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# CCS technology in ROMANIA

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sustainability  
competency  
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tradition  
efficiency  
responsibility



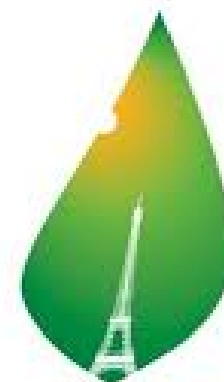
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UEFISCDI, Bucharest October 2017

# Background

IEA is stating in its 2016 Report “20 years of CCS – accelerating future deployment” that:

1. CCS continues to be essential
2. Deployment of CCS will not be optional in implementing the Paris Agreement



**PARIS2015**  
CONFÉRENCE DES NATIONS UNIES  
SUR LES CHANGEMENTS CLIMATIQUES  
COP21·CMP11

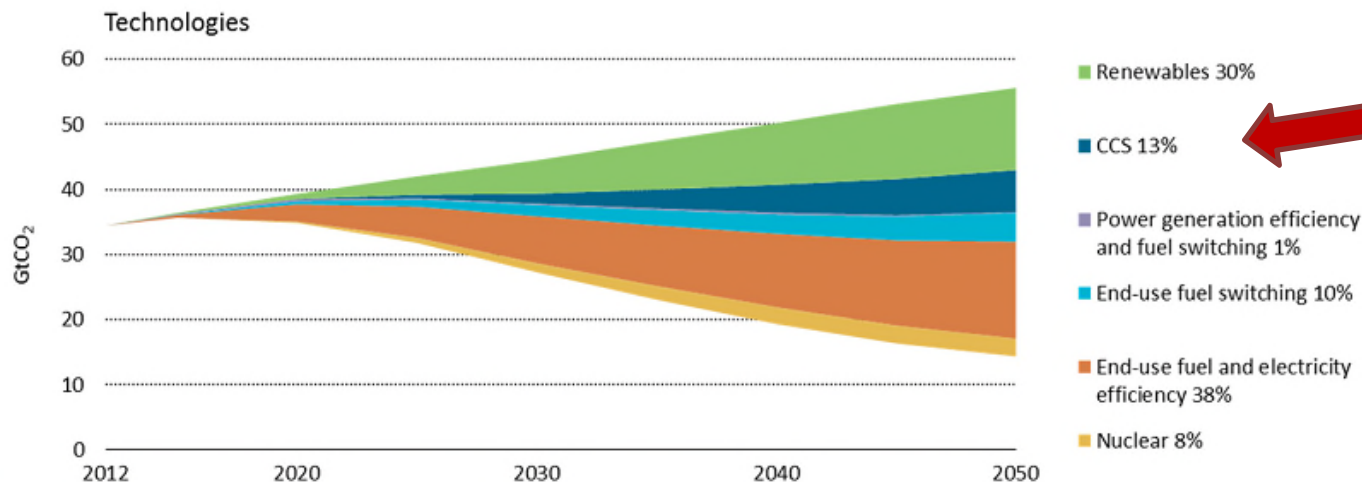


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# CCS contribution to -1,5 dgr.C

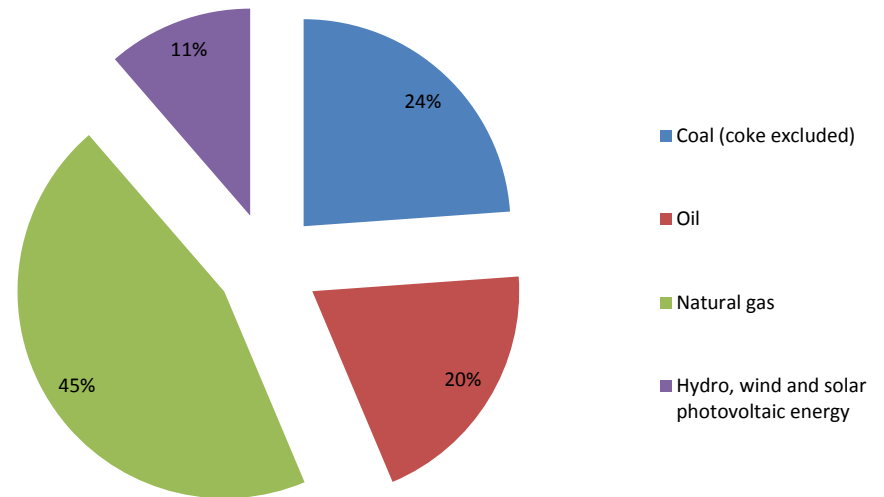
- ✓ CCS could deliver 13% of the cumulative emissions reductions needed by 2050
- ✓ 15 large-scale facilities around the world capturing 27 million tonnes (Mt) of CO<sub>2</sub> every year, and 7 expected to come online by 2018



