



# CARBON CAPTURE AND STORAGE REGULATORY TEST TOOLKIT FOR ROMANIA





## Table of contents

1	Overview.....	3
2	Abbreviations .....	4
3	Executive Summary .....	5
4	Romanian CCS Regulatory Toolkit .....	6
4.1	Planning and Preparatory Phase .....	6
4.2	Key Agencies and Permits .....	8
4.3	CCS Workshop .....	10
4.3.1	Capture .....	13
4.3.2	Transport .....	14
4.3.3	Storage .....	15
5	Key Learnings.....	17
6	Actions.....	18
	Annex no. 1: Matrix.....	19
	Annex no. 2: Rules of Engagement .....	20
	Annex no. 3: Feedback Forms .....	22
	Annex no. 4: Summary of Delegate Comments .....	23



## 1 Overview

In the context of Romania's Getica CCS Application for NER300 funding, the Carbon Capture and Storage (CCS) Regulatory Toolkit was deployed to help the Romanian Government test and improve the legislative framework governing the implementation of CCS projects in Romania. The purpose of the Toolkit is mainly to identify capacity issues and gaps and/or overlaps in the permitting process in order to streamline it.

Romania transposed EU Directive 2009/31/EC on the geological storage of carbon dioxide through Government Emergency Ordinance (GEO) no. 64/2011. GEO no. 64/2011 sets out the regulatory framework for CCS in Romania which was subject to the regulatory review under the CCS Regulatory Toolkit.

The Toolkit was developed by the Global CCS Institute (**Institute**) based on a test exercise to assess the existing regulatory and consenting framework for CCS in Scotland. The Institute was involved throughout the Scottish project and, in conjunction with Edinburgh University, developed a generic Toolkit which may be applied by other governments.

The Toolkit is designed to allow a detailed evaluation of the adequacy of pre-existing regulatory practices to regulate the entirety of the CCS chain, which in turn will enable government and regulators to swiftly address gaps and obstacles to the deployment of the technology.

In terms of the Romanian application, the CCS Regulatory Test Toolkit has two main components: (i) the regulatory matrix identifying the permits, approvals and authorizations required for implementing CCS projects from planning and construction to decommissioning (**Matrix**), and (ii) the Workshop whereby the Matrix is formally submitted to the attention of the public authorities which are invited to comment upon the Matrix.

As part of the Romanian CCS Regulatory Toolkit, based on the legislation in force as of the date of drafting the Matrix, Salans prepared the Matrix which was formally submitted to the attention of the Romanian public authorities during the Workshop organized on 21 and 22 July 2011 in Poiana Brasov, Romania (**CCS Workshop**). The authorities were invited to comment on the Matrix.

This report summarizes: (i) the principles upon which the Matrix was drafted, (ii) the action plan for organizing the Workshop, and (iii) the outcome of the Workshop.



## 2 Abbreviations

<b>ANRE</b>	Romanian Energy Regulatory Authority
<b>CCS</b>	Carbon capture and storage
<b>EIA</b>	Environmental impact assessment
<b>EPA</b>	Environmental Protection Agency
<b>GEO</b>	Government Emergency Ordinance
<b>GHG</b>	Greenhouse gas
<b>MEF</b>	Ministry of Environment and Forests
<b>NAEP</b>	National Authority for Environmental Protection
<b>NAMR</b>	National Agency for Mineral Resources
<b>NRAE</b>	National Regulatory Authority for Energy
<b>RAEP</b>	Regional Authority for Environmental Protection



### 3 Executive Summary

The Romanian CCS Regulatory Framework Toolkit was completed in six months. It ran from April to September 2011.

The scope of the CCS Workshop was to assess the Romanian CCS regulatory framework with the involvement of all key stakeholders. The CCS Workshop was a two-day event that was attended by managerial level representatives of the Romanian public authorities and observers.

The Workshop revealed that increased institutional capacity of the Romanian authorities, the involvement of local authorities and regulatory agencies and timely public engagement, are essential to the success of the CCS permitting process.

The Romanian environmental authorities, the National Agency for Mineral Resources (**NAMR**) and the local authorities were identified as central to the implementation of CCS projects in Romania whereas environmental impact assessments, building permits for the transport pipeline and storage permits were seen as “show stopper” permits.

#### Key Learnings

The Workshop debates led to five key learnings:

1. institutional capacity has to be increased to improve the permitting process;
2. the engagement of the local communities in the area of the project is crucial;
3. environmental authorities need to make a decision on the divided or integrated approach of the three CCS components;
4. government departments and agencies have to cooperate and the meetings of the Steering Committee should continue being organized on a regular basis; and
5. key local authorities and agencies should to be involved as of early stages in the permitting process.

#### Next Steps

The following next steps were decided upon:

- continued activities of the inter-ministerial working group on CCS;
- the development of action plans assigning responsibilities at ministerial level;
- creation of small inter-ministerial working group on regulatory issues; and
- improvement of existing CCS specific legislation.



## 4 Romanian CCS Regulatory Toolkit

### 4.1 Planning and preparatory phase

The Romanian CCS Regulatory Framework Toolkit ran from April to September 2011. This section describes the preparatory work that went into the rollout of the Toolkit in Romania.

#### Steering Committee

The first meeting of the Steering Committee was held in April 2011. The Steering Committee included managerial level representatives of the key authorities. The Steering Committee held a total of four meetings prior to the CCS Workshop, which included presentations by the European Commission, International Energy Agency and Scottish Government. The Institute played an active role in the meetings of the Steering Committee offering its guidance and sharing knowledge on CCS from other jurisdictions.

#### Legal Consultant

During April 2011, a legal consultant was contracted on behalf of the Romanian Government. The legal consultant was selected on the basis of expertise in environmental, mining and regulatory issues.

The main role of the legal consultant was to undertake thorough research of existing legislation, draft the Matrix and to report on the CCS Workshop. In addition, the legal consultant was also involved in the meetings of the Steering Committee and in the organization of the CCS Workshop. The legal consultant drafted the rules of engagement and sent out the invites to the CCS Workshop.

