ACT funded projects
ECOBASE and ALIGN-CCUS

Alexandra –Constanța Dudu[1], Constantin Ștefan Sava[1], Sorin Anghel[1], Andreea Burlacu[2], Mihai Chiran[3]

1-GeoEcoMar; 2- CO2 Club Romania; 3- Picoil Info Consult S.R.L.

Accelerating CCS Technologies

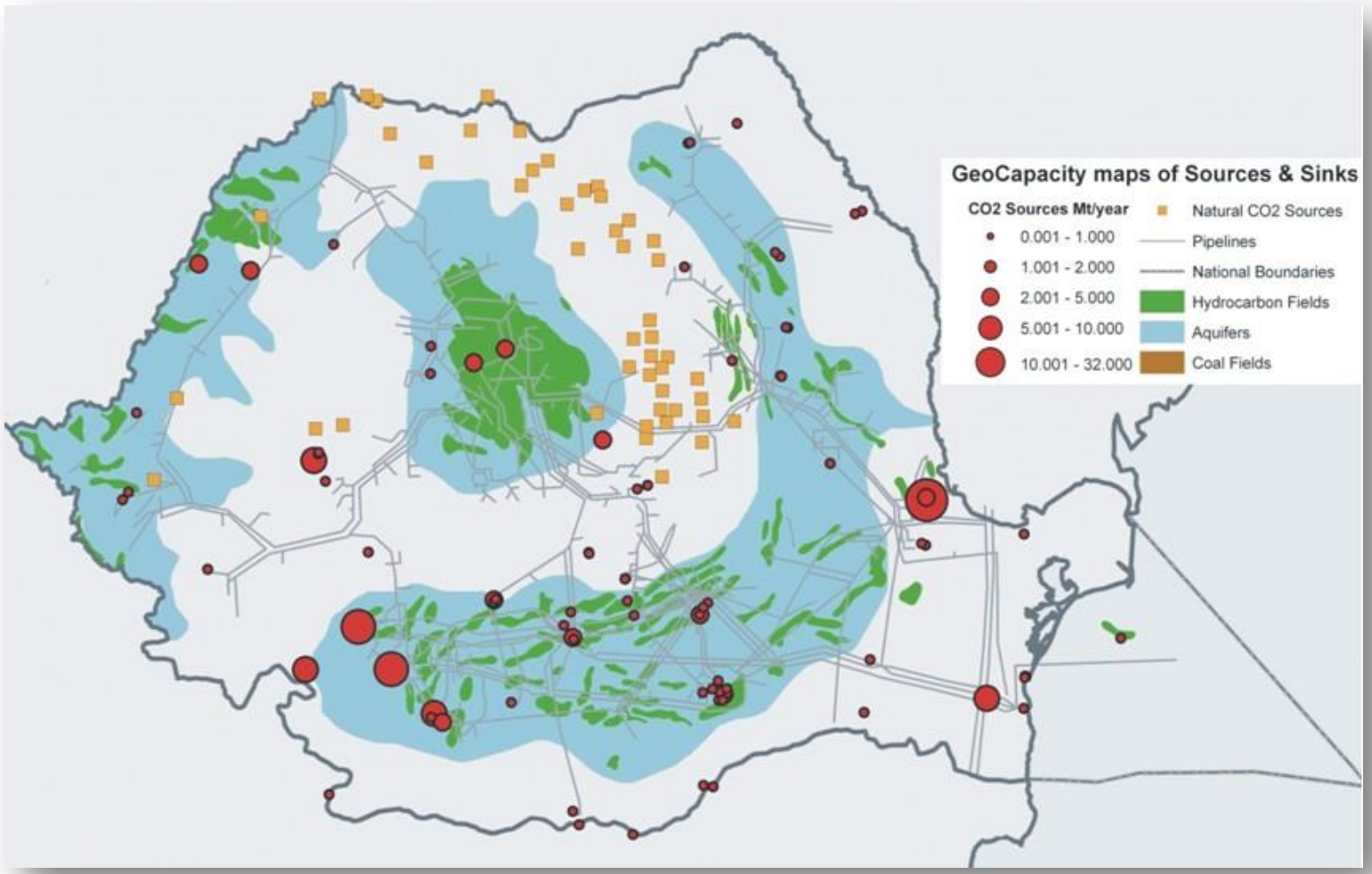
ALIGN CCUS

ECOBASE
Enhanced oil recovery with storage

EXPERIENCE OF GEOECOMAR IN CC(U)S RESEARCH

Implication in international projects and initiatives

- Research in CO_2 geological storage began in 2002 with the affiliation to ENeRG network
- GeoEcoMar was/is partner in FP6 (EUGeoCapacity, CO_2NetEast), Fenco ERA (Impact of communication), FP7 (CGS Europe), Horizon 2020 (ENOS), ACT (ALIGN-CCUS, ECOBASE)
- Contribution to the first European atlas for CO_2 geological storage based on the input in CO_2Stop
- 2013 – affiliation of GeoEcoMar to CO_2GeoNet

