



GETICA CCS DEMO PROJECT ROMANIA

CCS PROJECTS IN EUROPE - DIALOG WITH THE DIPLOMATIC REPRESENTATIVES IN ROMANIA
= *FROM DEBATES TO ACTIONS* =

Gabriel Ignat, Project Manager, Project Management Department - ISPE



Why CCS in Romania?

Inter alia

Because

- ✓ To reach 2020 EU targets of making CCS commercial we need to promote **both onshore and offshore projects**
- ✓ **Romania** has preliminary identified around **23 Gt onshore CO2 storage geocapacities** (17Gt in saline aquifers and 4Gt in depleted oil&gas reservoirs)
- ✓ **Romania** has more than **150 years** of history in the **oil and gas** industry, and currently operating natural gas reservoirs
- ✓ **Maintaining operational the PPs** running on fossil fuels (41% indigene coal and 12% hydrocarbons) and the **mining sites exploitations** has a **positive economic & social impact** for Romania
- ✓ It will **contribute** by the power of example to the **CCS deployment in the South-East European region**



Project Company



Technical Consortium



Technical Support





Electricity Generation by Primary Energy Sources



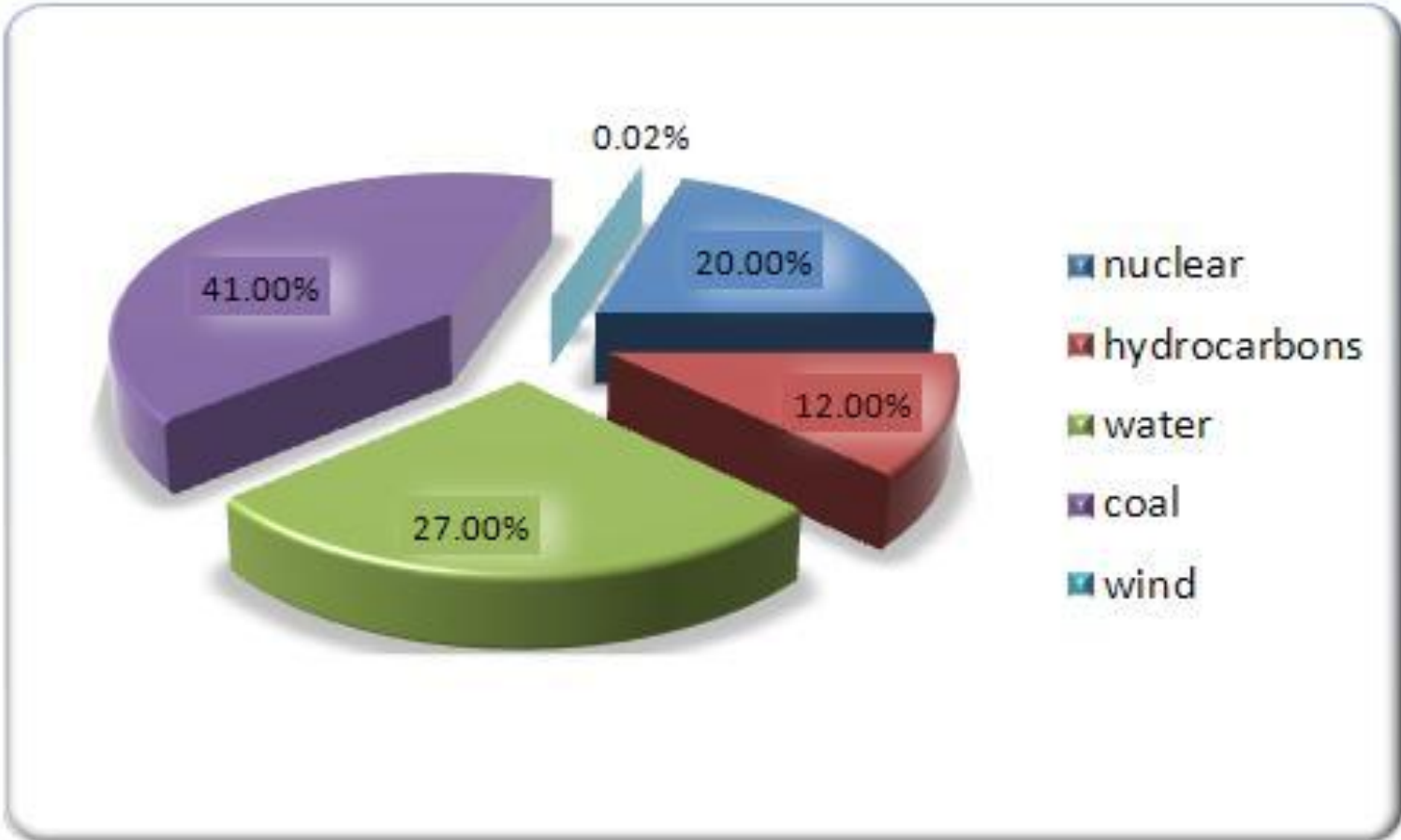
Project Company



Technical Consortium



Technical Support





CO2 Emissions and Storage Capacity in Romania



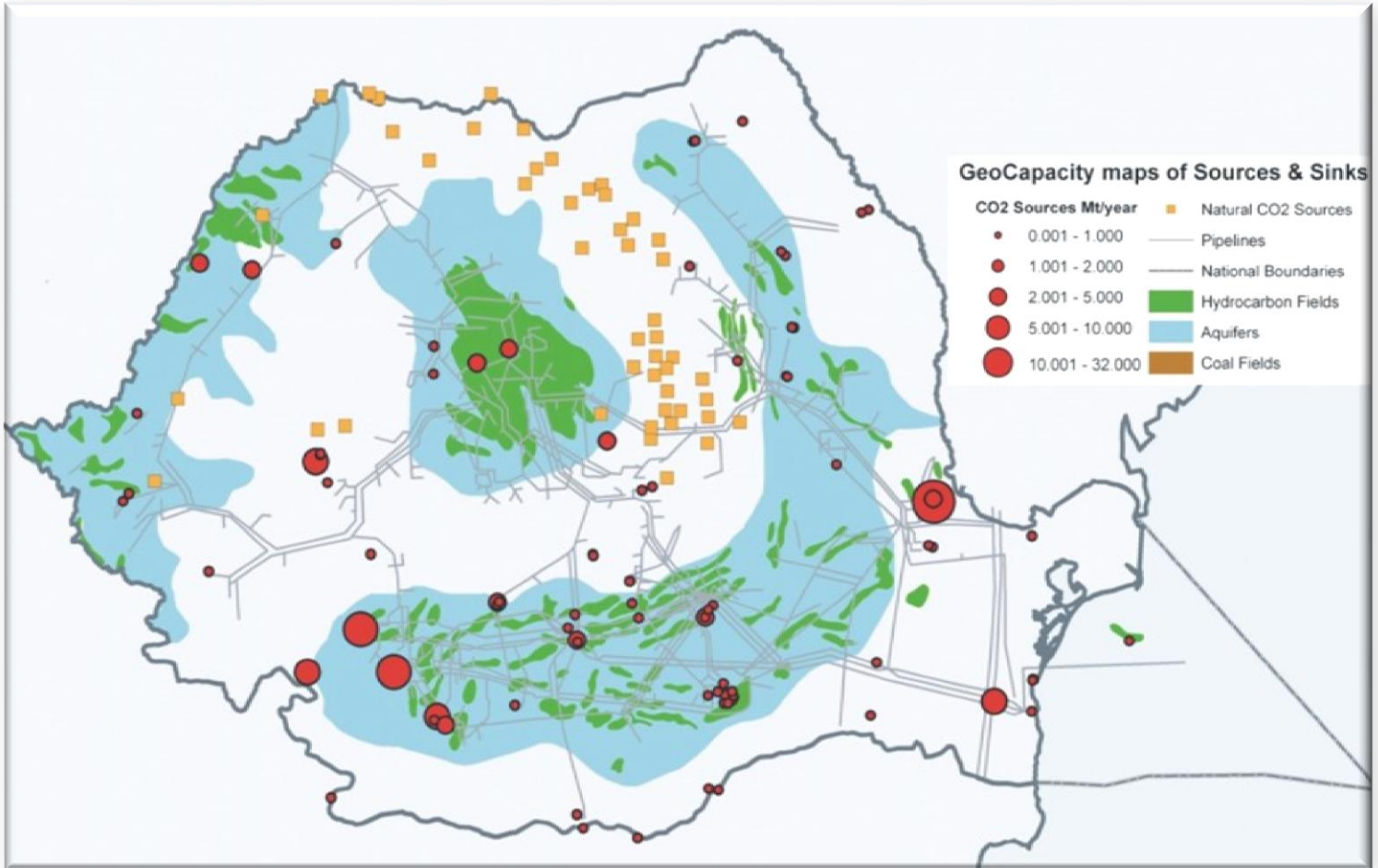
Project Company



Technical Consortium



Technical Support





Knowledge Sharing Activities 2001-2010



Project Company



Technical Consortium



Technical Support



2001	GeoEcoMar affiliation to ENeRG
2006	GeoEcoMar affiliation to CO ₂ Net
2007	<ul style="list-style-type: none"> ▪ “CO₂ Club” Association was founded ▪ GeoEcoMar representation in ZEP - GG
2008	<ul style="list-style-type: none"> ▪ ISPE representation in ZEP - AC ▪ <i>First International Workshop “Promoting CCS in Romania”</i> – Bucharest
