

Report on CCUS Activities in Romania

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CCUS for limiting global warming

Global efforts to reduce CO₂ emissions are needed and made in order to keep global warming below 1.5°C above pre-industrial levels. One of the most promising technologies that could reduce CO₂ emissions from the industry if it is implemented on a large scale is CO₂ capture, utilisation and storage (CCUS).

At the moment, large-scale implementation of CCUS faces the challenge of defining a viable business case which can be achieved through utilisation of captured CO₂ for EOR (Enhanced Oil Recovery) and EGR (Enhanced Gas Recovery) as well as the establishment of a transport infrastructure. The use of captured CO₂ for EOR (CO₂-EOR) has become a well-sustainable business in the United States having also an impressive pipeline network for CO₂ transportation.



World Energy Council
CONSEIL MONDIAL DE L'ENERGIE

2013 World Energy Issues Monitor

- Even with improvements in energy efficiency, we expect global energy demand to double by 2050.
- This is the inevitable consequence of global population growth, global economic growth, continued urbanization, as well as the resulting increased demand on mobility and other energy dependent services.
- During the same period we will need to reduce global greenhouse gas emissions by half if we want to keep a global temperature increase below two degrees Celsius.

Role of GeoEcoMar in promoting CCUS (I)

Work related to the CO₂ geological storage began with the affiliation of the institute to ENeRG in 2001 and continued with participation in national and international projects related to CCS (EU GeoCapacity, CO₂ NetEAST, CGS Europe and CO₂ Stop), culminating in becoming a member of the Global CCS Institute in 2010.

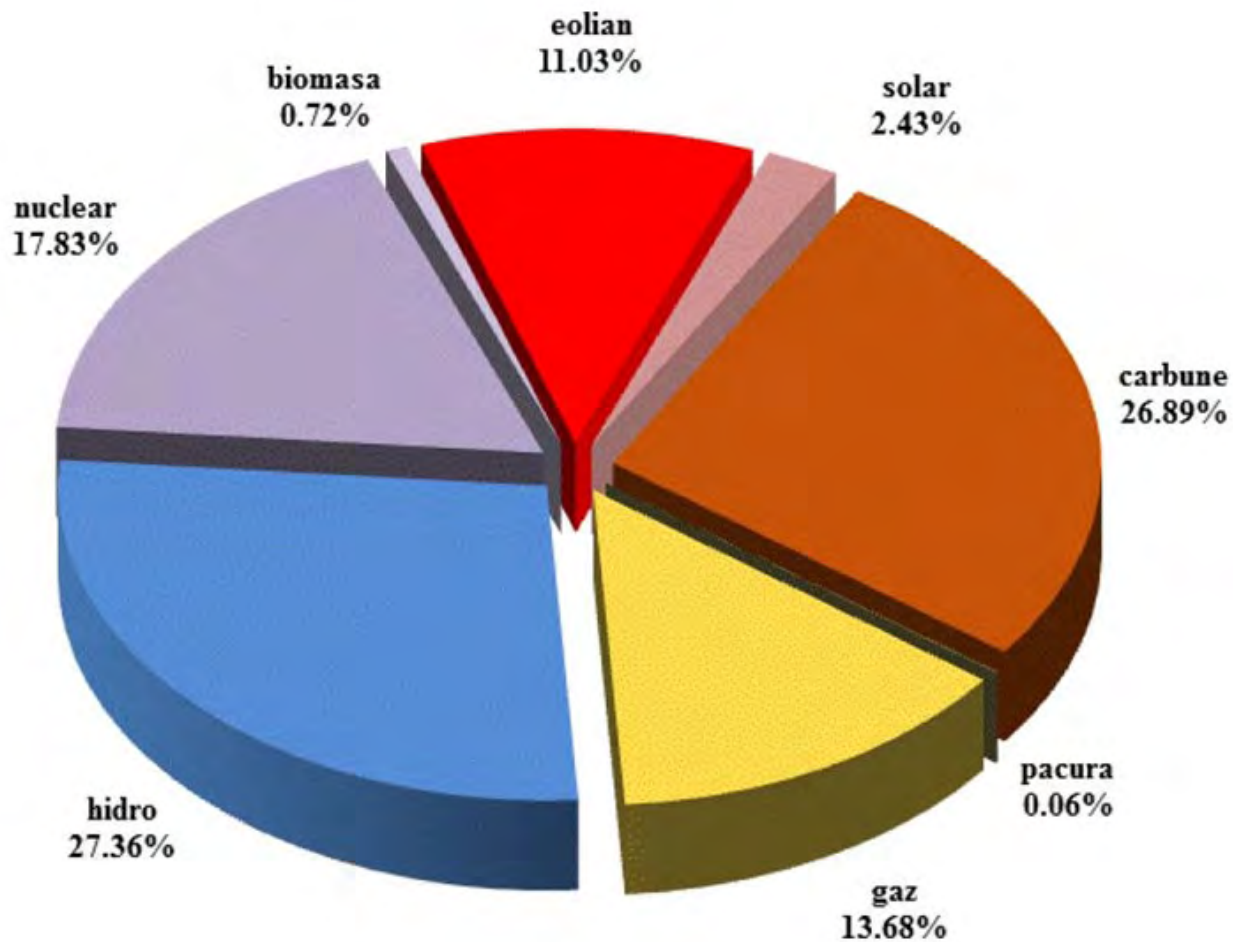
GeoEcoMar is also the founder member of CO₂ Club in Romania (2007) and the coordinator and main elaborator of the geological storage part of the feasibility study for GETICA CCS demonstration project.