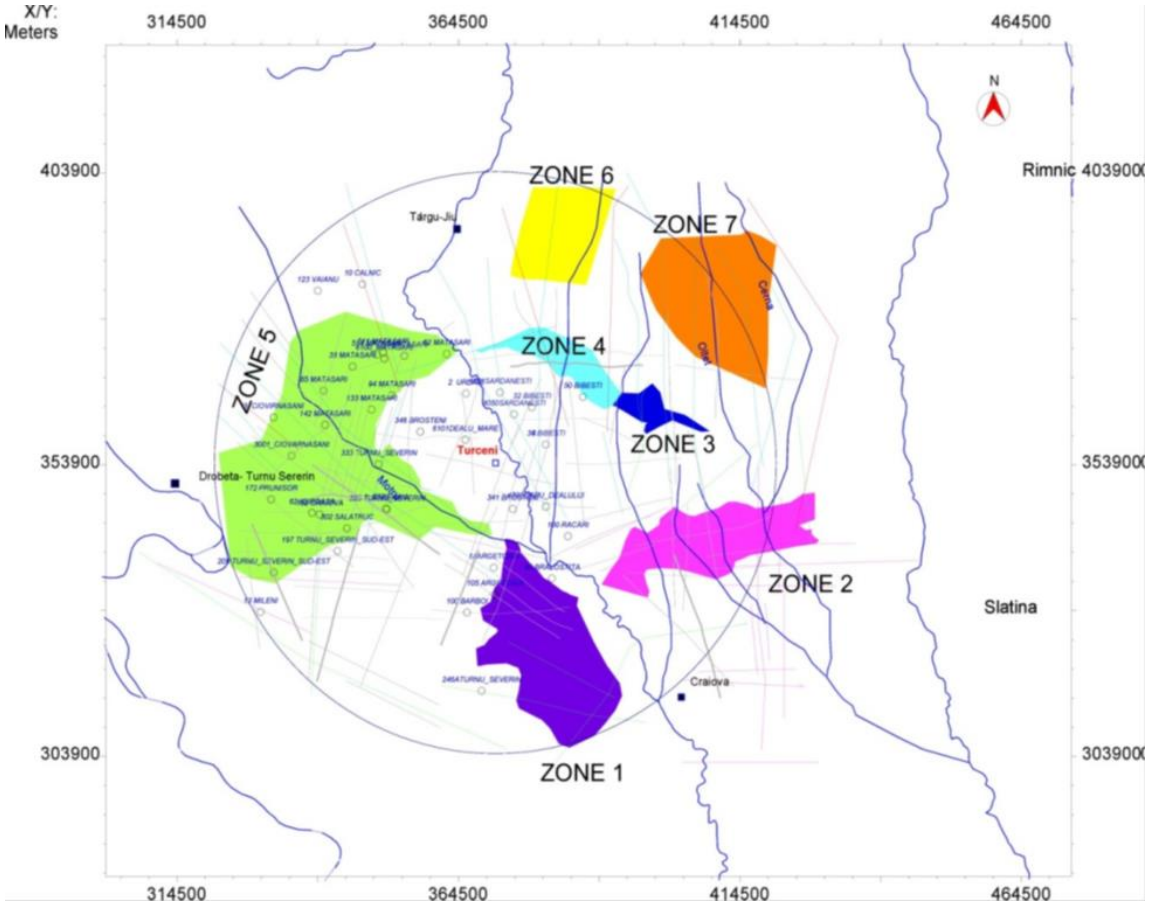


EUGeoCapacity, 2010

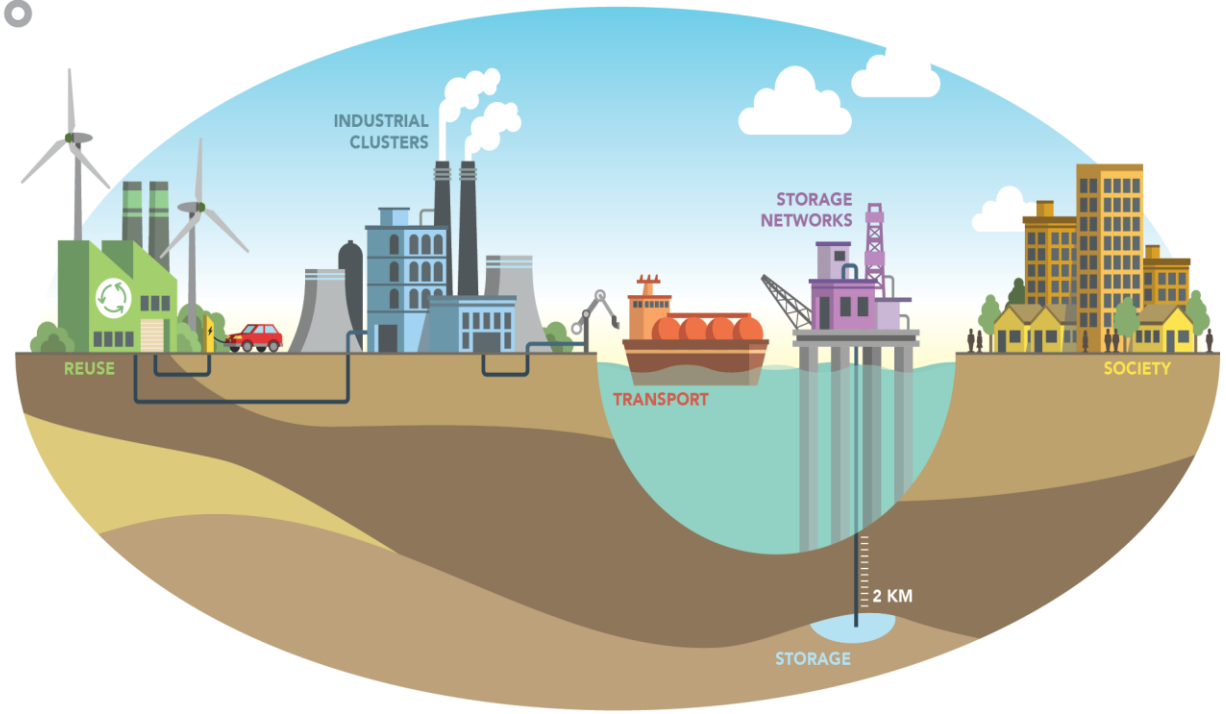
Implication in national projects

GeoEcoMar coordinated

- The National Program of Carbon Capture and Storage for 2011-2020 period
- "Geological storage" section of the Feasibility Study for the "Getica CCS" Demonstration Project.



