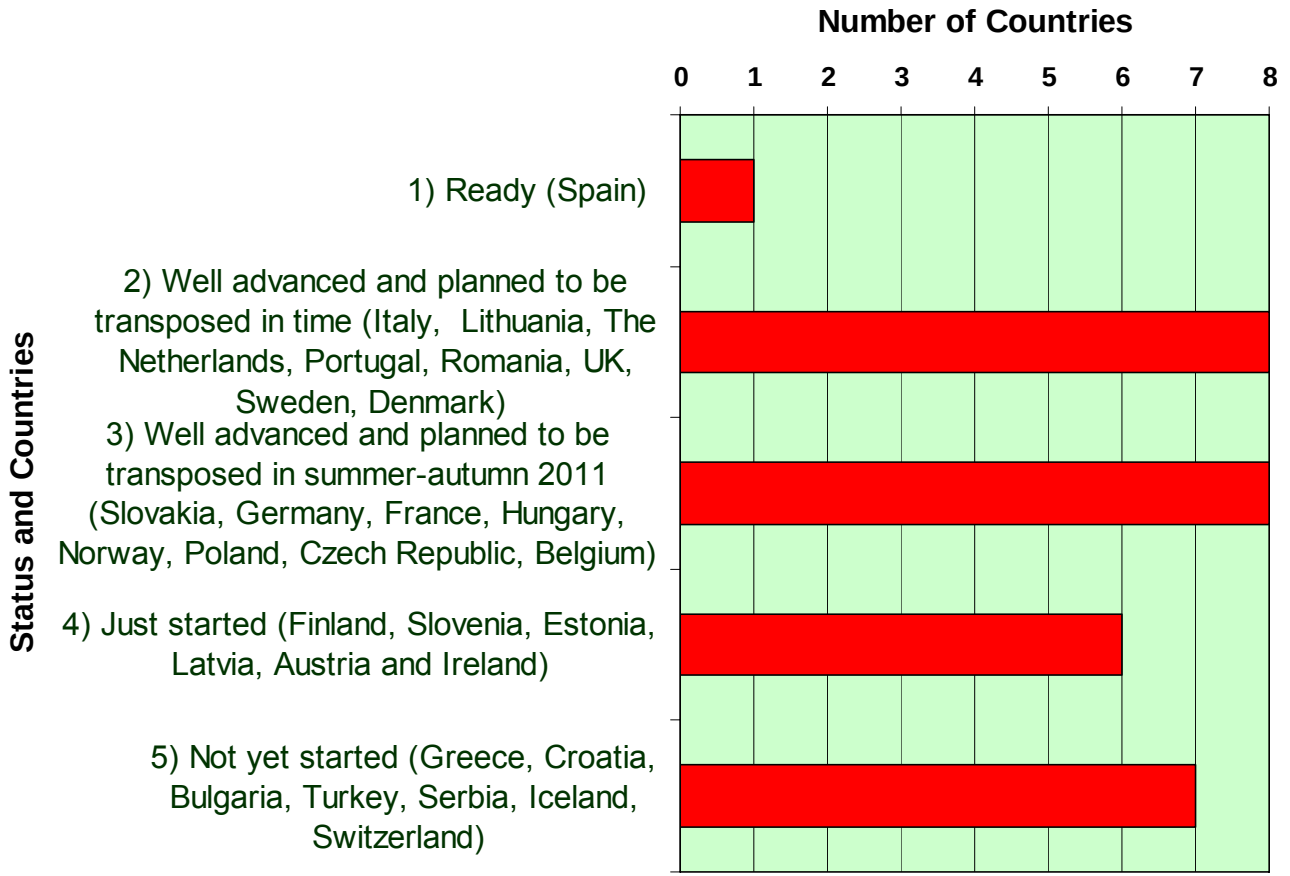
  Legal and Regulatory Review (Edition 1)

- Data for Iceland: Teir S. Et al. 2010. Potential for Carbon capture and storage (CCS) in the Nordic Region. VTT publication, 223 pp.

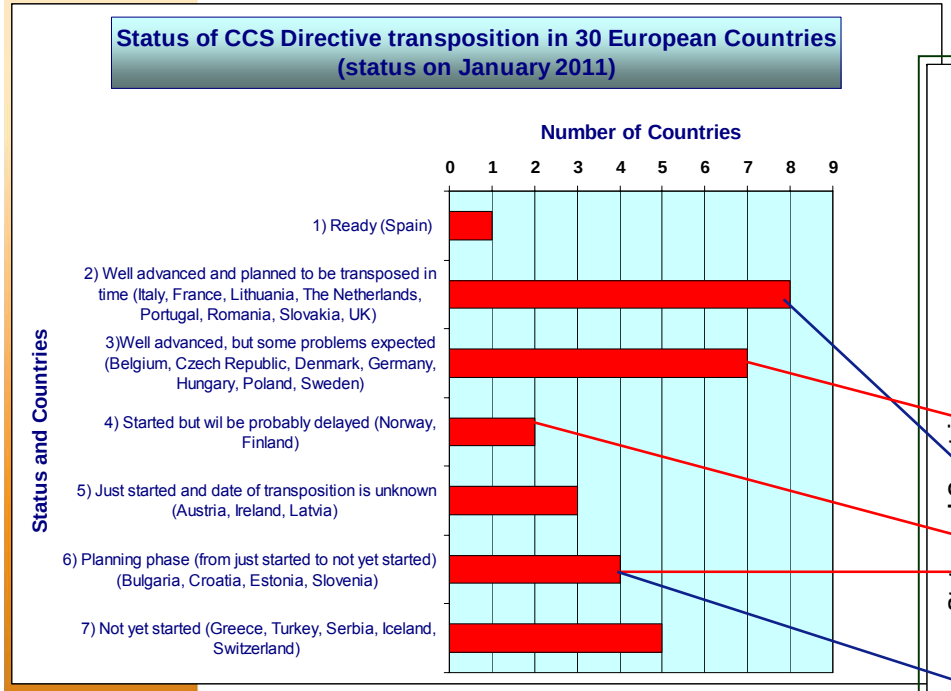
Status of CCS Directive transposition in 30 European Countries (status on January 2011)