Role of GeoEcoMar in promoting CCUS (II)

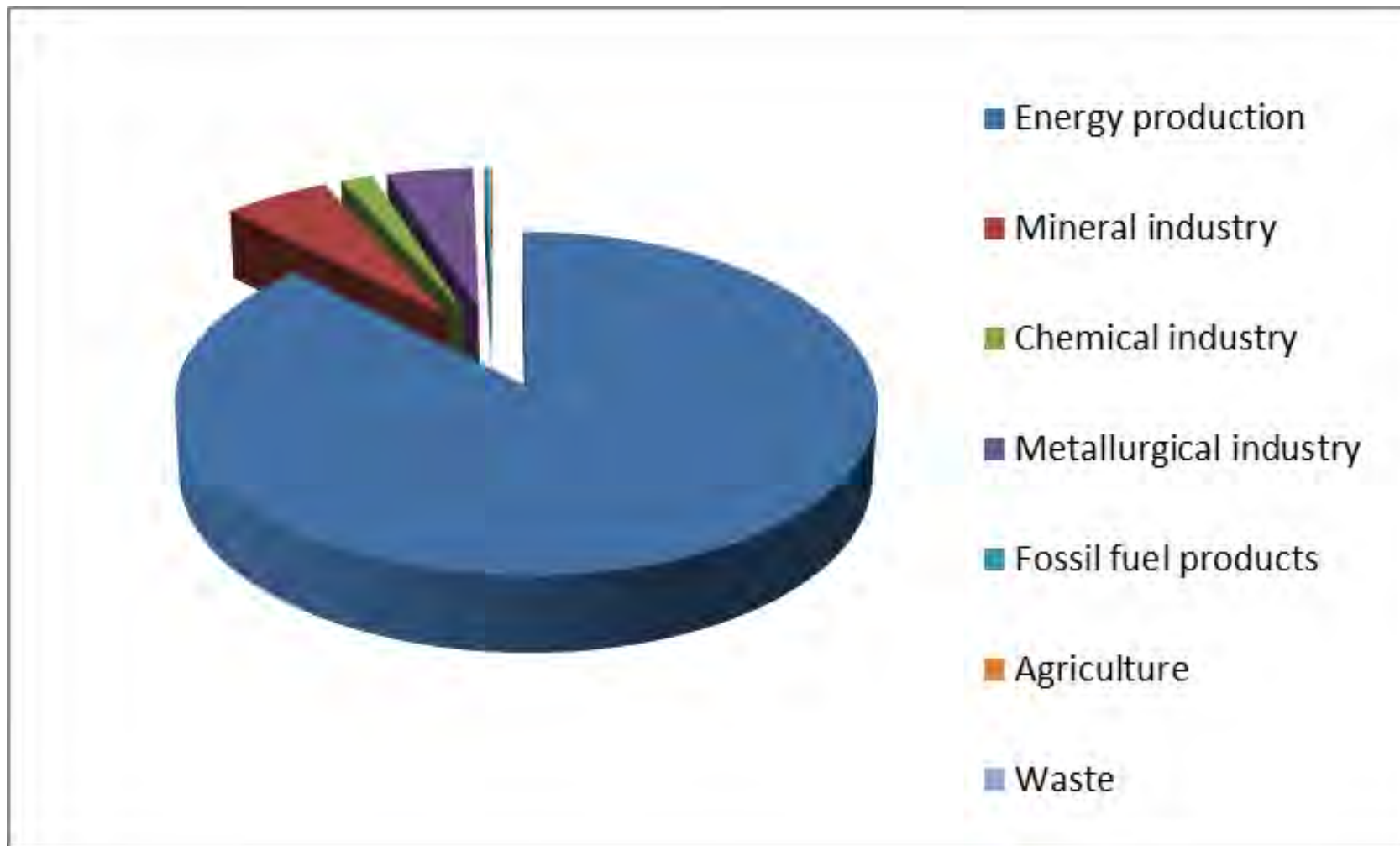
The institute also actively supported the transposition of CCS Directive into Romanian legislation, offering periodic consultation to National Agency for Mineral Resources, in charge of the legislative process.