GCCSI, 2013



ALIGN-CCUS - ACCELERATING LOW CARBON INDUSTRIAL GROWTH THROUGH CCUS

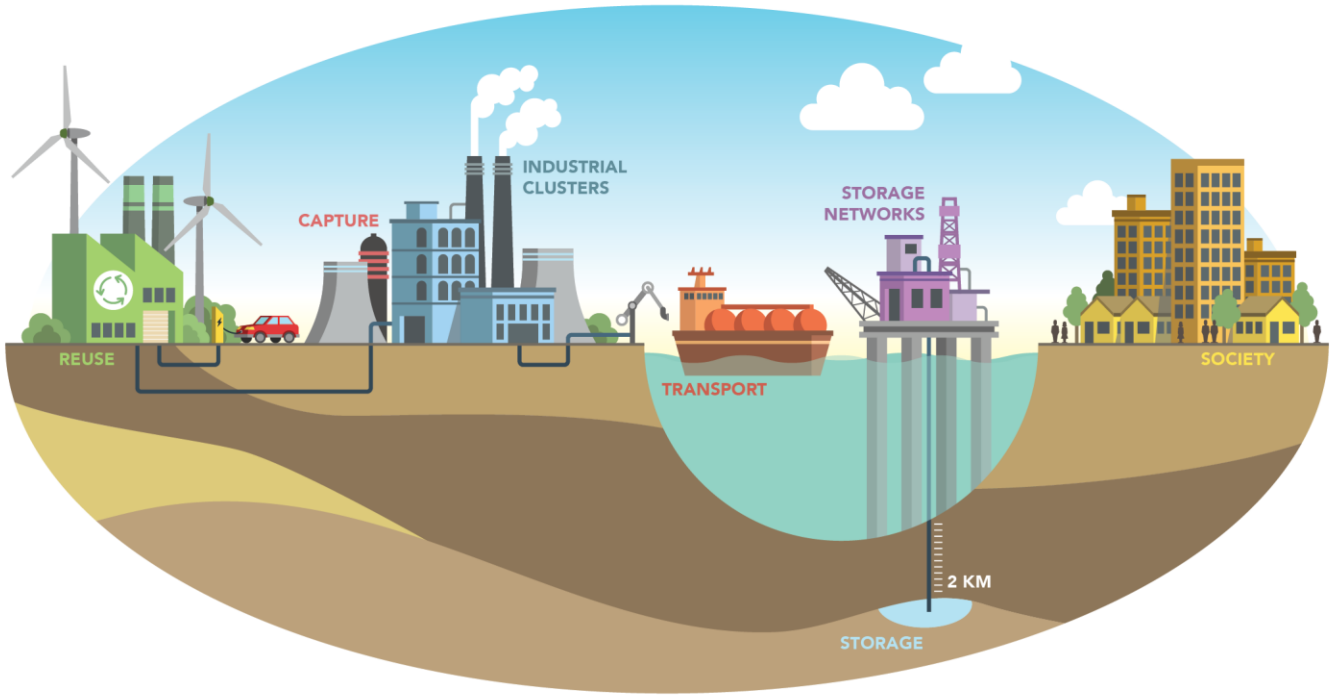
PETER VAN OS, TNO, PROJECT COORDINATOR

Key facts (1)

- Consortium
  - international partnership of 34 research institutes and industrial companies
  - Partners from 5 countries Netherlands, Germany, United Kingdom, Norway and Romania (NUSPA/SNSPA, GeoEcoMar, CO_2Club, Pic Oil Info Consult S.R.L.)
- Budget from ACT around 14 mill. EURO
- Main objective: enabling large scale, cost effective implementation of CCUS by 2025
- https://www.alignccus.eu/

Key facts (2)

- Specific objectives
  - Capture: Enable near-term deployment of CO_2 capture by improving performance and reducing costs
  - Transport: Optimising large-scale CO_2 transport
  - Storage: Reduce uncertainty in the provision of large-scale storage networks
  - Utilisation: Establish the contribution of CCUS as an element for large-scale energy storage and conversion
  - Social acceptance: Implementing CCUS in society



WP1 CAPTURE

- Emission control
- Solvent management
- Dynamics and control
- Cost reduction

WP2 TRANSPORT

- CO_2 shipping
- Batch-wise injection
- CO_2 specifications
- Planning for flexible networks

WP3 STORAGE

- Standardizing storage readiness
- North sea storage appraisals
- Re-use of existing assets

WP4 RE-USE

- CCU demonstrator construction
- Engine adaption
- Operation and testing
- CCU integration and scale-up

WP5 INDUSTRIAL CLUSTERS

- Teesside and Grangemouth (UK)
- Rotterdam (NL)
- North Rhine-Westphalia (DE)
- Grenland (NO)
- Oltenia region (RO)
- Commercial models for CCUS clusters