2009	<ul style="list-style-type: none"> ▪ CIEM - <i>International Conference on Energy and Environment “CCS Round Table”</i> – Bucharest ▪ FENCO ERA NET – CCS impact on communication
2010	<ul style="list-style-type: none"> ▪ <i>Second International Workshop “Promoting CCS in Romania”</i> – Bucharest ▪ FOREN – <i>Regional Energy Forum “CCS International Workshop”</i> – Neptun ▪ GeoEcoMar participating in CGS Europe / FP7 ▪ Romanian CCS Demo Project accepted as observer in CCS - EU Project Network ▪ <i>First Knowledge Sharing Event on “CCS National R&D Program”</i> – Târgu Jiu ▪ Official announcement of Romania candidacy to NER300 competition





Knowledge Sharing Activities in 2011

	Events	Other activities
January	ZEP Governmental Communicators Meeting	
February	Coal Gen Europe 15-17 February, Prague, Czech Republic	
	ZEP Governmental Communicators Call-in conference	
March		“Science in appropriate words” - Radio Romania Cultural interviews dr. Constantin S. SAVA, GEOECOMAR March 09
	Climate change – impact and solutions, brief presentation at Turceni High School 1 day, March 11, Turceni, Gorj county	
		Radio Romania Cultural, Science editorial, “Science at home” interviews dr. Constantin S. SAVA, GEOECOMAR March 15, 45 minutes
	CCS Projects in Europe – dialog with the diplomatic environment in Romania 1 day Business Meeting, 29 March, 35-40 part. Bucharest	On-line Platform GETICA CCS and Knowledge Sharing



Project Company



Technical Consortium



Technical Support





Knowledge Sharing Activities in 2011

	Events	Other activities
April	European Sustainable Energy Week	Animation movie GETICA CCS