After accession to the CO₂ GeoNet Association on 2013, GeoEcoMar is participating in the 'ENOS' HORIZON 2020 project for 2016-2020 period. Since 2017 GeoEcoMar is partner in two ACT projects: 'ALIGN CCUS' and 'ECO-BASE'.

CO₂ emissions and the geological storage possibilities in Romania



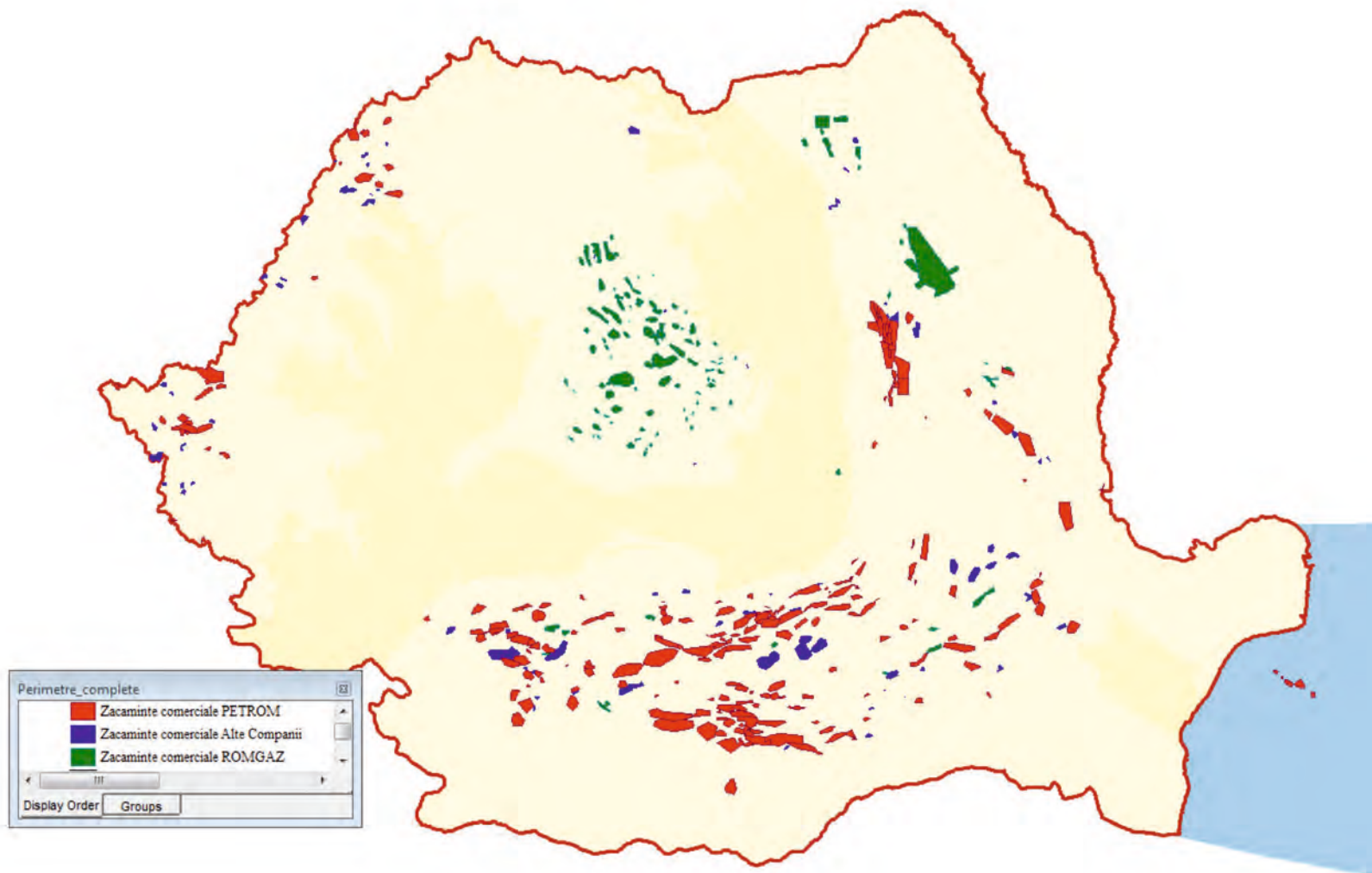
Energy mix of Romania