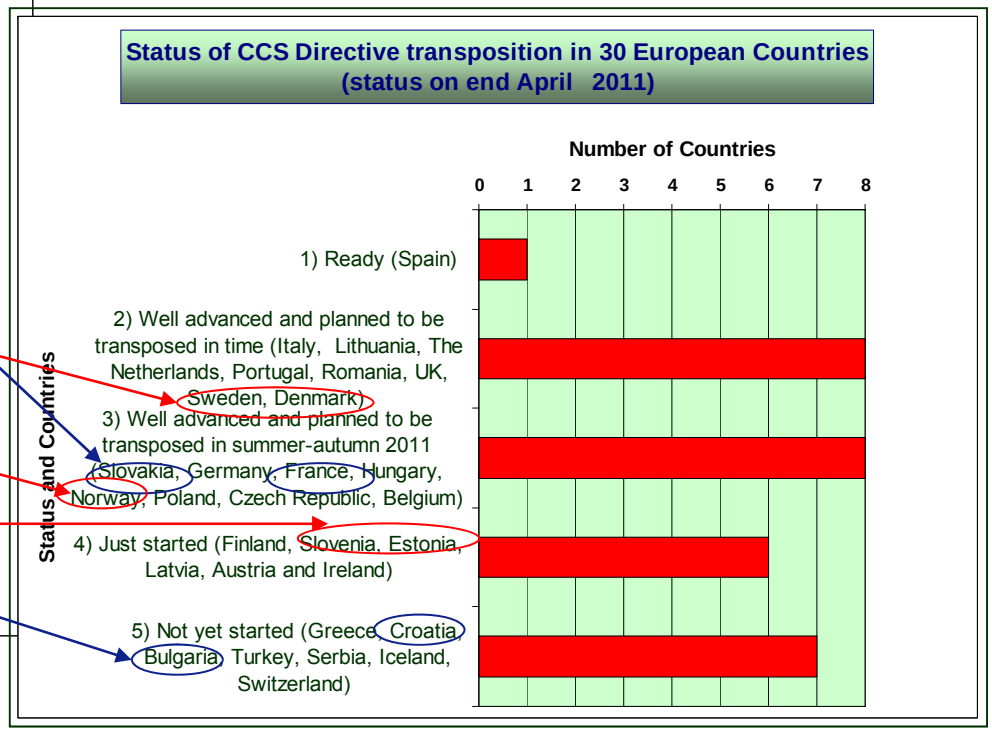


Status of CCS Directive transposition in 30 European Countries (status on end April 2011)



Progress in CCS legislation process during 3 months (February-April)





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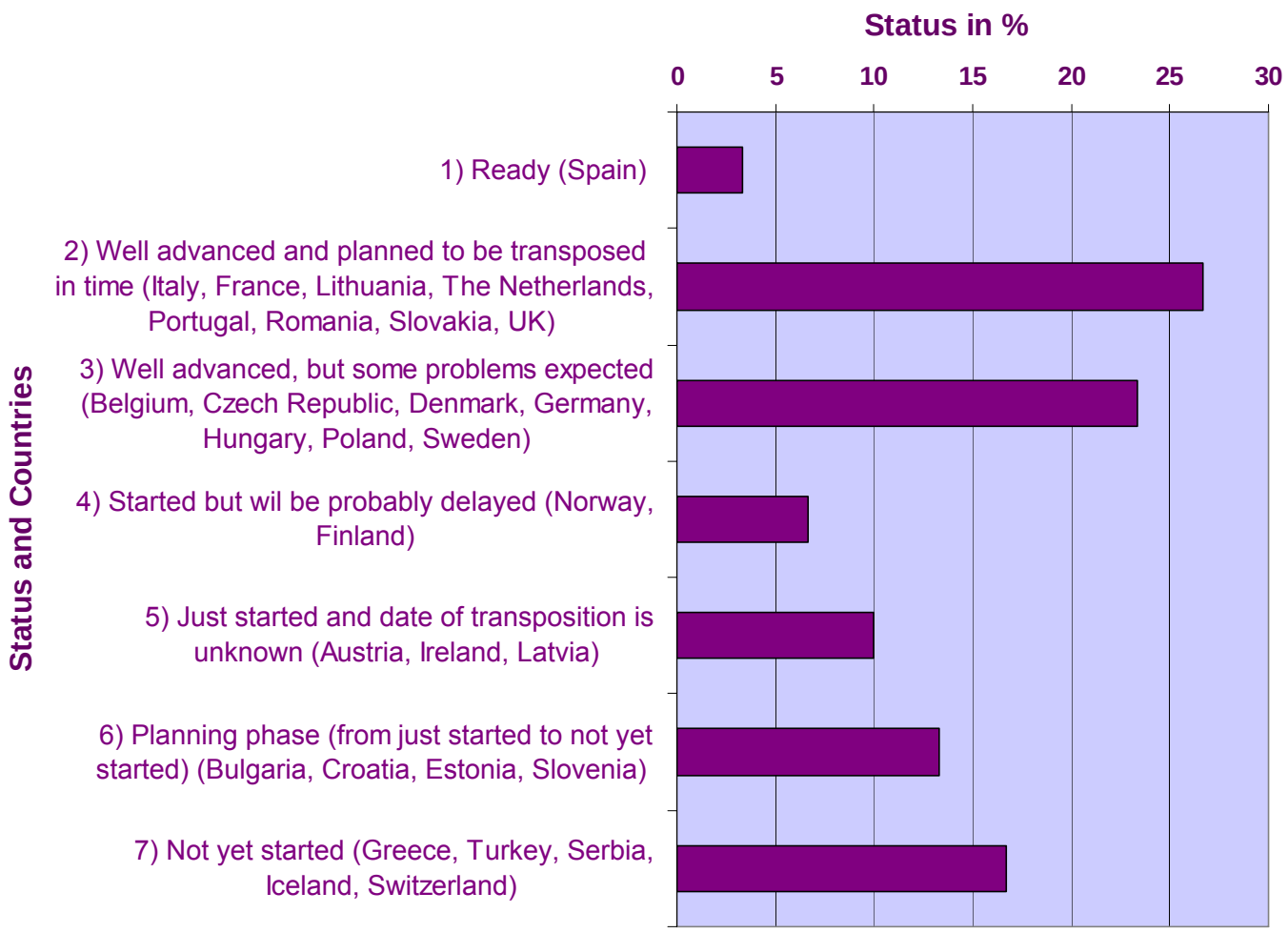