	GETICA CCS - Open Door Event 1 day knowledge sharing event, 14 April, 80-100part in Turceni TPP, Gorj county	Social Survey in Oltenia region
May	CCS – horizon 2020 1 day Round Table, 12 May, 70 part, Bucharest SAVE THE DATE!	
	GETICA CCS - CO2 Transport & Storage Transgaz & Romgaz, 1 day CO2 Transport & Storage event, 70-80part, Medias	
September	CLUB CO2 "Promoting CCS in Romania" Third International Conference, 1 day event, 60-70part., Craiova, Dolj county	
October	Romanian CCS roadmap 1 day Final National Conference, 100part, Bucharest	
November	International Congress on Energy & Environment 1 day CCS Round Table, 4 November, 50part, Bucharest SAVE THE DATE!	



Project Company



Technical Consortium



Technical Support



Romanian Governmental Actions

<p>July, 2009</p>	<p><i>Action Plan to prepare Romania for the “Energy-Climate Change”</i> EU legislative package implementation (co-initiated by METBE, MEF, MPF, MERYS and signed by the Prime Minister)</p>
<p>February, 2010</p>	<p>Action Plan for implementing a Demo Project regarding the Carbon Capture and Storage in Romania (initiated by METBE and signed by the Prime Minister)</p>
<p>April, 2010</p>	<p>METBE launched the call for proposals to industries for the national ranking</p>
<p>May, 2010</p>	<p>The Romanian CCS Demo Project was selected from the energy industry</p>
<p>August, 2010</p>	<ul style="list-style-type: none"> ▪ METBE contracted the National CCS R&D Program ▪ METBE established the CCS Demo Project Inter-Ministerial Steering Committee through the Order no. 1508
<p>2011</p>	<ul style="list-style-type: none"> ▪ Transposing the EU Directive related to CCS ▪ Founding the future CCS Project Company as the Romanian CCS Demo Project Sponsor ▪ GETICA CCS Demo Project financing