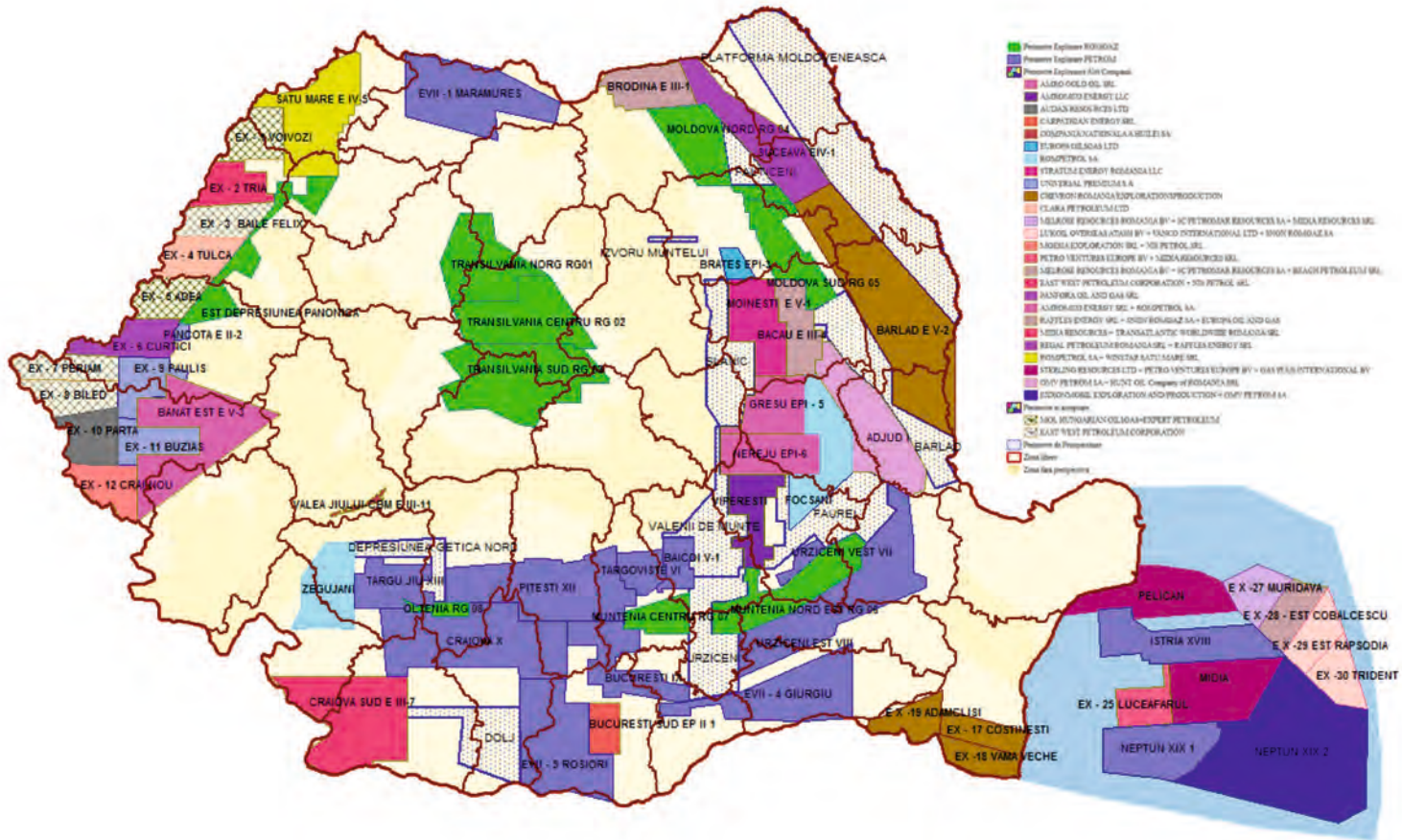
Industrial CO₂ emissions in Romania



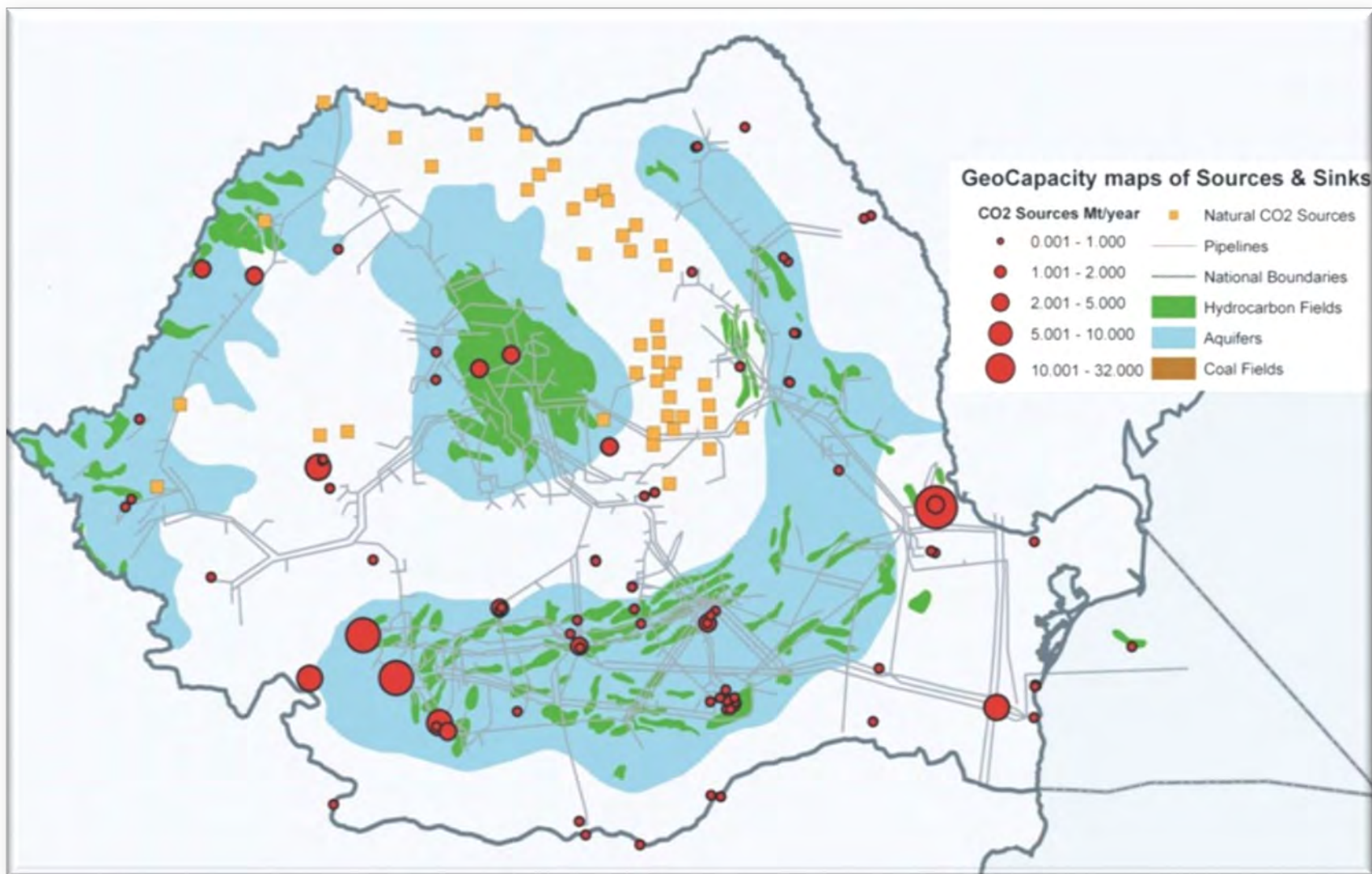
CO₂ Emissions by Romanian Regions of Development