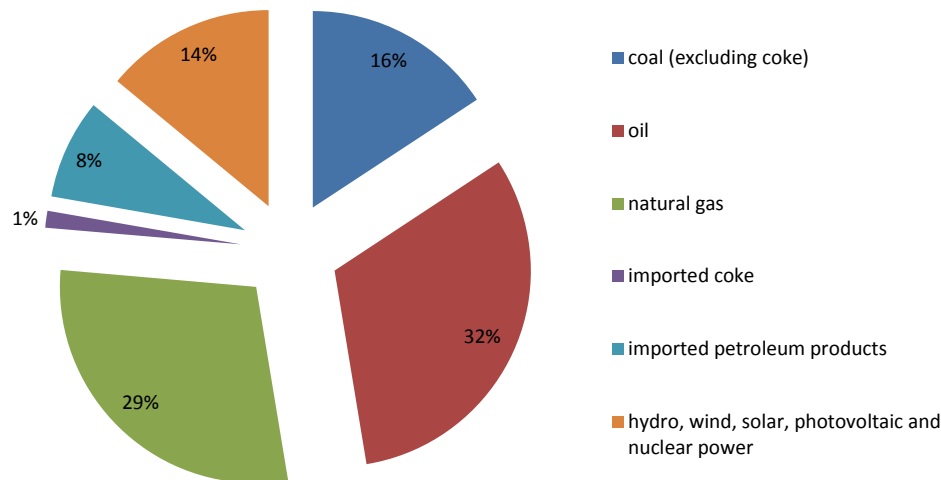
Source: IEA Energy Technology Perspectives 2015