Project Company



Technical Consortium



Technical Support





EC/31/2009 CCS Directive transposition



Project
Company



Technical
Consortium



Technical
Support



✓ In Romania the CE/31/2009 CCS Directive is promoted under the Ministry of Environment and Forestry and Ministry of Economy, Trade and the Business Environment co-initiative

✓ It was decided to be transposed first through an Emergency Order

✓ The Competent Authority will be the existing National Agency for Mineral Resources - NAMR





Project Location



South-West Oltenia Development Region



GETICA CCS Demo Project – in brief

GETICA CCS is a Governmental Demo Project, officially sustained by the Prime Minister and coordinated by the Ministry of Economy, Trade and the Business Environment – METBE and supported by Global CCS Institute.

<h2>Location</h2>	<ul style="list-style-type: none"> ▪ Oltenia region – the most energy intensive ▪ Turceni PP – Unit no.6 (330MW)
<h2>Full Chain</h2>	<ul style="list-style-type: none"> ▪ CO₂ Capture Plant & Compression (1.5Mtpa) ▪ CO₂ Transport – onshore pipeline ▪ CO₂ Storage – onshore deep saline aquifers
<h2>Sponsor</h2>	<p>GETICA CCS Project Company (PC), including:</p> <ul style="list-style-type: none"> ▪ TURCENI Energy Complex – future CO₂ Capture Plant operator and PC Leader ▪ TRANSGAZ, National Company for Natural Gas Transport – future CO₂ Transport Infrastructure operator and PC Member ▪ ROMGAZ, National Company for Natural Gas Exploitation – future CO₂ Storage Facility operator and PC Member
<h2>Current Status</h2>	<ul style="list-style-type: none"> ▪ Final phase of the Feasibility Study ▪ NER300 Application Forms was submitted on 9th of February to the Romanian Government - METBE