WP6 SOCIETY

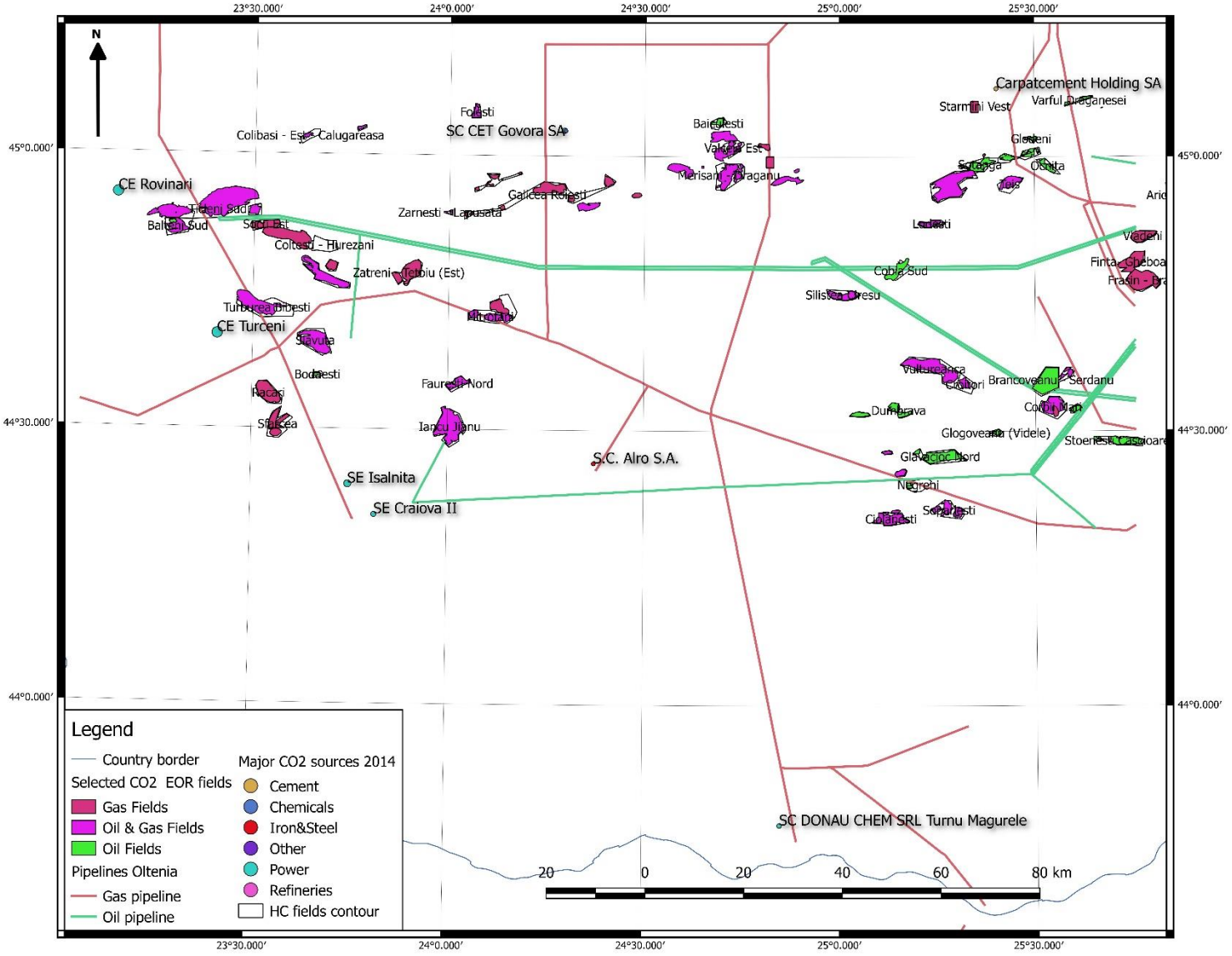
- Assessing public opinion
- Compensation strategies
- Improving EU dialogue on CCUS