Oil & Gas Deposits



Prospecting-Exploration-Extraction Hydrocarbons Blocks

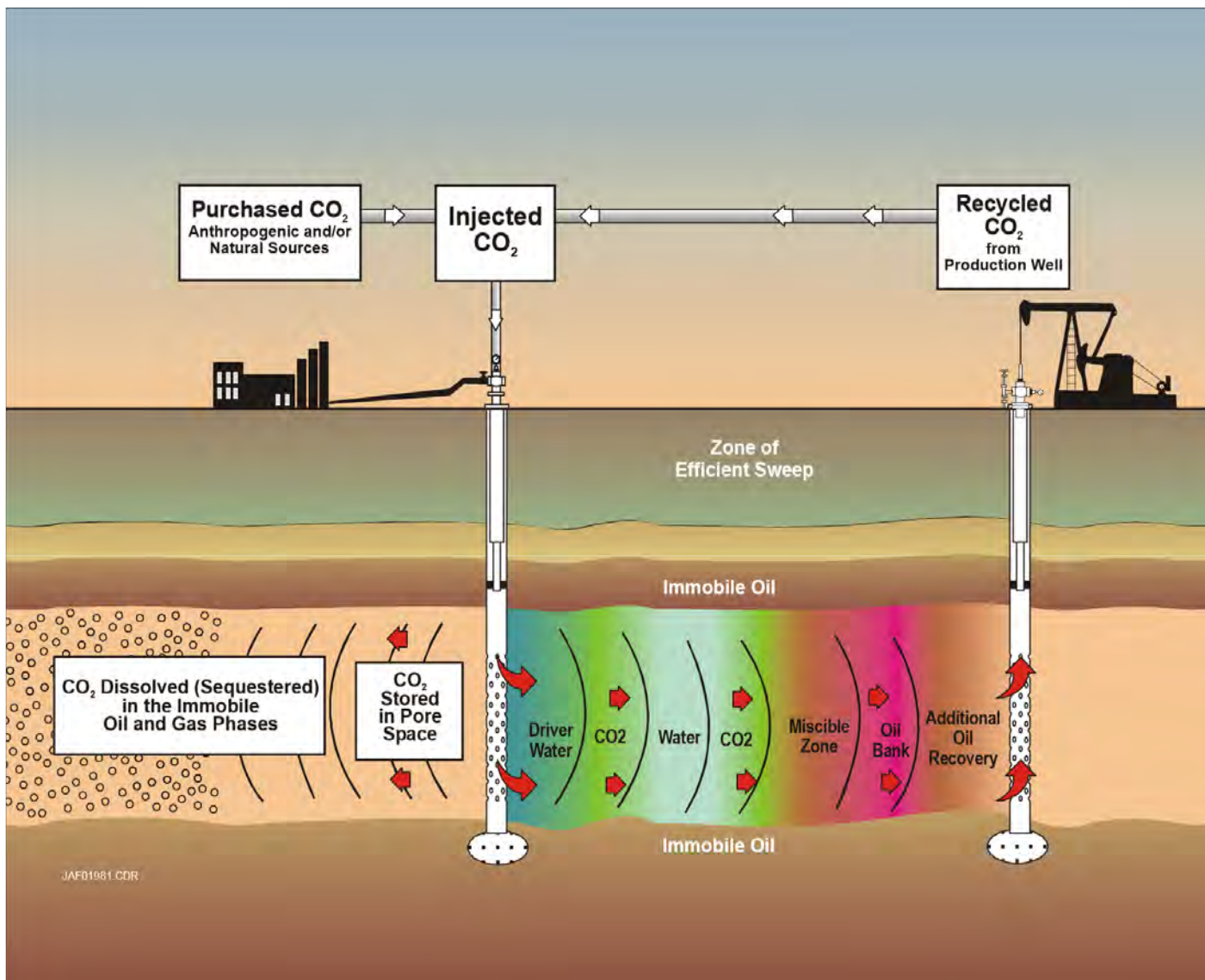


CO₂ geological storage possibilities

Utilization of CO₂ for EOR and EGR

CO₂-EOR operations have traditionally focused on optimizing oil production, not the storage of CO₂. However, CO₂-EOR can nonetheless result in very effective storage.