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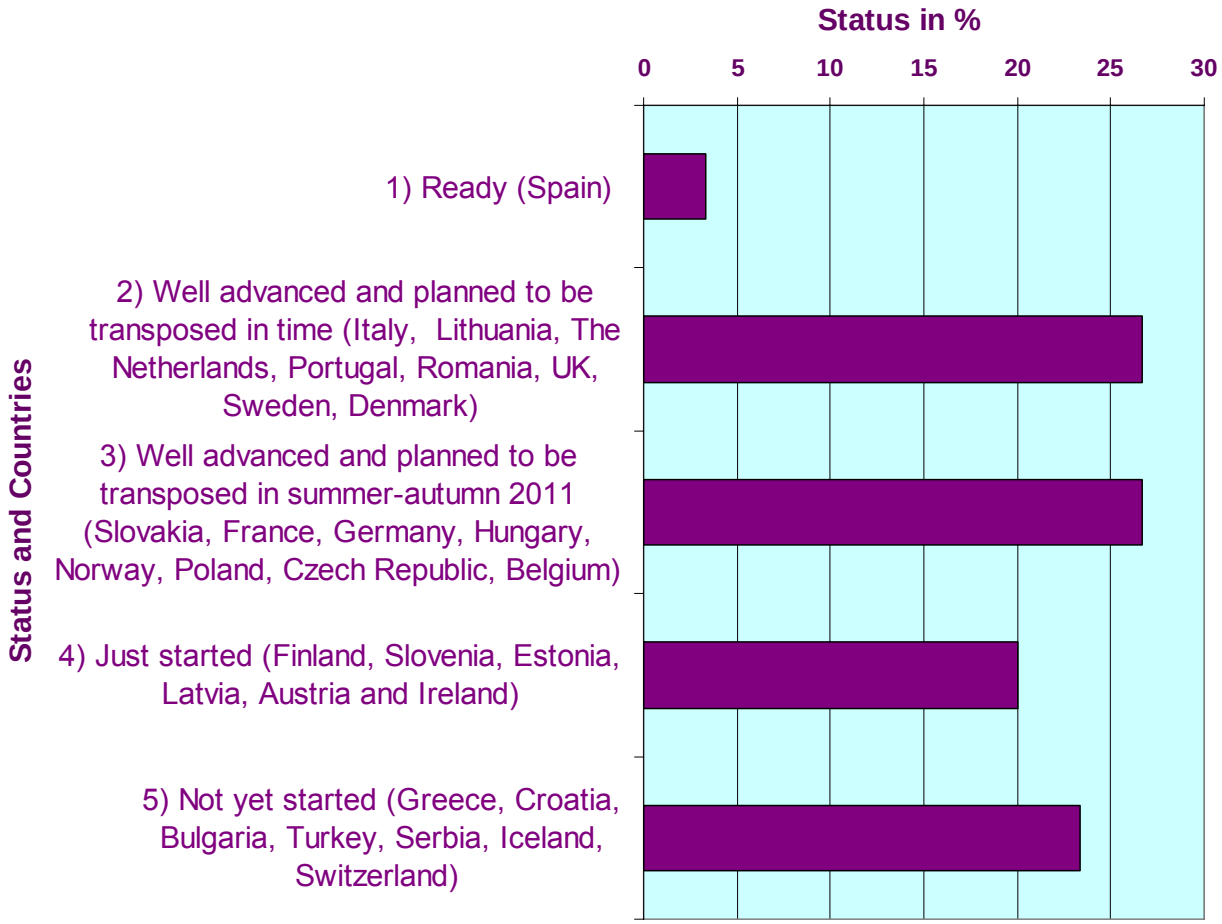