#### Matrix

The first draft of the Matrix was prepared by the legal consultant in approximately three weeks. Throughout May and June the draft Matrix was examined by the Steering Committee. Following the meetings of the Steering Committee, the draft Matrix was constantly updated. In addition, the list of relevant authorities has been updated and improved as the debate on regulatory matters progressed.

Whereas the Steering Committee in Romania involved approximately twenty representatives of the public authorities, it was decided to organize three intermediate smaller group meetings between the public authorities identified as being essential to the success of the permitting process: Ministry of Environment and Forests (**MEF**), National Authority for Environmental Protection (**NAEP**), National Agency for Mineral Resources (**NAMR**), and Regional Authority for Environmental Protection (**RAEP**). The purpose of these meetings was to facilitate dialogue on specific detailed matters that required the consent and the coordination between these key authorities (*e.g.*, CO<sub>2</sub> leakages monitoring plans).

The conclusions of the Matrix on planning consents were also discussed with the local public authorities, *i.e.*, county councils of the counties traversed by the transport pipeline. Separate meetings were organized in this respect because of the complexity of urban issues.



The Matrix followed the three components of the CCS chain: capture, transport and storage. Each of the components was then divided into four development phases: planning and construction, operation, decommissioning, post-decommissioning. For each phase, the Matrix listed the relevant building/environmental/health and safety and NRAE/NAMR permits/licenses. Please see Figure no. 1 for a cross-section of the Matrix.

The Matrix (attached as Annex no. 1) lists the relevant and applicable legal provisions, as in force at the time of drafting. It identifies authorities in charge, the timeframes for obtaining permits and comprises a section presenting implications of country specifics on the permitting process, where applicable.

The Matrix was drafted to:

- (a) generate a comprehensive list of permits, approvals, authorizations required for the planning and construction, operation, decommissioning and post – decommissioning of CCS projects in Romania;
- (b) identify all relevant authorities and the relationship between these authorities;
- (c) determine which procedures for obtaining permits/approvals/authorizations could be run in parallel or not in order to improve permitting timeframe;
- (d) identify the “show stopper” permits/approvals/authorizations;
- (e) identify overlaps in permits or in attributions of relevant authorities in order to increase the efficiency of the management of the relationship operators – public authorities;
- (f) list potential *de facto* challenges due to country/area specifics; and
- (g) propose legislative amendments required to streamline the permitting process.

### **CCS Workshop**

The resulting Matrix was presented to the public authorities during the CCS Workshop, using Romania’s Getica CCS Application for funding under the European Commission’s NER300 competition. The CCS Workshop was a two-day event and required four weeks of preparatory work.

Contributing factors to the success of the CCS Workshop included:

- the venue of the CCS Workshop was outside of Bucharest to make sure that all attendees were dedicated to the two-day CCS Workshop;
- the CCS Workshop was held in Romanian with English translation for international participants;
- the draft Matrix was circulated to the confirmed participants at the CCS Workshop one week in advance of the event in order to allow participants to familiarize themselves with the draft Matrix;





- all confirmed participants were informed one week in advance of the event of their expected input; please refer to Annex no. 2 for samples of rules of engagement depending on the capacity of the participant, *i.e.*, public authority, observer; and
- the rules of engagement sent a clear message as to what each participant was supposed to do and when; the rules of engagement also described the structure of the Workshop: which authority/operator was responsible for the opening presentation(s) on each component of the CCS chain, other presentations, subsequent debates, summary of key issues identified as requiring further (regulatory) action, and guidance on how to fill in the feedback forms.

## Report

Following the CCS Workshop, this report was drafted with a view to describing the entire process of organizing the Romanian CCS Regulatory Test Toolkit and to identify both the lessons learnt and those requiring further action. This report was drafted in the eight weeks following the CCS Workshop.

This report draws upon the information provided by the attendees through the feedback forms. The feedback forms (see Annex no. 3) are essential to the success of the CCS workshop. Participants were told at the start of the Workshop that they were expected to fill in the feedback forms for each of the CCS Workshop sessions. Participants were also reminded at the beginning and end of each working session that they are expected to fill in and return the feedback forms.

### 4.2 Key Agencies and Permits

The Romanian environmental authorities, NAMR and the local authorities were identified as central to the implementation of CCS projects in Romania. Environmental approvals, building permit for transport pipelines and storage license were considered the “show stopper” permits.

The Romanian environmental authorities are involved throughout the entire CCS chain: capture, transport and storage through the environmental impact assessments and approvals required for deforestation of areas allocated to transport pipelines.

NAMR plays a key role for the storage of CO<sub>2</sub>.

The local authorities are instrumental to the issue of building permits for transport pipelines. One of Romania’s country specifics is that of poor urbanism documentation which may impact the timing for obtaining the building permit. Most Romanian local authorities are currently still in the process of elaborating general urbanism plans and/or zonal regional plans which represent the basis of other urbanism documents such as the building permits.