# Energy mix

## Production of the main primary energy carriers 2015



## Primary energy resources 2015



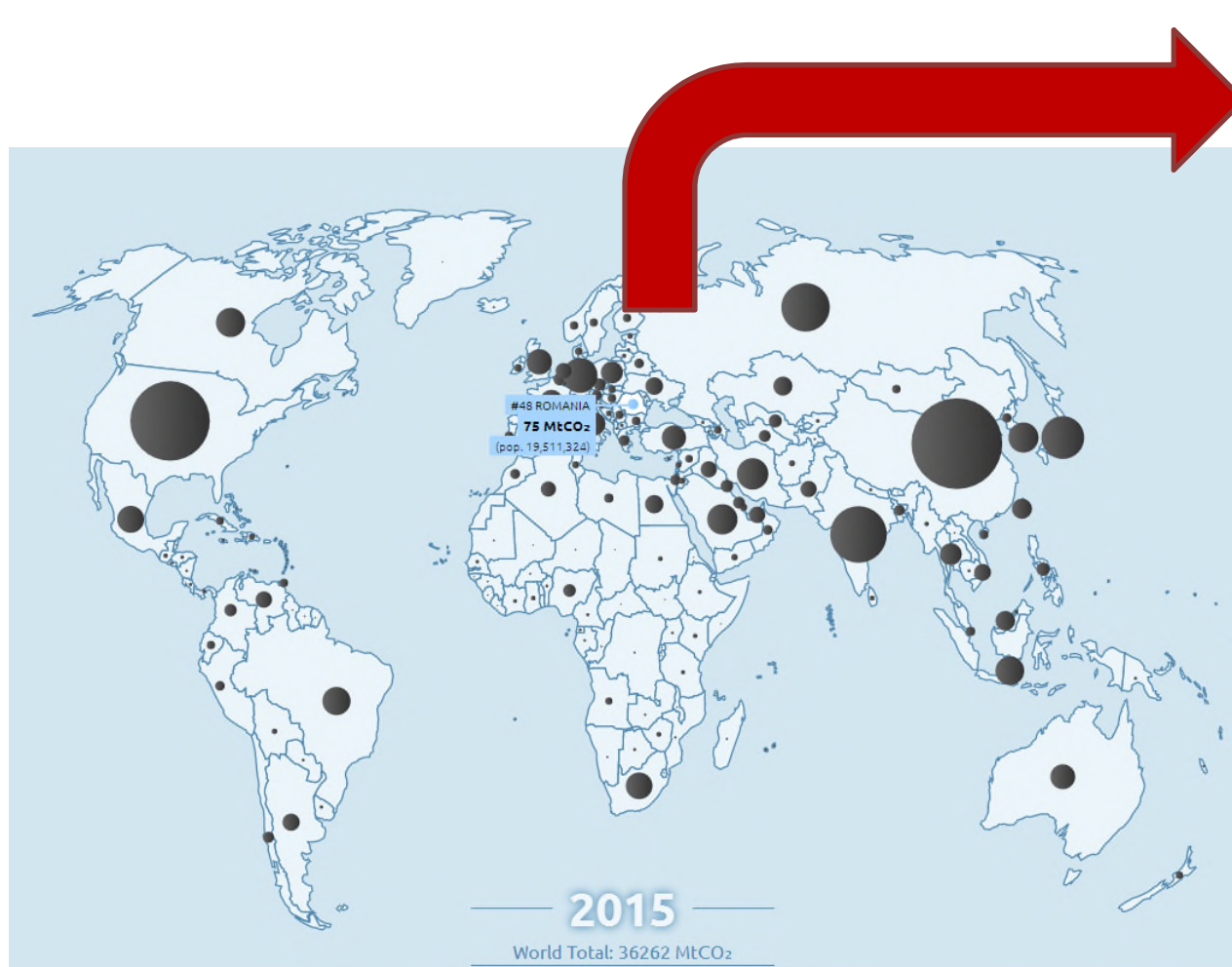
in ROMANIA



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# CO<sub>2</sub> footprint



## ROMANIA

48 country at global level

75 Mtpa CO<sub>2</sub>  
3,8 tCO<sub>2</sub>/pers. in 2015

## UE

5564 Mtpa CO<sub>2</sub>  
7,5 tCO<sub>2</sub>/pers. in 2015

# GETICA CCS Demo Project – in brief

<b>Location</b>	<ul style="list-style-type: none"><li>✓ <b>Oltenia region</b> – the most energy intensive responsible of about 40% of total national CO2 emissions</li><li>✓ <b>Turceni PP</b> – Unit no.6 (330MW)</li></ul>
<b>Full chain</b>	<ul style="list-style-type: none"><li>✓ <b>CO2 Capture Plant &amp; Compression</b> (1.5Mtpa)</li><li>✓ <b>CO2 Transport</b> – onshore pipeline</li><li>✓ <b>CO2 Storage</b> – onshore deep saline aquifers</li></ul>
<b>Sponsor</b>	<p><b>GETICA CCS Project Company (PC)</b>, including:</p> <ul style="list-style-type: none"><li>✓ <b>OLTENIA Energy Complex</b> – future CO2 Capture Plant operator and PC Leader</li><li>✓ <b>TRANSGAZ</b>, National Company for Natural Gas Transport future CO2 Transport Infrastructure operator and PC Member</li><li>✓ <b>ROMGAZ</b>, National Company for Natural Gas Exploitation – future CO2 Storage Facility operator and PC Member</li></ul>
<b>Current status</b>	<ul style="list-style-type: none"><li>✓ <b>Feasibility Study and Permitting Reports</b> – final</li></ul>