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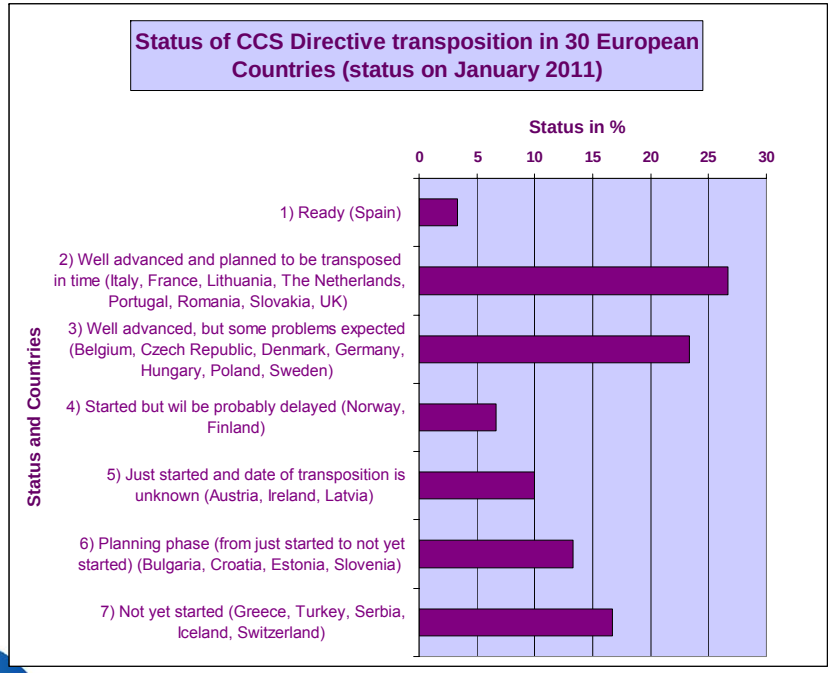
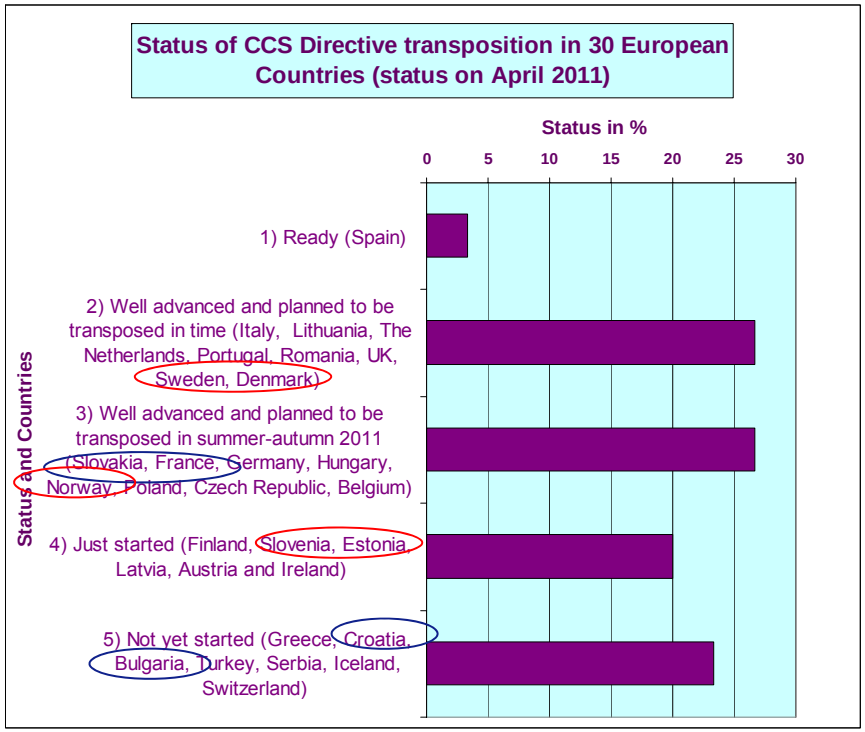




Evaluation of transposition process

- **Successful (10)**
- **Italy**
- **Spain** (The law has been already published by the Official State Bulletin on December 29th 2010)
- **Denmark**
- **UK**
- **Lithuania**
- **Portugal**
- **Romania**
- **Slovakia**
- **The Netherlands**
- **Belgium** 1/4 (successful only in the Flemish Region)

- **Fair (5 in January / 6 in April)**
- **France** (relevant laws approved, the decrees specifying how the laws should be enforced are well advanced)
- Sweden (Law proposal is in the late stage of preparation)
- **Hungary**
- **Norway (**The directive is planned to be implemented as regulations pursuant to The Norwegian Pollution Control Act and The Continental Shelf Act)
- **Finland (**A successful national co-operation can be expected between authoritative ministries, and (regional) HSE permitting authorities. A wide set of various interest groups will be consulted during the transposition process).
- Ireland (The lead Government Department and the Competent Authority for some articles have not been confirmed and process is therefore insufficiently advanced)