Place in CCS Chain	Permit	Area Covered	Legal provisions	Competent Authority	Timing	Work needed to complete submission	Legislative amendments	Comments
<b>CAPTURE / Design &amp; Construction</b>	Environmental agreement	Design&Construction/Environment&Water; Construction&Planning	Order no. 135/2010; GD no. 445/2009; EO no. 195/2005;	Regional authority for environmental protection	Issued upon completion of the EIA	Presentation memorandum, notification for hazardous substances, safety report.	GD no. 445/2009 should be amended to cover CO2 capture, transport and storage.	In practice, timing may exceed 4 (four) - 5 (five) months.
<b>CAPTURE / Operation</b>	IPPC permit	Operation/Environment & Water	EO no. 152/2005; Order no. 818/2003; Order no. 36/2004	Regional authority for environmental protection	6 (six) months	Location report, safety report.		
<b>CAPTURE / Decommissioning</b>	Decommissioning Permit	Decommissioning/Construction&Planning	Law no. 50/1991; Order 839/2009;	Local (Turceni) City Hall	30 days	Complete technical documentation must be submitted.		Same conditions as for building permit.
<b>TRANSPORT / Design &amp; Construction</b>	Building Permit	Design&Construction/Construction&Planning	Law no. 50/1991; Order 839/2009; Law no. 350/2001; Law 10/1995.	County Councils	30 days	All documents requested by urbanism certificate.		One building permit per section of the pipeline per county.
<b>TRANSPORT / Operation</b>	Transport license	Operation/Energy & Infrastructure	EGO no. 64/2011	ANRE	[Maximum 60 days.]			ANRE should develop corresponding legislation.
<b>TRANSPORT / Decommissioning</b>	Environmental agreement	Decommissioning/Environment&Water	Order no. 135/2010; GD no. 445/2009; EO no. 195/2005;	Regional authority for environmental protection	Issued upon completion EIA	Presentation memorandum, notification for hazardous substances, safety report.		In practice, timing may exceed 4 (four) - 5 (five) months.
<b>STORAGE / Design &amp; Construction / Appraisal</b>	Exploration permit	Design&Construction/Appraisal/Construction&Planning	EGO no. 64/2011	ANRM	Appraisal [90 days from submitting the final exploration report.]		[ANRM should develop corresponding legislation.]	The exploration permit should include any requirements for workover approvals.
<b>STORAGE / Design &amp; Construction / Injection</b>	Storage Permit	Design&Construction/Injection/Construction&Planning; Energy & Infrastructure	EGO no. 64/2011	ANRM	Injection [xxx]			
<b>STORAGE/ Operation/Injection</b>	Environmental permit	Operation/Environment&Water	Order no. 1798/2007	Regional authority for environmental protection	Maximum 90 days as of submission of complete file	Layout, location plan, minutes ascertaining compliance with obligations in the environmental agreement.		It may include a conformity programme.
<b>STORAGE/Decommissioning</b>	Decommissioning clearance	Decommissioning/Energy & Infrastructure	[xxx]	ANRM				The environmental approval for decommissioning is required.
	Opinion of the EC on operator's report for approval of the transfer	Post-decommissioning/[xxx]		European Commission				
	Transfer of liability to ANRM	Post-decommissioning/[xxx]	[xxx]	ANRM		Approval of transfer report.	[ANRM should develop corresponding legislation.]	The issue of the financial security should be addressed.

Figure no. 1: Cross-section of Romanian Matrix

### 4.3 CCS Workshop

#### Scope of the CCS Workshop

The scope of the Workshop was to assess the Romanian CCS regulatory framework by actively involving all the key stakeholders. Romania's Getica CCS Application under NER300 was used as case study. The assessment was intended to answer four main questions in relation to the permitting of CCS projects in Romania:

- what are the regulatory and institutional overlaps/gaps;
- how can the regulatory process be streamlined/improved;
- where should the institutional capacity be strengthened; and
- where there is a need for additional information.



#### Outcomes from CCS Workshop

The Workshop revealed that:

- increased institutional capacity of the Romanian authorities and public engagement, particularly in the early stages, is essential to the success of the CCS permitting process;
- given the complexity of the project, the CCS Workshop was considered to represent an excellent starting point for the various competent authorities to work together as the project progresses; and
- integrating into existing networks for exchange of best practice would be beneficial for the Romanian authorities. One example is the CCS Interest Group within the EPA Network (<http://epanet.ew.eea.europa.eu/>). Other bilateral contacts with ministries in other countries going through similar processes should be sought.

#### Overview of the CCS Workshop



The CCS Workshop was a two-day event. Around 80 participants attended and they included representatives of public authorities of managerial level, delegates from the European Commission, International Energy Agency, the Institute, University College London, Schlumberger, ISPE and Alstom (members of the technical consortium for Romania's Getica CCS Application) also gave presentations on capture technology and site characterization.



Upon arrival, participants were handed booklets containing information on the CCS technology and the CCS process.

The event was held in Romanian. Translation into English was at all times available for non Romanian speakers.

The main facilitator of the CCS Workshop was Mr. Nicolae Anastasiu, PhD, who is a high profile academic in geology. His role was to moderate the debate between the public authorities.

### **The Role of the Facilitator**

The facilitator should guide the discussions through structured questions in order to draw contributions from the participants and ensure a conclusion is reached.

#### Box no. 1: The Role of the Facilitator

The main facilitator received the support of an associated facilitator: Mrs. Cristiana Ion, representative of the Ministry of Economy, whose role was to offer support to the main facilitator whenever the debate got into specific technical or regulatory details.

At the event's opening, the participants were reassured that the entire CCS Workshop represents a learning process because of the novelty surrounding the concept of CCS and therefore a major component of the Workshop was that of sharing information on CCS. In addition, the moderator informed the participants of the following with respect to the structure and scope of the Workshop:

- all comments made by the attendees during the sessions were not attributable and confidential;
- the scope of the Workshop is to assess the CCS regulatory framework in Romania, and not Getica's CCS application - Romania's Getica CCS application will serve exclusively as a case study;
- attendees are expected to be actively involved in discussions and contribute to frank and open discussions about the CCS regulatory framework in Romania;
- the Workshop is divided mainly into three working sessions: capture, transport and storage and one session for debating the findings of the Workshop;
- each session will begin with presentations of the technical aspects of Getica CCS given by members of the technical consortium;
- following the technical presentation, the companies involved in putting together the Gettica CCS application will present their views on the permitting process;
- upon completion of presentations, authorities will be invited to express their points of view;
- each of the three sessions will end with the summary of key findings; and



- during each session, five minutes will be specifically allocated for attendees to fill in the feedback forms – fill in and return of forms is mandatory.

Following these opening remarks, the CCS Workshop was open for discussions on the permitting of each of the three components of the CCS chain.

### **CCS Workshop: Structure**

The Workshop was structured around the idea that CCS represents a cutting edge concept and therefore, to begin with, the participants need to be offered as much information as possible on the technology.