WP0 MANAGEMENT

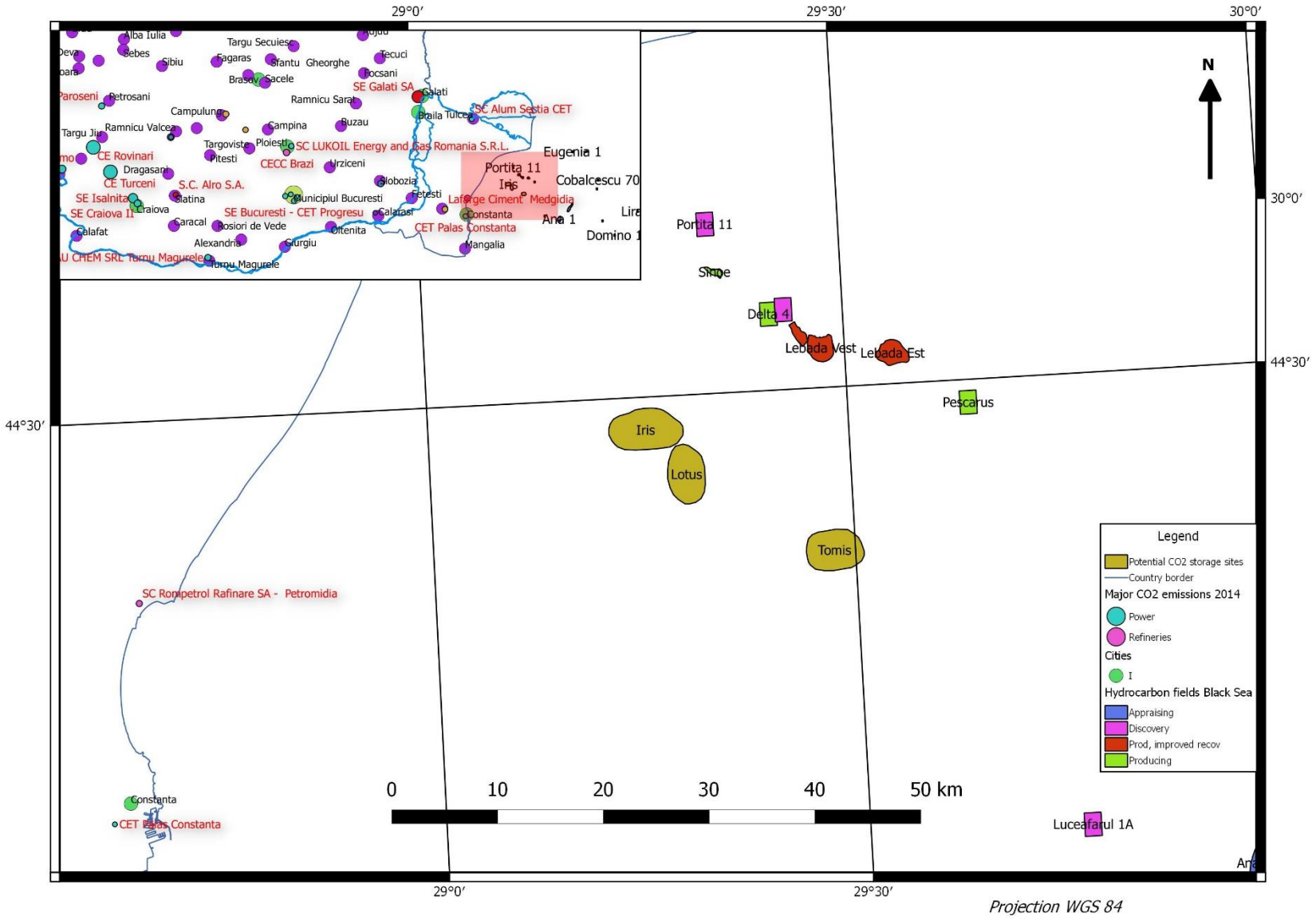
Blueprint for Oltenia region

- identification of the most feasible transportation routes for future captured CO_2 and investigate the storage and utilisation solutions available
- assessing CCUS pathways for the Oltenia Region
- identifying and describing the possibilities of using captured CO_2 from the Oltenia region industrial cluster for use in EOR offshore operations or industrial processes in the coastal area
  - Based on the proximity of Danube and open transport corridor to the Black Sea