In general, nearly 100% of the initially acquired/purchased CO₂ for CO₂-EOR operations (not that which is recycled) will be stored at the end of active injection.



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CO₂ transport options in South of Romania

Multimodal transport of CO₂ consists in a smart usage of pipelines and ships. At the scale of Danube - Black Sea area and, why not, for a large part of Europe, promoting the multimodal transport of CO₂ could surpass the difficulties of building pipelines every where as well as, for exemple, those of public acceptance and transboundary cooperation, apart others.

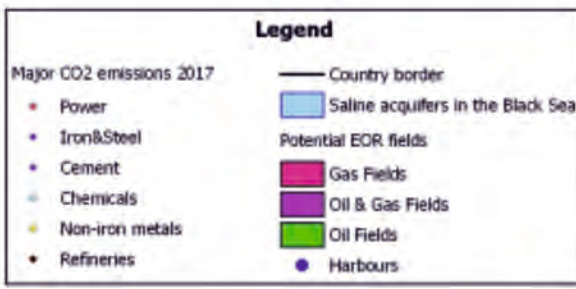
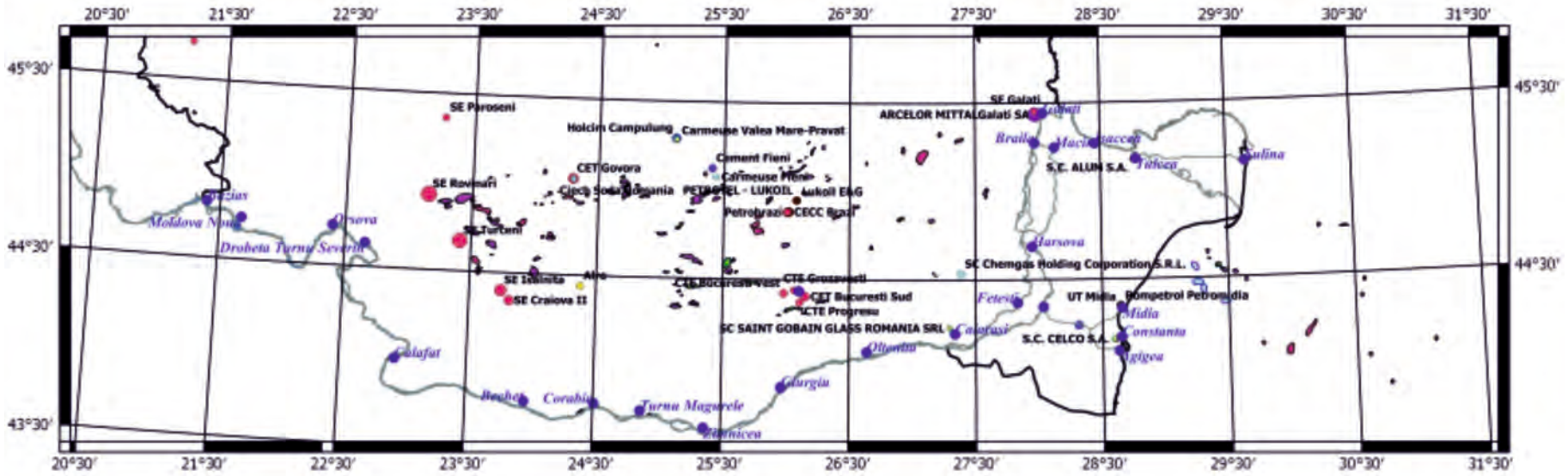
Instead of a unique network of pipelines, multimodal transport of CO₂ means a large usage of specialized ships on the inland waterways, and short pipelines between the emission sources as well as suitable storage locations with the closest harbours.

GeoEcoMar is the single Romanian organization having in the same time high professional experience in the complex geological and geophysical studies on the Danube and the Western Black Sea Basin as well as in the CCUS studies.