Project Company



Technical Consortium



Technical Support





Turceni PP Layout



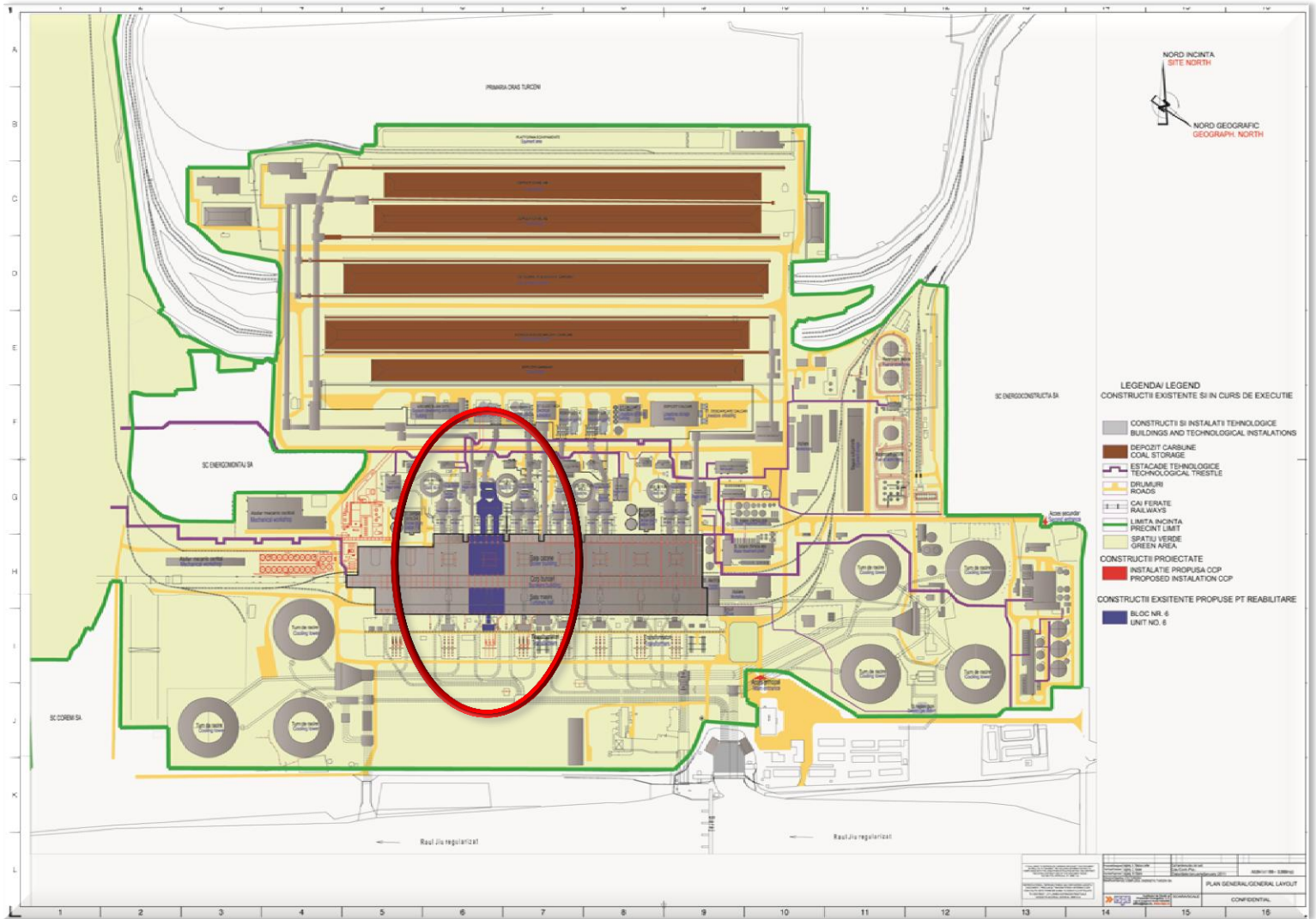
Project Company



Technical Consortium



Technical Support





Turceni PP – Unit no. 6 (330MW)

- undergoing **retrofitting process** – deadline 2013
- **FGD** system – deadline 2012
- **ash and slag “dense slurry”** system – deadline 2012



Project Company



Technical Consortium



Technical Support



Main technical features after retrofitting

Steam Turbine + Electric generator

Rated gross power	330MW
Maximum long term available gross power	310MW
Annual average gross power	280MW

Steam Boiler

Steam flow	1035t/h
Steam parameters (pressure / temperature)	192 / 540 bar / °C
Efficiency	88%





CO₂ Capture

- post-combustion system
- 85% minimum efficiency
- chilled ammonia process
- future operator: **Turceni Energy Complex**