The Workshop was divided into four sessions:

- three working sessions corresponding to the three components of the CCS chain: capture, transport and storage; and
- one final session for summarizing the key findings of the Workshop. During this final session, the observers were invited to present their observations/comments.

At the end of each of the three working sessions, the key findings of the session were summarized.

Box no. 2: CCS Workshop: Structure

### **CCS Workshop: Methodology**

Each of the working sessions began with the presentation of the technology for the respective CCS component. Participants found useful for a better representation of the technology cross-references such as: the carbon capture technology represents in fact a large chemicals plant, or the storage technology uses principles already in place in the mining sector.

In order to facilitate a better understanding of the permitting process of CCS projects, Romania's Getica CCS Project (submitted for NER300) was used as case study. This was the first time the Toolkit process has been applied to a real CCS project. Therefore, following presentation on technology, each of the three companies involved in Getica CCS Project gave presentation on the permitting of their component: CEN Turceni on carbon capture, Transgaz on carbon transport, and Romgaz on carbon storage.

The permitting presentations followed the structure of the Matrix – each presentation listed the permits identified for each of the four implementation phases: planning and construction, operation, decommissioning, post-decommissioning. Also, each phase was divided into: building authorizations, environmental agreements/permits, licenses/permits issued by NRAE/NAMR and health and safety.

Box no. 3: CCS Workshop: Methodology



#### 4.3.1 Capture

##### (a) Overview

The working session on capture was opened by the presentations given by CEN Turceni (a major power producer, where the capture facility under Romania's Getica CCS Project will be located) on approvals/agreements/permits, followed by the presentations on technology given by ISPE and Alstom (members of the technical consortium involved in drafting the feasibility study for Getica CCS).

Observers noted that having project proponents present at the beginning of each regulatory component provided useful context. They recommended that these presentations should be as succinct as possible.

The environmental authorities were identified as the competent authority for this CCS component, because of the environmental impact assessment (**EIA**) and IPPC permits required for operation. Almost all of the debate centered on the EIA and whether there should be an integrated approach (one EIA for the whole CCS chain) or a divided approach (one EIA for each component of the CCS chain).

The issues raised in the debate also revealed the lack of understanding of the technology by many of the authorities.

At the end of the session, a list of the key issues was drawn on a flipchart to allow participants to make some final remarks. Participants were also reminded of the feedback forms that needed to be filled in and returned to the organizers.

##### (b) Summary

#### Capture: Summary

- EIA: integrated or divided approach.
- Water management approval: authorities need to understand the flow-cycle of substances.
- Greenhouse gas permit: the conditions/requirements for emissions measurement in case of service interruption have to be determined.
- Level of allowed impurities to be determined.

The following points emerged as requiring further consideration:

- i. EIA: integrated or divided approach

Some argued that one EIA would reduce the bureaucracy and would ensure an integrated perspective over the entire CCS project. Others considered that one EIA would be difficult to conduct in the absence of all necessary information on each component of the CCS chain. This would ultimately translate into longer periods of time necessary for acquiring all necessary information on all three CCS components.

Observers suggested the Romanian authorities to look at the UK's and Australia's requirements for environmental impact assessment to see how they are sequenced and how they take into account the full



project. This may be as simple as carrying out environmental impact assessments for each component but ensuring they are presented to the regulator in the proper context (*i.e.*, what other components in the larger integrated project are linked) and consider the spin-off and cumulative effects.

#### ii. Water management approval

The flow-cycle of the substances used in the capture process should be clearly presented to the relevant water authorities to determine the conditions of the water management approval.

With respect to this issue, international observers noted that although some of this information will likely be provided in the environmental impact assessment, it is important for regulators to have outside sources of information upon which to base their decisions. Providing resources for regulators would be helpful in this regard, e.g. scientific publications and links to regulators in other jurisdictions.

#### iii. Greenhouse gas permit

The environmental authorities will need to draft the conditions/requirements for emissions measurement in case of service interruption. In addition, the authorities should also consider the possibility of reducing the bureaucratic chain: operator – NAEP – RAEP for the issuance of the greenhouse gas permit.

#### iv. Level of impurities

The environmental authorities should determine the impurities acceptable for transported CO<sub>2</sub>. The environmental authorities will be collaborating in this respect with the operator.

### 4.3.2 Transport

#### (a) Overview

The working session on transport was opened by the presentations given by Transgaz (gas national transport company, operating the CO<sub>2</sub> transport under Romania's Getica CCS Project) on approvals/agreements/permits, followed by the presentations on technology given by ISPE (member of the technical consortium involved in drafting the feasibility study for Getica CCS).

The local public authorities, the environmental authorities and the water authorities were identified as the competent authorities for this CCS component, because of the EIA, urban planning and the water basins traversed by the CO<sub>2</sub> pipeline. Discussions evolved around the constraints posed by urban planning and the lack of zonal regional spatial plans which should be commissioned by the local public authorities. As the pipeline would be 40 kilometers long and would traverse more counties, each county would have to issue one building permit for the section of the pipeline traversing the county.

At the end of the debate, the list of the key issues was drawn on a flipchart to allow participants to make some final remarks, if the case.

#### (b) Summary

##### **Transport: Summary**

- Zonal Regional Spatial Plan.
- Amendments to Law no. 255/2010.
- Coordination between local public authorities.



The following points emerged as requiring further consideration:

i. Zonal Regional Spatial Plan

The discussion showed that clarification is needed with the local public authorities whether a zonal regional spatial plan is required or not, considering that at this point there is no such plan drafted by the local public authorities of the counties traversed by the transport pipelines. As per article 65 of Law no. 350/2001 on urbanism, in the absence of an approved zonal regional spatial plan, construction works can be undertaken based on a zonal urban plan and the urban general regulation.

ii. Amendments to Law no. 255/2010

Law no. 255/2010 on expropriation for public utility purposes should be amended to declare CCS projects as projects of public utility which would reduce the bureaucratic burden of the terms and procedures for obtaining required permits/approvals/authorizations. The provisions of this law do not apply to the environmental permitting procedures.

iii. Coordination between local public authorities

The coordination among the local authorities will be essential to the issuance of the building permits for the construction of transport pipelines. Each county traversed by the pipeline will issue the building permit for the section of the pipeline traversing the county.