Related to the Southern part of Romania, from our previous and present CCUS studies, the industrial CO₂ emissions - verified on 2017, the appropriate geological structures for CO₂ storage as well as oil and gas deposits for EOR and EGR, are well documented.

Harbors on Danube and Black Sea shore

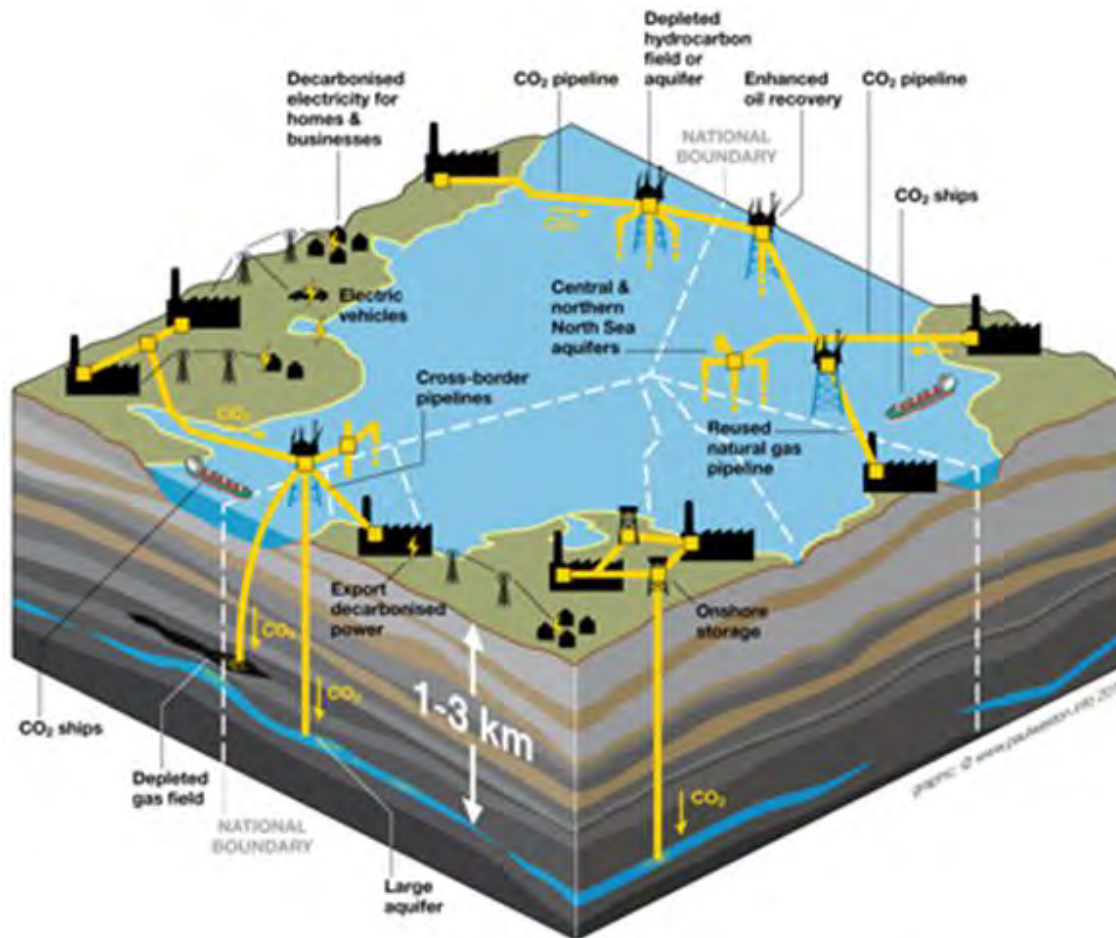




CO₂ Transport options in South of Romania

At the scale of the Southern part of Romania and, why not, for a large part of Europe, promoting the multimodal transport of CO₂ could surpass the difficulties of building pipelines everywhere as well as, for example, those of public acceptance and trans boundary cooperation, apart others.

Instead of a unique network of pipelines, multimodal transport of CO₂ means a large usage of specialized ships on the inland waterways, and short pipelines between the emission sources as well as suitable storage locations with the closest harbours, in our case, pairing industrial sources with the closest geological deposits, for transport through pipelines and pairing both the industrial sources and the geological deposits with the closest Danube harbours.



Western Black Sea have to follow North Sea! Why not?

Thank you for your attention!