Evaluation of transposition process

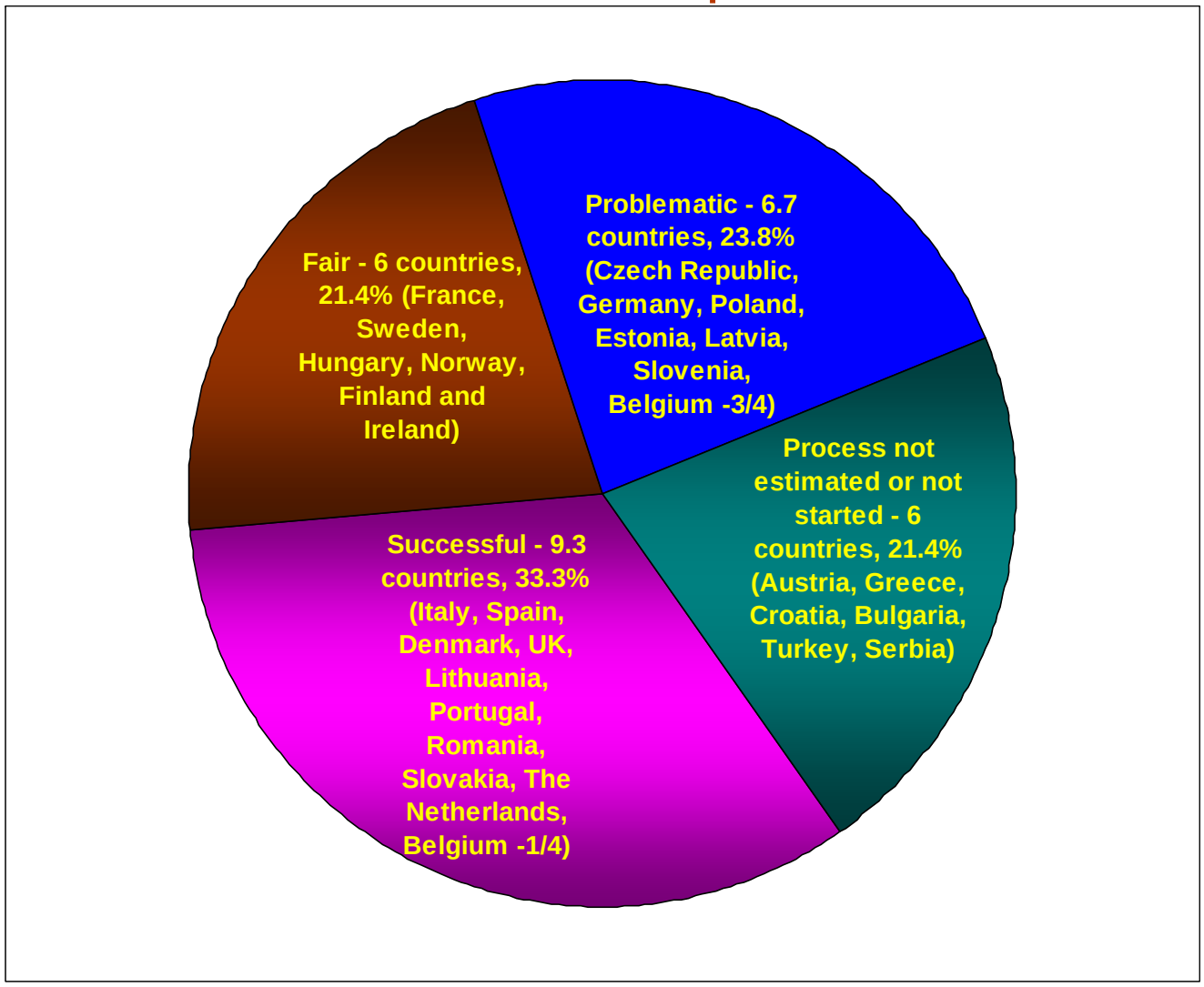
➢ **Problematic (7)**

- **Czech Republic** (disagreement between Ministry of Industry (proposes general ban of CO2 storage) and Minisitry of Environment (supports full transposition of the Directive) has not been solved yet. Disagreement regarding the form of implementation (separate law or amendment of existing ones) has been solved in favour of separate law).
- **Germany** (different Federal states had opposing positions and some insist on an op-out close of their territories)
- **Belgium (2/3** (rather problematic in 2 Regions of Belgium without storage options. Federal Goverbnment are going to forbid storage in the North Sea)
- **Poland** (might be either fare or problematic because of not so smooth cooperation of ministries and environment agendas (on the full chain).
- **Estonia** (quite a problematic, due to the dragging discussions with the EU Commission. And due to the lack of CO2 storage sites in Estonia, the interests to CCS is close to zero).

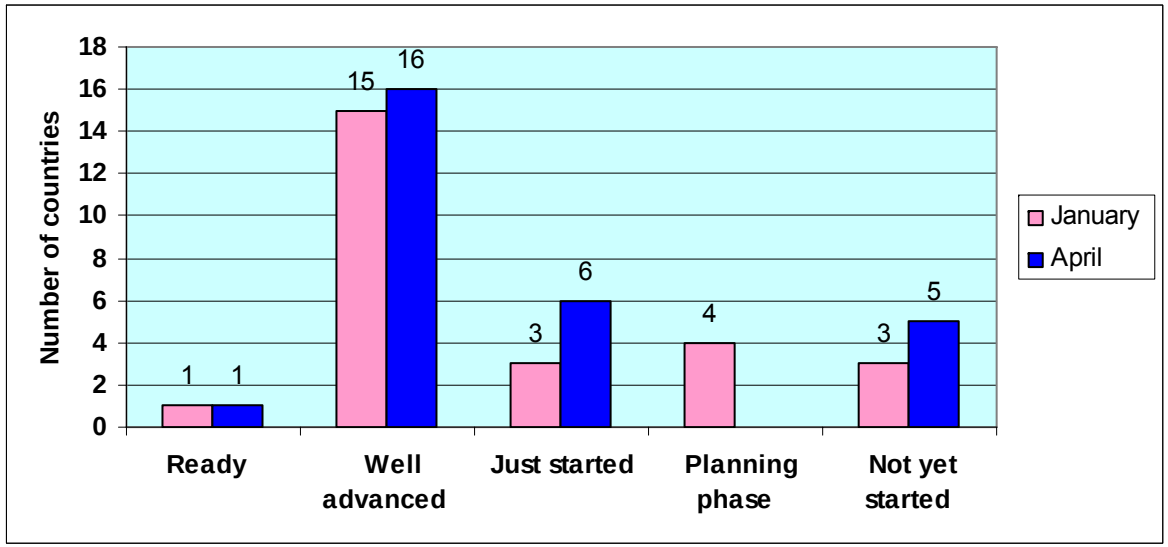
➔ **Latvia** (no political decision of the State Energy Policy, possible problems with landlords, owing land and underground at the possible storage sites)