#### 4.3.3 Storage

(a) Overview

The working session on storage was opened by presentations given by Romgaz (gas exploitation and storage national company, operating the CO<sub>2</sub> storage under Romania's Getica CCS Project) on approvals/agreements/permits, followed by presentations on storage site characterization from Schlumberger and GeoEcoMar (members of the technical consortium involved in drafting the feasibility study for Getica CCS).

NAMR, the environmental authorities and the water authorities were identified as the competent authorities for this CCS component, because of the potential CO<sub>2</sub> impact on water columns, and the coordination needed between NAMR and the environmental authorities. Central to the discussions was the limited institutional capacity of NAMR, especially as NAMR will play the key role in drafting the secondary legislation needed for the implementation of GEO no. 64/2011 transposing CCS Directive.

Observers noted that as a result of capacity issues there was no discussion of some crucial components of the project, such as measurement, monitoring and verification obligations, financial security, and the transfer of liability after closure. The focus seemed to be primarily on the early stages (construction) of the project.

While these components are further in the future, early discussion between regulators and project proponents of the expectations around these issues is important to ensure that they are at least on the same page. At the same time, this would enable the project proponents to make sensible investment decisions.



Financial issues (*e.g.*, amount considered necessary to cover post-closure stewardship costs) could still pose problems down the line if they are not discussed early on.

### Future Implications

The debate should not neglect future implications such as: measurement, monitoring and verification obligations, financial security, and the transfer of liability after closure.

Box no. 4: Future Implications

(b) Summary

### Storage: Summary

- Access to data on existing wells has to be improved
- Institutional capacity has to be increased for the drafting of secondary legislation
- Hydro-geological studies should be carried out in respect of the carbon storage
- NAMR and NAEP have to determine the methodology for their collaboration on GHG monitoring plans

The following points emerged as requiring further consideration:

i. Access to data

The access to data concerning existing mining wells should be improved in order to speed up the process of data collection required for an accurate site characterization. To this end, there should be a better coordination between CCS operator - NAMR - the traditional Romanian mining operators that own such data.

ii. Secondary legislation

NAMR will draft secondary legislation for the issuance of the storage permit and management of relationship with the operator, as per GEO no. 64/2011 transposing CCS Directive. NAMR is confronted with a need of increasing institutional capacity.

iii. Hydro-geological studies

Hydro-geological studies should be carried out in respect of the carbon storage.

iv. Jiu River Management Plan

The operator should consult the plan for the management of Jiu river, as approved by Government Decision no. 80/2010.

v. Collaboration Methodology

NAMR and NAEP have to determine the methodology for their collaboration on greenhouse gas monitoring plans.

## 5 Key Learnings

The Workshop debates led to the following five key learnings:

- **Institutional capacity:** has to be increased to improve the permitting process; authorities need a better understanding of the CCS technology.

Observers underlined the clear need for the competent authorities to become better acquainted with CCS, especially with regard to the potential environmental impacts of CO<sub>2</sub> leaks from pipelines and the airborne chemicals resulting from capture processes. Aside from permits, there are a number of processes that will need to be understood by competent authorities as CCS projects enter operation. One example is the monitoring programme required for monitoring, measuring and verification. Another is the ongoing engagement of stakeholders after the formal consultation processes are completed. Another is the monitoring of CO<sub>2</sub> under the Emissions Trading System.

- **Public engagement:** the engagement of the local communities in the area of the project is crucial.

Although at this stage, there is no reason to believe that the local population and the Romanian public will not be highly supportive of CCS projects, it must be borne in mind that public acceptance is one of the main causes of project delays in Europe. Furthermore, surveys performed at EU level indicate that Romanians have little knowledge/only a few heard of the CCS technology and Romania's intentions in this respect.

- **Environmental Impact Assessment:** authorities need to make a decision on the divided or integrated approach of the three CCS components.

In consideration of the institutional capacity gap, Romanian authorities should draw upon the experience of other countries such as the UK, Netherlands and Australia who are more advanced in their regulations of CCS.

- **Cooperation and joint working across Government** departments and regulators will be essential. The Steering Committee should continue meeting on a regular basis to discuss any potential regulatory issues.
- **Early engagement of local authorities and agencies involved** is key to streamlining the regulatory process and improving design.

## 6 Actions

The following actions were identified:

- **Targeted briefings on the technology to the different agencies by technology providers.**

Organized every three months, such briefings will contribute to increasing the understanding of the CCS technology by the Romanian authorities. Meanwhile, the results of the CCS Workshop should be made available to all authorities that may get involved in the CCS permitting process.

- **Increased engagement with the Project Company (represented by the three shareholders: CEN Turceni, Transgaz SA and Romgaz SA) and the regulators.**

- **Follow-up event on a specific topic, such as public engagement issues around transport.**

Building on the experience of the CCS Workshop, other similar events should be organized with a view to tackling some of the specific issues identified during the CCS Workshop. Such targeted events may lead to the development of detailed action plans for addressing such issues.

- **Public information campaigns in the local areas that will be affected by Romania's Getica CCS Project.**

Information on CCS should be made publicly available to allow the public to ask questions and be informed, in readiness for when the environmental impact assessment procedures are initiated.

It should be noted that the Romanian Government commissioned a social study in the area where Getica CCS Project will be developed, to identify the information requirements of the local population.