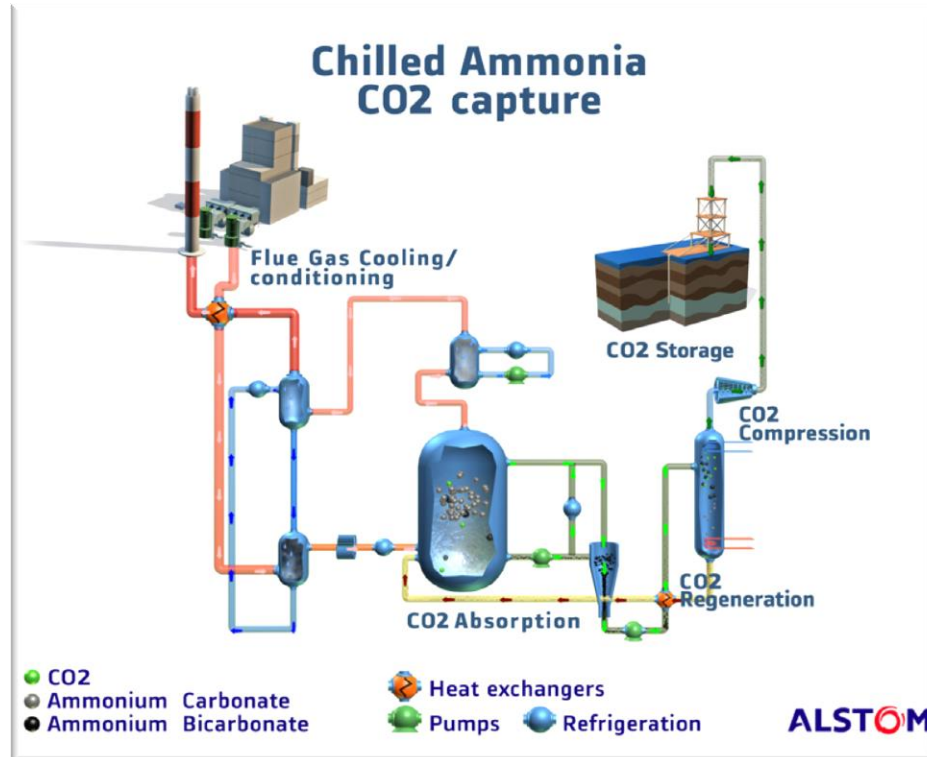
Project Company



Technical Consortium



Technical Support





CO₂ Transport



Project Company



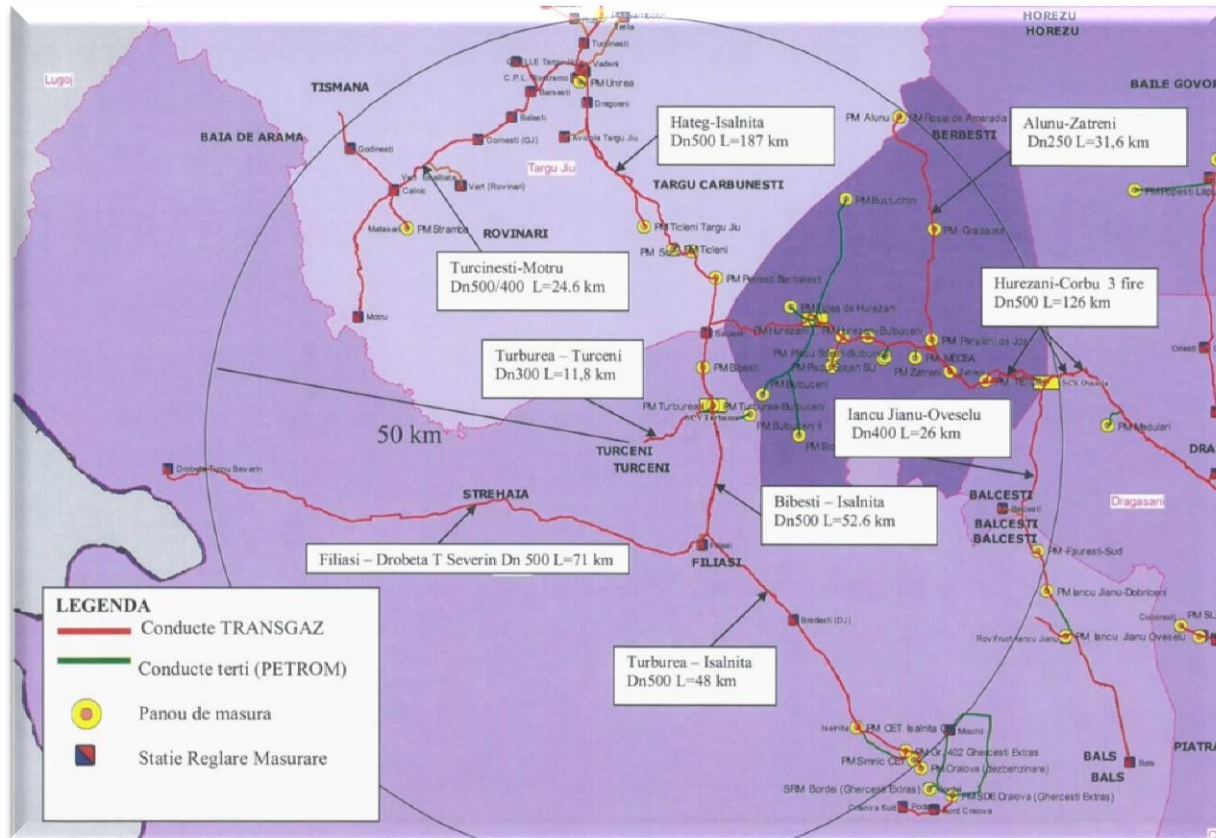
Technical Consortium



Technical Support



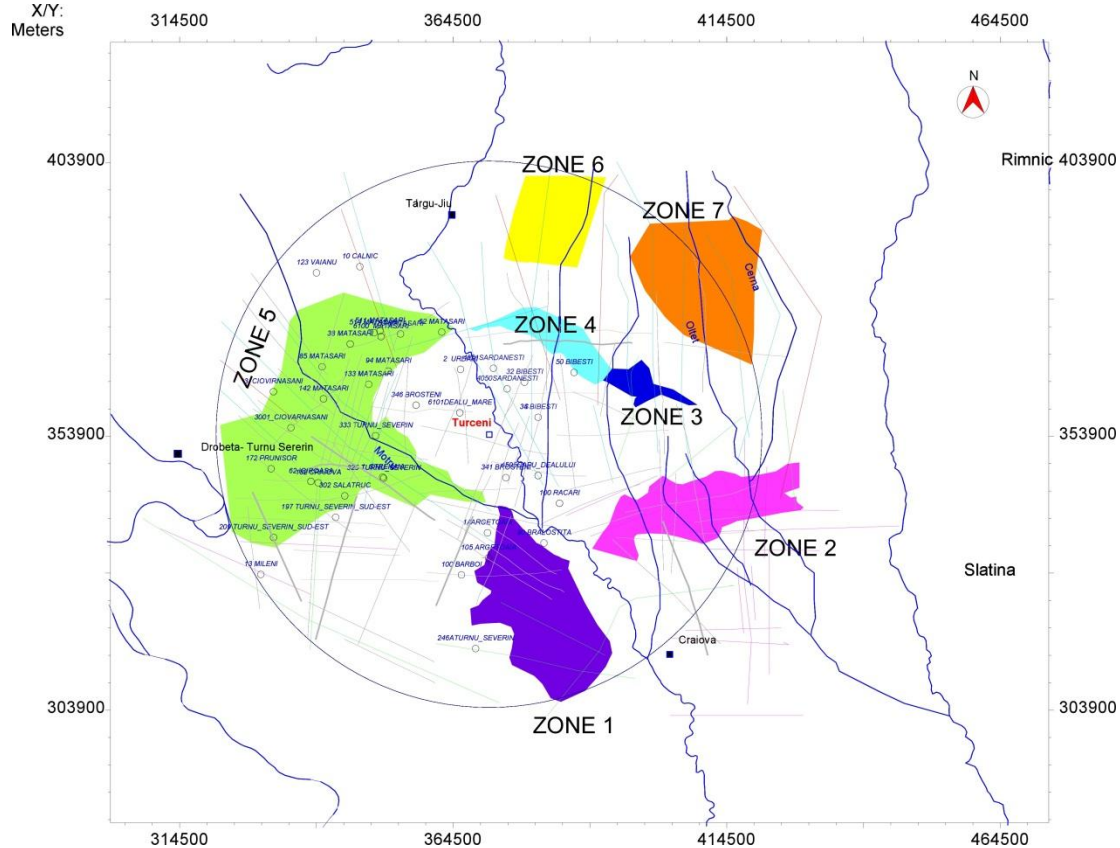
- onshore pipeline of 40km length
- future potential development: Rovinari PP (1300MWe), Craiova II CHPP (300MWe), *Işalnița CHPP* (600MWe), Petro-chemical and Metallurgical industries
- future operator: **Transgaz** - National Company for Natural Gas Transportation





CO₂ Storage

- area of investigations within a radius of 50km around Turceni PP
- 7 potential CO₂ storage sites in onshore deep saline aquifers
- multi-user hub development potential
- future operator: **Romgaz** - National Company for Natural Gas Exploitation