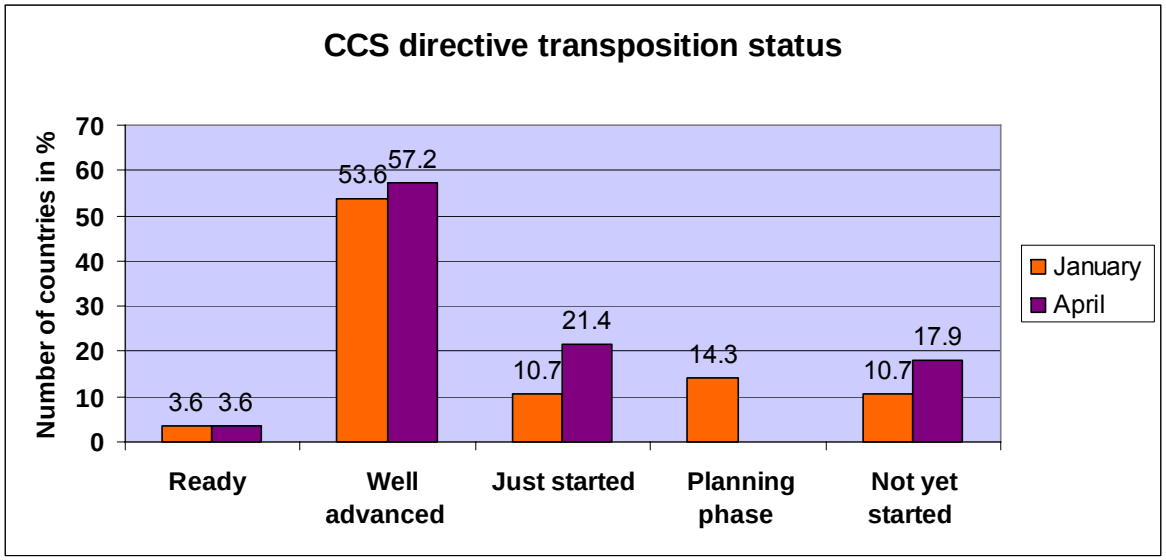
➔ **Slovenia** (slow process, national priorities are not yet defined)

Evaluation of transposition process in 28 CGS Europe countries



Progress in CCS legislation process during 3 months (end January-end April) in 28 CGS Europe countries





Guidelines writing and decrees

- **Only 6 European countries reported the ongoing or planned process of guidelines writing**
- France (Guidlines draft is prepared now by BRGM, IFP and other public institutions and will be finished by September 2011)
- Germany (Recommendations and guidelines have been proposed for discussion by BGR. Discussion paper: STABILITY Report on site selection and safety criteria, abandoned wells and monitoring guidelines)
- Hungary (specific Government Decree has been also prepared)
- Norway (Climate and Pollution Agency and the Norwegian Petroleum Directorate are working on guidelines)
- Poland (Law proposal included guidelines for the application of the relevant law. Polish Platform of Clean Coal Technologies provided own guidelines as well).
- Spain (rules for the published law application are still in the writing process)
- Denmark (Guide is expected as anologue to Guide to hydrocarbon licences)
- **and 2 countries reported decrees in addition to laws**
- Czech Republic
- Hungary

- **Some countries reported about prepared or planned national reports before legislation**
- Austria (national report before legislation)
- Estonia (Report on legislation and regional storage capacity was prepared by TTUGI for national company Eesti Energia in 2009. Results were presented by requiest to Ministry of Environment of Estonia in January 2011).
- Finland (report to authorities is planned)

National Problems Reported

- CCS is not a part of the official national policy:
- Denmark, Slovenia, Sweden, Latvia and Estonia
- Ongoing public and political debates
- Germany, Poland, Czech Republic
- Probable insufficient storage capacity (Czech Republic),
  or absent storage capacity (Estonia, Finland, Belgium (2/4))
- Financial matters
- Czech Republic, Latvia, Estonia
- Cross border storage and transport and mineral carbonation are not described in CCS Directive, not in guidances
- Estonia, Finland
- Russian Territory in the Baltic Sea next to the Swedish territory in connection to potential storage complex
- Sweden
- Change of ministerial structure after elections
- Hungary
- Absent public acceptance (perception)
- Denmark, Germany, Poland, Sweden
- Complexity in competent authorities because of the complexity of the country, or different situation in the different regions.
- Spain, Belgium

Switzerland (IEA published data 2010)