## ANNEX NO. 1: MATRIX

**[EXCEL MATRIX TO BE INCLUDED]**



## ANNEX NO. 2: RULES OF ENGAGEMENT

### REGULATORY DRY RUN – CAPTURE, TRANSPORT & STORAGE WORKSHOP 21-22 July 2011, Poiana Brasov, Romania

#### 1.1 OBSERVERS' GUIDE

**Purpose** – to assess the regulatory framework for the capture of CO<sub>2</sub>, its transport by pipeline and its storage in depleted hydrocarbon reservoirs, to work through issues encountered, and to agree a way forward for implementing the process in future real applications. Participants need to remember that the objective of the session is to assess the regulatory process and identify gaps, duplications, uncertainties, risks and ways to streamline or improve each of the regulations (it is NOT to assess the actual Getica CCS project application).

**Regulations to cover** – regulations will be grouped and covered in three main sections: PLANNING, ENVIRONMENTAL, SAFETY.

**Developer** – the format for the discussion of each of the three components of the CCS chain will commence with each of Turceni, Transgaz and Romgaz presenting their application information on those components. The competent authorities will then respond and assess the application information.

**Public participation** – under the EU Public Participation Directive, the public are consulted / involved at all stages of the regulatory process, and need to be involved in this dry run.

**Facilitator(s)** – it is their role to chair the discussions between the regulators and the three operators: Turceni, Transgaz and Romgaz. They will ensure that all participants keep to time and to move the discussion to a conclusion as necessary. At the end of each of the three sessions, the main facilitator will chair a summary discussion in which participants reflect on the process and the lessons learnt.

**Your role as observer** – you have to observe the overall process and note down key findings as you go along, using the observer record sheet and the various boxes. You need to make an overall assessment of the process on what worked well and how, and on what could be improved and how. You will be expected to contribute at the end of the second day of the Workshop to the summary, with findings and your work to be included in the final report. This information will be invaluable in helping shape future improvements to the regulatory framework.

#### Timings:

Day 1 (21 July 2011):

Session 1 – CO<sub>2</sub> Capture

Session 2 – CO<sub>2</sub> Transport

Summary of key findings identified during Day 1 of the Workshop

Day 2 (22 July 2011):

Session 3 – CO<sub>2</sub> Storage

Summary of key findings identified during Day 1 and Day 2 of the Workshop



## 1.2 PARTICIPANTS' GUIDE

**Purpose** – to assess the regulatory framework for the capture of CO<sub>2</sub>, its transport by pipeline and its storage in depleted hydrocarbon reservoirs, to work through issues encountered, and to agree a way forward for implementing the process in future real applications. Participants need to remember that the objective of the session is to assess the regulatory process and identify gaps, duplications, uncertainties, risks and ways to streamline or improve each of the regulations (it is NOT to assess the actual Getica CCS project application).

**Regulations to cover** – regulations will be grouped and covered in three main sections: PLANNING ENVIRONMENTAL, SAFETY

**Developer** – the format for the discussion of each of the three components of the CCS chain will commence with each of Turceni, Transgaz and Romgaz presenting their application information on those components. The competent authorities will then respond and assess the application information.

**Public participation** – under the EU Public Participation Directive, the public are consulted / involved at all stages of the regulatory process, and need to be involved in this dry run.

**Facilitator(s)** – it is their role to chair the discussions between the regulators and the three operators: Turceni, Transgaz and Romgaz. They will ensure that all participants keep to time and to move the discussion to a conclusion as necessary. At the end of each of the three sessions, the main facilitator will chair a summary discussion in which participants reflect on the process and the lessons learnt.

**Your role as participant** – you are expected to be actively involved in the discussions concerning the CCS regulatory framework. Your points of view are expected with respect to the permitting of each of the three components of the CCS chain. These discussions should lead to clear conclusions with respect to the permitting process of CCS projects in Romania.

### Timings:

Day 1 (21 July 2011):

Session 1 – CO<sub>2</sub> Capture

Session 2 – CO<sub>2</sub> Transport

Summary of key findings identified during Day 1 of the Workshop

Day 2 (22 July 2011):

Session 3 – CO<sub>2</sub> Storage



### ANNEX NO. 3: FEEDBACK FORMS

<b>REGULATORY COMPONENT</b> CAPTURE <input type="checkbox"/> TRANSPORT <input type="checkbox"/> STORAGE <input type="checkbox"/>	<b>REGULATION NAME:</b>  	<b>ISSUES WHERE ADDITIONAL INFORMATION WAS REQUIRED TO MAKE AN ASSESSMENT:</b>  	<b>PROBLEMS ENCOUNTERED IN THIS REGULATORY COMPONENT:</b>  	<b>SOLUTIONS SUGGESTED / FOUND TO THESE PROBLEMS:</b>  
<b>COMPETENT AUTHORITIES INVOLVED:</b> ANRE <input type="checkbox"/> ANRM <input type="checkbox"/> ANPM <input type="checkbox"/> REPA Craiova <input type="checkbox"/> MECMA <input type="checkbox"/> Turceni City Hall <input type="checkbox"/> Labour Inspection <input type="checkbox"/>	<b>TIMELINE AGREED FOR COMPLETION OF REGULATORY COMPONENT:</b>  _____ WEEKS _____ MONTHS _____ YEARS			
<b>PUBLIC GROUPS INVOLVED:</b> NGOS <input type="checkbox"/> LOCAL COMMUNITY <input type="checkbox"/>	<b>HOW TO STREAMLINE PROCESS &amp; TIMELINE?</b>  	<b>AREAS OF PRESSURE (GAPS, UNCERTAINTIES, OVERLAPS, DUPLICATION WITH OTHER REGIMES?)</b>  	<b>OBSERVATIONS ON THE PROCESS:</b> <b>WHAT WORKED WELL &amp; HOW?</b>   <b>WHAT COULD BE IMPROVED?</b>	





## ANNEX NO. 4: SUMMARY OF DELEGATE COMMENTS

This section of the report is based entirely on the notes made *on no name basis* by the participants on the feedback forms made available during the CCS Workshop. For this section, Salans' role is limited to translating from Romanian to English and consolidating these notes. As a general remark, differences of nuances may occur because of translation from Romanian to English.