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# GETICA CCS – main features



**Capture:** post-combustion system

- ✓ minimum efficiency: 85%
- ✓ chilled ammonia CO<sub>2</sub> absorption
- ✓ CO<sub>2</sub> reduction > 1.5 mil. tonnes/year

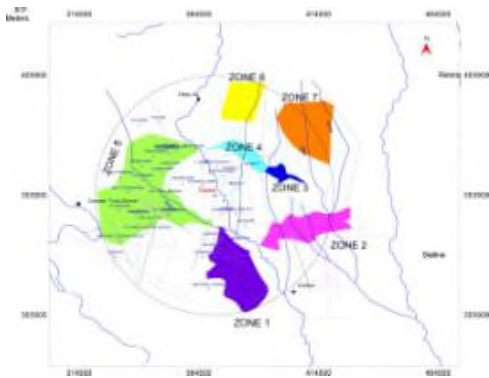
**Transport:** onshore underground pipeline

- ✓ Length: 40 km
- ✓ DN 350mm (14") / 80÷120 bar / 0÷40°C
- ✓ Flow: max. 238 tCO<sub>2</sub>/h, min. 119 tCO<sub>2</sub>/h



**Storage:** onshore deep saline aquifers

- ✓ Two potential storage sites 50 km around Turceni PP
- ✓ Storage capacity >100 mil. tCO<sub>2</sub> each site
- ✓ multi-user storage hub development potential



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# CCS technology in Romania

## NATIONAL LEGAL FRAMEWORK – current status

- ✓ GD no.64/2011 and Law no.114/2013 on carbon geological storage
- ✓ Decision no.5/2015 for approving the Procedure on issuing exploration permits for carbon geological storage
- ✓ Law no.114/2013 enforcement rules – underway
- ✓ National CCS responsible institutional entity – NAMR (National Agency for Mineral Resources)

## Next steps

- ✓ Accelerating the R&D related projects; examples of ongoing international cooperation:
  - ACT ERA.NET (GeoEcoMar; Babes Bolyai University of Cluj-Napoca)
  - H2020 (GeoEcoMar “ENOS” project)
- ✓ Identification of funding resources
- ✓ GETICA CCS to be nominated as: project of national and regional strategic importance
- ✓ Launching the public awareness campaign
- ✓ Enhancing the institutional capacity and competences
- ✓ Delivering ESIA, FEED and the International Tender documentation
- ✓ Procurement process, permitting, land acquisition, construction, commissioning
- ✓ O&M, monitoring and decommissioning



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# What should be done?

## VIABLE COMMERCIAL FRAMEWORK

- ✓ Ensuring the industry and business sectors' demand and interest for CCU, EOR / EGR and CCS
- ✓ Defining and securing key actors - energy, oil-gas, metallurgical, chemical, cement companies

## STIMULATIVE ECONOMIC-FINANCIAL FRAMEWORK

GETICA CCS Demo Project can become economically viable starting from ... USD/t CO<sub>2</sub>???

- ✓ Create an attractive financial environment for both businesses and the public
  - Subsidies for implementation
  - Other incentives (eg field allowances in UK)
  - Compensation for citizens affected by the transport and storage infrastructure
  - Creation of a green investment fund



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# Conclusions

**GETICA CCS is essential for:**

- ✓ **delivering significant emissions reductions from the use of fossil fuels in power generation and industrial processes**
- ✓ **ensuring the security and independency of energy supply, thus making a substantial contribution to reaching the target!**



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# Thank you for your attention!

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**Sources:**

- ✓ 20 years of CCS, IEA Report 2016
- ✓ Energy Technology Perspective, IEA Report 2015
- ✓ Carbon Capture and Storage: The solution for deep emissions reductions, IEA Report 2015
- ✓ Balanta energetica, INS 2015
- ✓ CO2 Price Forecast, Synapse's 2016
- ✓ Global Carbon Atlas

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