- The Federal Office for the Environment (FOEN) and the Swiss Federal Office for Energy (SFOE) have a shared competence in dealing with CCS
- Due to the domestic energy supply being mainly based on hydro and nuclear power, the potential for CCS in Switzerland currently is low.
- Approximately 5 percent of power is generated in fossil power plants, whereas 75 percent of all CO2 is being emitted by non-point sources such as transport, commercial and residential heating.
- This results in relatively low CO2 per capita emissions (5.8 t CO2 in 2008).
- Except for a few cement production and waste incineration sites, there are no large point sources in Switzerland.
- Furthermore the geological storage potential of CO2 is yet unknown.
- In August 2009, the Federal Council announced in its proposal for the amendment of the Swiss legislation on the reduction of CO2 that guidelines concerning CCS will be provided when necessary.
- National funded Swiss research project Carbon Management in Power Generation (CARMA, 2009-2011) is ongoing with participation of six Swiss research institutions
- CARMA aims to explore the potential and feasibility of CCS systems deployment in Switzerland, taking into account the future energy scenarios.
- It also aims to exploit available expertise and to develop new CCS technologies and know-how that might be applied in Switzerland.
- The Project consists of six subprojects, one of which focuses on the public perception and the legal aspects of CCS.
- There are no ongoing legal or regulatory developments concerning CCS so far.

Iceland (VTT report and other publications, 2010)

- In 2007 in Iceland were only three industrial facilities with CO2 emissions exceedin 0.1 Mt: two alluminium plants and one ferroaly plant, in total emitting 1.08 Mt CO2 (The total CO2 emissions were 3,29 Mt (UNFCCC, 2010)
- Iceland has no deep porous sedimentary rocks, but has several deep and shalow basaltic lava flows, which are much more reactive than other silicates and may store CO2.
- This option is studied by CarbFix pilot project. The target formation at a depth of 400-800 m consists of basaltic lava flows and hyaloclasite. The total CO2 storage potential of basalts is not yet estimated.
- At Hellisheidi pilot storage site storage capacity is estimeted as 12 Mln t CO2, that is enough for 200 years for the nearest geothermal Power Plant, emitting annualy 60000 t CO2 (Gislason et al, 2010).
- Any information about CCS legislation is absent, and most probably has not yet started.

The most problematic issues which have common interest to discuss

- Conflicts of interests/interaction with other underground use interest – groundwater protection, hard coal deposits, natural gas storages, geothermal (Italy, Czech Republic, Denmark)
- Financial security (Czech Republic, Hungary)
- Corrective measures (Norway)
- Well abandoment procedure (The Netherlands)
- Criteria for qualification and responsibility transfer to the authorities in the post closure phase, verification and transfer of liability from the operator to public (The Netherlands, France, Croatia, Bulgaria)
- Licensing phase (Croatia, Bulgaria)
- Aspects connected with the practical application (Italy, Latvia)
- Technical concepts that must be included in legislation (Turkey)

The most problematic issues which have common interest to discuss

- Regulations and guidelines for implementation of CO2 storage
  (Germany)
- Public and political debates
  (Germany, Denmark)
- Competent Authority: how to guarantee a sufficient level of expertise and objectiveness, are they ready to evaluate applications
  (Belgium, Spain)
- Cross-border transport and storage
  (Belgium, Estonia, Finland, Spain, Lithuania)
- Site characterization and assesment of storage capacity: organization and standartization, information to public
  (France, Italy, Slovenia, The Netherlands)
- Monitoring issues, possibility of leakage
  (Italy, Norway, France, Hungary, Croatia, Greece, Slovenia, Bulgaria)
- Translation issues (Spain, Lithuania)

The most problematic issues, not covered in CCS Directive, which have common interest to discuss

- Public awareness on CCS technology and geological structures (France, Italy)
- Public acceptance (Poland)
- Cross-border issues (Estonia, Finland, Belgium),
- Storage complexes extending to the countries not covered by directive (Sweden),
- Legislation of the full chain of CCS (Poland)
- Transformation of natural CO2 deposits into underground reservoir of methane (Slovakia)
- EOR (Denmark)
- Link with other EU Direcive (Water, Wastes, Hydrocarbon wells safety, etc.) (France, Hungary)

To store, or not to store: that is the question:

- Estonia and Latvia are planning to take laws prohibbiting CO2 storage at their teritories

Why:

- Estonia: explained by absent geological conditions for CO2 storage (shallow sedimentary basin, no structures, potable water everywhere in aquifers).

- Latvia: "It is discussed now - partly or fully not-allowing the geological storage, giving priority to geothermal and natural gas storage use of geological structures. Regulation of Cabinet of Ministers on CO2 transport networks, access, transboundary cooperation - public consultations are ongoing"

- Denmark: 31.03.2011 Climate and Energy Minister of Denmark decided to postpone onshore CO2 storage until 2020, but to start with EOR (Enhanced Oil recovery) offshore, in the North Sea.
- Why: absence of public perception

- Sweden
- Law will permit only offshore storage.
- Why: mainly offshore capacity is available

To store, or not to store: that is the question:

- Belgium : The Walloon Region is considering not to allow storage on its territory; The Brussels Capital Region and the federal government (for offshore storage) will try to prove that they have no geological storage capacity (only limited transposition needed)

- *Finland: Finnish energy company Fortum Oyj stopped the Finncap carbon capture and storage (CCS) project in autumn 2010, due to the technological and financial risks.* EU programme covers only a portion of the costs of the approximately EUR 500-million project. In addition to EU funding the project was not able to get national funding from Finland

- Germany: The government has agreed upon a draft CCS law, (which has to pass parliament), while Federal states had opposing positions and some insisted on forbidding storage at their territories.