Please note that some of the notes were irrelevant/inconclusive for the purpose of the CCS Regulatory Toolkit Test (*e.g.*, remarks relevant exclusively for Getica CCS Application) and therefore were not taken into consideration in the process of consolidating the information in the feedback forms.

### 1.1 Workshop 1 – Capture

#### 1.1.1 Timeline for completion

Participants highlighted that, as a matter of principle, the estimated timeline should also consider the time required for the operator to prepare the documentation, as well as any amendments requested by the environmental authorities, and for undertaking all public involvement steps of the permitting process.

It has been estimated that the environmental agreement should be obtained within fourteen weeks, at a minimum. Nevertheless, the entire procedure should not overcome one year. The environmental permit should be obtained in approximately sixteen weeks.

#### 1.1.2 Additional information

The following additional information was noted as required in order to make an assessment:

- (a) technical aspects of the project, such as detailed presentation of the CO<sub>2</sub> capture process, and location of the CO<sub>2</sub> capture facilities;
- (b) identification of the chemical substances used in the capture process and their technological flow; specifying whether hazardous substances can be released during the capture process; and
- (c) monitoring and recording the parameters of the capture facility and what influences these parameters.

#### 1.1.3 Regulatory issues

The following problems were identified in the regulatory regime by participants:

- (a) little guidance available to public authorities on CCS capture technological considerations and environmental implications;
- (b) environmental monitoring during construction but especially during operation;
- (c) environmental authorities are reliant on the information in the application submitted by the operator;
- (d) lack of transparency and public engagement from the beginning may lead to opposition to the CCS project;



- (e) the debate whether CCS projects should be analyzed as a whole or divided in 3 (three) phases;
- (f) because of the capture technology not being sufficiently tested, the assimilation to a chemical plant is an exaggeration;
- (g) the CCS legislation needs to be further developed; and
- (h) CCS projects shouldn't have any preferential treatment; legislative changes should take into account other sectors too.

#### 1.1.4 Suggested solutions

The following suggested solutions to problems encountered with the regulatory regime were noted by participants:

- (a) the experience of other countries in this field should be analyzed;
- (b) making available various details for the stakeholders;
- (c) unique methodology for issuing environmental agreements and permits; and
- (d) "in corpore" application for all project components.

#### 1.1.5 Suggestions for streamlining the process

The following suggestions were made for streamlining the process:

- (a) agreements/permits applications should be made well in advance of the timeframe envisaged for beginning construction/operation;
- (b) each phase of the CCS chain should be presented to the public authorities in a clear and concise manner;
- (c) the documents supporting the application should be drafted in close compliance with applicable legal provisions;
- (d) the public should be informed before starting the environmental procedures; the information presented to the public should be brief but concise;
- (e) close cooperation between operators and local authorities;
- (f) presentation of full documentation in order to obtain approvals and agreements for construction stage and then for operating stage; for operation, water management permits can be obtained for each of the three components of the CCS chain;
- (g) unique approvals/agreements/authorizations for the three components of the CCS chain;
- (h) posting on RAEP Craiova and operator's website the necessary information in order to allow the public to become aware of it; and
- (i) collaboration between public authorities in order to reduce the negative impact of bureaucracy.



### 1.1.6 Areas of regulatory uncertainty

The following areas were noted by participants as causing some uncertainty in the regulatory regime:

- (a) information about the project;
- (b) lack of extensive experience with CCS projects;
- (c) lack of training of the employees of the public authorities; and
- (d) which public authority evaluates risks and establishes measures to eliminate and reduce risks.

### 1.1.7 Observations on the process – what worked well and how?

- (a) collaboration between participants;
- (b) exchange of ideas and views; and
- (c) constructive dialogue.

### 1.1.8 What could be improved?

- (a) use of information and experience of other countries (*e.g.*, Scotland, Spain, Germany);
- (b) public information campaigns;
- (c) the collaboration between public authorities;
- (d) the debate process should be equitable for all the actors so that each of them could express its opinion;
- (e) the dialogue with the relevant local authorities involved in the permitting process as per the urbanism certificate;
- (f) involvement of the Ministry for the Environment and Forests in the establishment of uniform methodology for obtaining environmental permits or agreements;
- (g) bureaucracy could be reduced;
- (h) dissemination of information in a gradual fashion depending on the target audience;
- (i) effective use of structural funds for the development of the institutional capacity; and
- (j) discussions should have led to stronger conclusions and action plans on behalf of the local authorities involved.

## 1.2 Workshop 2 – Transport

### 1.2.1 Timeline for completion

Participants estimated that the timeline for the completion of the permitting of the transport component may range from one to two years.

### 1.2.2 Additional information

The following additional information was noted as required in order to make an assessment:

- (a) information on the route and technical specifications of the pipeline;
- (b) measures contemplated for the stability of hydro technical works to be traversed by pipelines;
- (c) presence of protected areas along the pipeline route;
- (d) environmental impact assessment that would reveal the associated risks;
- (e) whether a Zonal Regional Spatial Plan is necessary or not;
- (f) impact of construction phase;
- (g) behavior of pipelines in case of emergencies or interruption of service and environmental impact;
- (h) the impact of the pipeline route on the safety areas of groundwater resources;
- (i) disbursements in case of expropriations;
- (j) waste management during construction phase; and
- (k) establishing the legal regime of the underground of the land traversed by the transport pipeline.

### 1.2.3 Regulatory issues

The following problems were identified in the regulatory regime by participants:

- (a) the legal regime of the land affected by the route of the transport pipeline should be clarified;
- (b) securing the route of the transport pipeline;
- (c) means for technically and physically securing the pipes;
- (d) the strategy for expropriations, if necessary, which can lead to increased construction costs;
- (e) inclusion of the pipeline route in the Zonal Regional Spatial Plan;
- (f) the transport route is closely related to the identification of the storage site which influences the strategy for expropriations; therefore, the characterization of the storage site is very important;
- (g) the legal obligations towards the owners affected by the route of transport pipeline in case no expropriations are envisaged; and
- (h) the maximum required time in order to remedy damages/interruption of service of transport pipeline.