Project Company



Technical Consortium



Technical Support



ENINVEST



Project Company



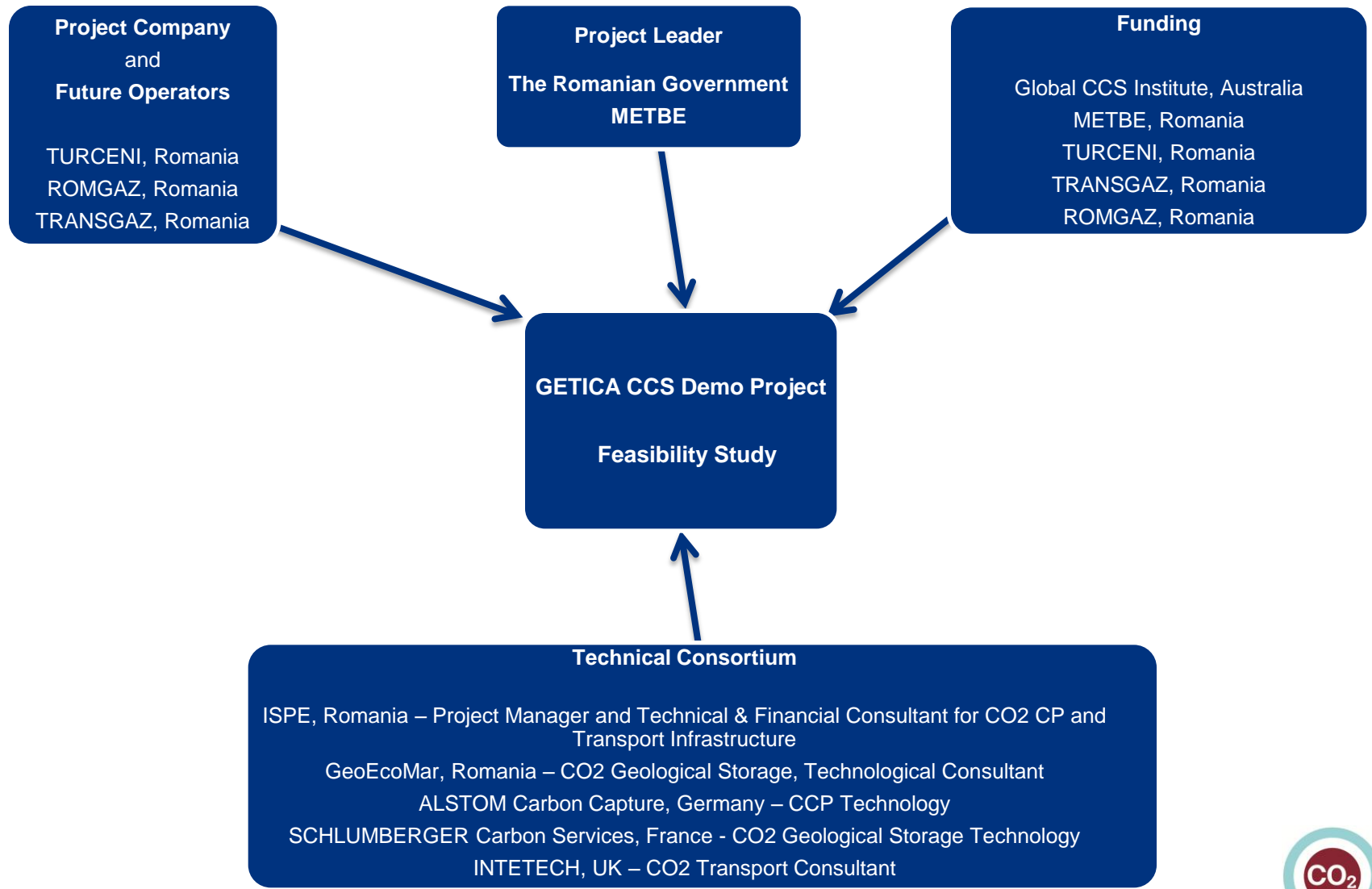
Technical Consortium



Technical Support



GETICA CCS - Key Players





Prospected Financing Sources

- ✓ NER 300 Program
- ✓ Norwegian Financial Mechanism
- ✓ EEA Financial Mechanism
- ✓ EU Structural Funds (2013 ÷ 2020)
- ✓ EU-ETS auctioning
- ✓ EIB (Risk – Sharing Financing Facility)
- ✓ USA Government Support
- ✓ Operators (Turceni , Transgaz, Romgaz)
- ✓ National Public Sources (feed-in-tariff)
- ✓ Other sources (commercial loans)



Project
Company



Technical
Consortium



Technical
Support



Institutional
& Financial
Support



Project
Company



Technical
Consortium



Technical
Support



WE STAND FOR THE DEVELOPMENT OF CCS PROJECTS IN ROMANIA



**Thank You for
your Attention !**

Gabriel Ignat
Project Manager

ISPE
Project Management
Department

T +4021 2061400
gabriela.ignat@ispe.ro