IEA releases first Clean Energy Progress Report (Apr.06. 2011)

- In order to achieve a 50% reduction in energy-related CO2 emissions by 2050, IEA research shows that around 100 large-scale CCS projects will be needed by 2020, and over 3,000 by 2050. “This represents a significant scale-up from the five large-scale CCS projects that are in operation today.”

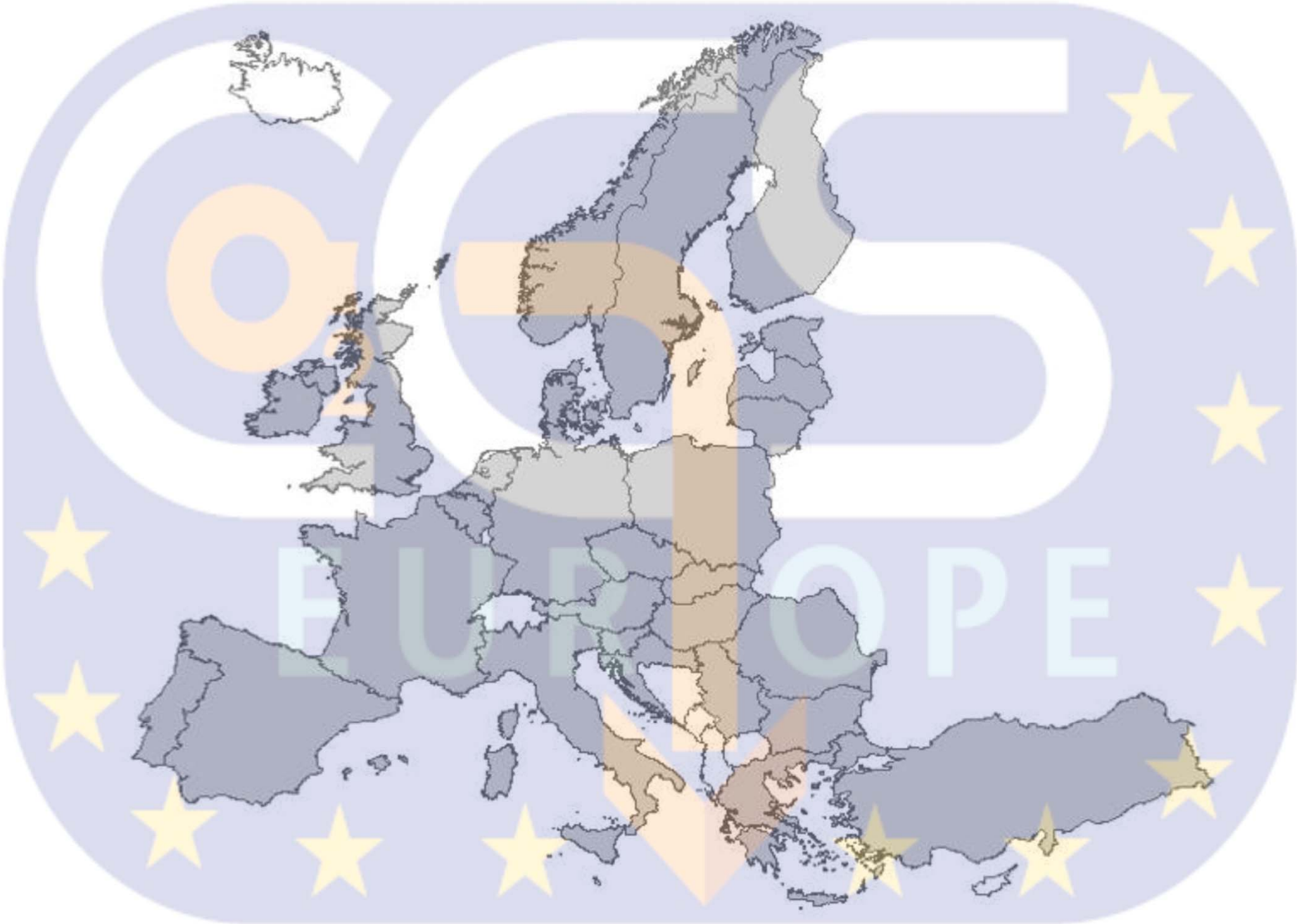
- While there are over 70 CCS projects currently planned, the report says it is uncertain how many will be realised because of recent delays in allocating public funding.

CONCLUSIONS

- Among 30 European countries about 56.7% are well advanced in CCS regulation which are ready or will be transposed during this year, 20% have already started tranposition process and only 23.3% have not yet started.
- Among 28 CGS Europe project countries 55% estimated the transposition process as successful and fair, 24% as problematic and 21.4% of countries could not estimated the process (1 country), or it has not been started (5 countries).
- All countries with ongoing and planned CCS demo and industial projects reported the transposition process as successful and fare.
- At least 6 countries reported that CCS storage could be prohibitted at their territories (either onshore or offshore) nationally or by regional governments by different reasons (including absent storage capacity and conflict with other use).
- There are a lot of work need to be done in all the countries by regulators, stakeholders and researchers.
- In most of the countries the guidelines to laws in CCS are still to be written or prepared, as only 6 countries have reported already proposed guidelines.

- We wish to all the CGS Europe partners successful implementation of CCS technology in your countries and fruitful international cooperation!

- Thank you for attention!


EUROPE