### 1.2.4 Suggested solutions

The following solutions were suggested to the problems encountered with the regulatory regime:

- (a) pipelines should be installed at a optimum depth;
- (b) frequent monitoring points;



- (c) early notice to landowners and public debates in order to avoid speculative transactions with the land affected by pipeline;
- (d) declaring the project as a project of national interest;
- (e) involvement of the Ministry of Economy and of the Ministry of Environment and Forests to coordinate the permitting process;
- (f) individual approach for each component of the CCS chain;
- (g) the transport route should avoid the protected areas and watercourses; and
- (h) the construction material of the pipeline should also consider the type of soil.

#### 1.2.5 Suggestions for streamlining the process

The following suggestions were made for streamlining the process:

- (a) collaboration/constructive dialogue between the beneficiary and the relevant authorities;
- (b) the CCS chain should be analyzed as a whole and not each component separately;
- (c) transparent and open debates offering the possibility for each actor to express its opinion;
- (d) information regarding the experience of other states which have developed pilot CCS projects;
- (e) identification of the localities and counties which will issue approvals/permits in the construction phase and which do not have General Urban Plan, Zonal Urban Plan or other plans that the construction approvals/permits are dependent on;
- (f) applications should be prepared in accordance with legal provisions and additional requests made by relevant authorities;
- (g) collaboration between authorities;
- (h) limitation of bureaucracy;
- (i) preliminary discussions with the operator before submitting applications; and
- (j) regulations should be improved in order to facilitate the authorization of the entire CCS chain.

#### 1.2.6 Areas of regulatory uncertainty

The following areas were noted by participants as causing some uncertainty in the regulatory regime:

- (a) whether the project should be declared of national interest considering that the operator is a private company (although the Romanian State is the majority shareholder);
- (b) the characterization of the storage site because of its implications on the route of the transport route;
- (c) needed improvement of institutional capacity and of understanding of technology and applicable legislation;
- (d) population in the area of the transport pipeline; and

- (e) overlapping regulations on an institutional level.

#### 1.2.7 Observations on the process – what worked well and how?

Participants noted that the Workshop created a perfect climate for a transparent public debate. They ranked as positive the initiative of debating the CCS regulatory framework ahead of initiating CCS projects.

#### 1.2.8 What could be improved?

- (a) the participants concluded that a better cooperation between the authorities is desirable; also, the bureaucracy should be limited and it may be useful if the information concerning the Demonstrative Project CCS would be disseminated to the relevant environmental authorities; and
- (b) the key findings of the Workshop should have materialized into commitments of the relevant authorities to resolve the issues identified in order to avoid “the debate must go on” approach.

### 1.3 Workshop 3 – Storage

#### 1.3.1 Timeline for completion

Participants estimated between one to two years as necessary for completing the permitting process of storage component of CCS chain.

#### 1.3.2 Additional information

The following additional information was noted as required in order to make an assessment:

- (a) environmental impact of CO<sub>2</sub> storage;
- (b) site characterization to determine injection points;
- (c) existence of constructions which are subject to fire safety approval/authorization (constructions exceeding 600 square meters);
- (d) more complex geological, hydro-chemical and hydro-geological studies;
- (e) CO<sub>2</sub> injection should not affect underground water; and
- (f) seismic risks assessment.

#### 1.3.3 Regulatory issues

The following problems were identified in the regulatory regime by participants:

- (a) CCS secondary legislation should be developed;
- (b) correct analysis of the mineral content of the soil and sealing the walls of the storage reservoir to avoid the “migration” of the stored CO<sub>2</sub>;
- (c) technological methods for sealing the walls of the CO<sub>2</sub> storage reservoir;
- (d) CO<sub>2</sub> storage is still new and not “mainstream” technology;
- (e) reduced institutional capacity of the authorities and lack of experience;

- (f) the long periods of time for the award of the drilling approvals by NAMR;
- (g) the adequacy of the storage sites and identification of all potential issues; and
- (h) lack of sufficient and certain geological data.

#### 1.3.4 Suggested solutions

The following solutions were suggested to the problems encountered with the regulatory regime:

- (a) “in corpore” application for all project’s components;
- (b) hydro-geological studies necessary in order to avoid the damage caused to watersheds, groundwater;
- (c) assessment of the geological layers to determine whether they are safe for CO<sub>2</sub> storage;
- (d) effective collaboration between authorities;
- (e) specialized structure for the elaboration of specific procedures;
- (f) there are necessary different assistance programs in order to strengthen institutional capacities of NAMR;
- (g) correct interpretation of results and adoption of best available solutions;
- (h) training and information;
- (i) elaboration and publication of a glossary; and
- (j) study of Management Plan of Jiu Watershed.

#### 1.3.5 Suggestions for streamlining the process

The following suggestions were made for streamlining the process:

- (a) decrease in bureaucracy;
- (b) the relevant authorities should limit their requests to those provided under applicable legislation;
- (c) dynamic involvement of all authorities involved in the decision making process;
- (d) more meetings in order to solve problems encountered;
- (e) running in parallel as many activities as possible;
- (f) use of the experience of other countries in dealing with CCS; and
- (g) dialogue and better collaboration between institutions.

#### 1.3.6 Areas of regulatory uncertainty

The following areas were noted by participants as causing some uncertainty in the regulatory regime:





- (a) needed improvement of institutional capacity and of understanding of technology and applicable legislation;
- (b) very short terms for the elaboration of the secondary procedures; and
- (c) institutional capacity of ANRM in order to make possible the elaboration of the related secondary legislation.

1.3.7 Observations on the process – what worked well and how?

- (a) dialogue between participant authorities; and
- (b) effective identification of the problems.

1.3.8 What could be improved?

Participants noted that it should be paid more attention to limiting the bureaucracy, to communicating with the public and to an open relation between the parties involved in the CO<sub>2</sub> storage procedure. Participants considered that the authorities should have reached some common grounds on the matters that they agreed that represent a problem.