Oltenia industrial cluster



Black Sea CCUS potential



ECOBASE

Enhanced oil recovery with storage

ECOBASE - ESTABLISHING CO_2 ENHANCED OIL RECOVERY BUSINESS ADVANTAGES IN SOUTH EASTERN EUROPE

ROMAN BERENBLYUM, PROJECT COORDINATOR, IRIS, NORWAY

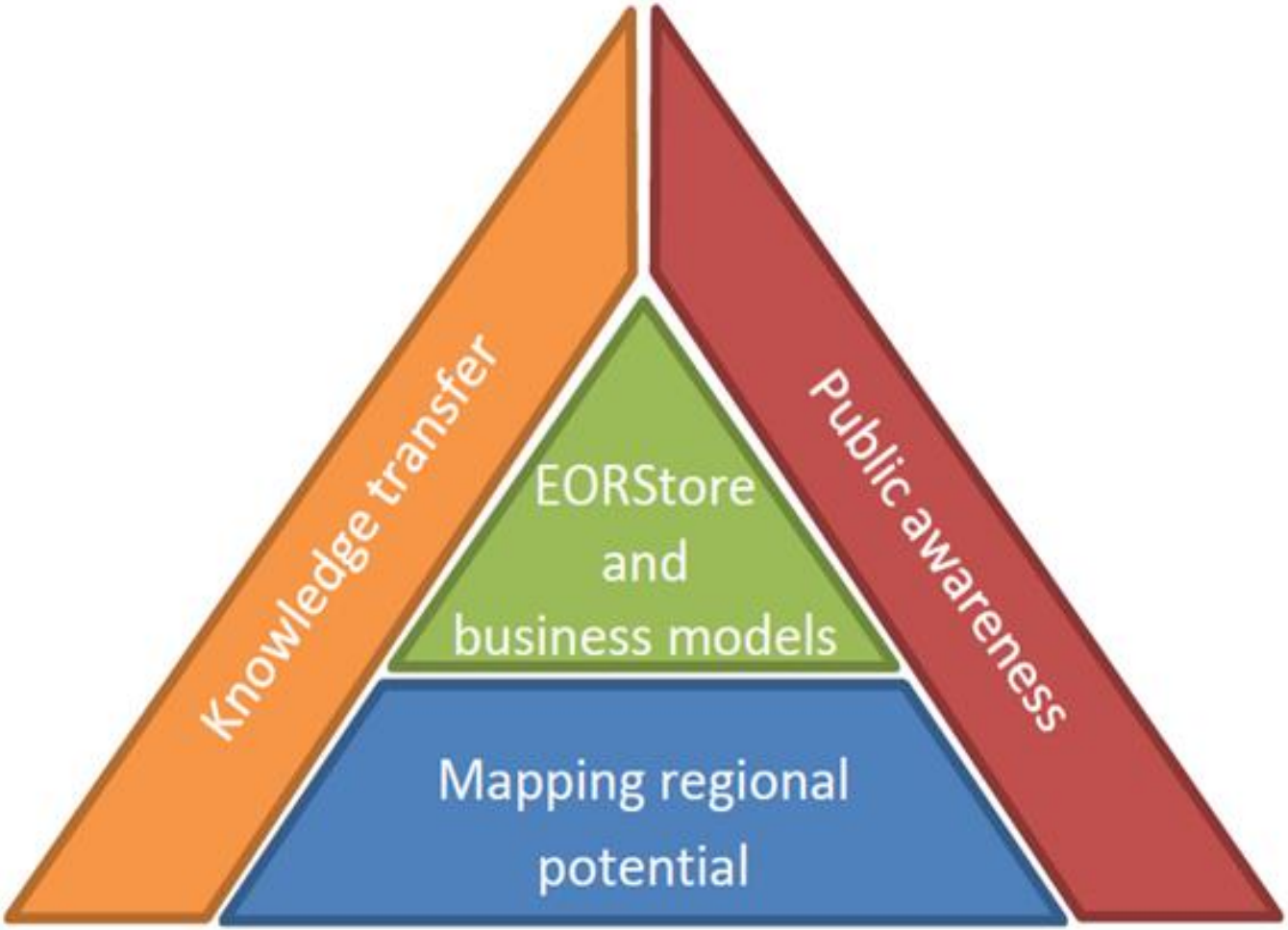

IRIS
TNO
PICOIL
INFO
CONSULT
CO2 club
ROMANIA
GeoEcoMar
PAL
ΕΘΝΙΚΟ
ΜΕΤΣΟΒΙΟ
ΠΟΛΥΤΕΧΝΕΙΟ

Key facts

- Budget from ACT around 1.2 mil EURO
- Main objective: develop revenue streams and business models for CO2-EOR in South-Eastern Europe (SEE) therefore supporting large scale CCUS deployment
- http://ecobase-project.eu/

- Basis: CO_2-EOR has the most significant commercial potential among utilization methods leading to permanent storage.
- Key technical milestones of ECOBASE are:
  - Inventory and mapping of sources and sinks in SEE and the establishment of regional source-sink clusters and CCUS roadmaps.
  - Optimized EORStore methodology for the most promising cases: from inventory to revenue streams. Preparation for piloting and generalized lessons learned.
  - Synthesis, guidelines and further plans.

ECO-BASE project structure

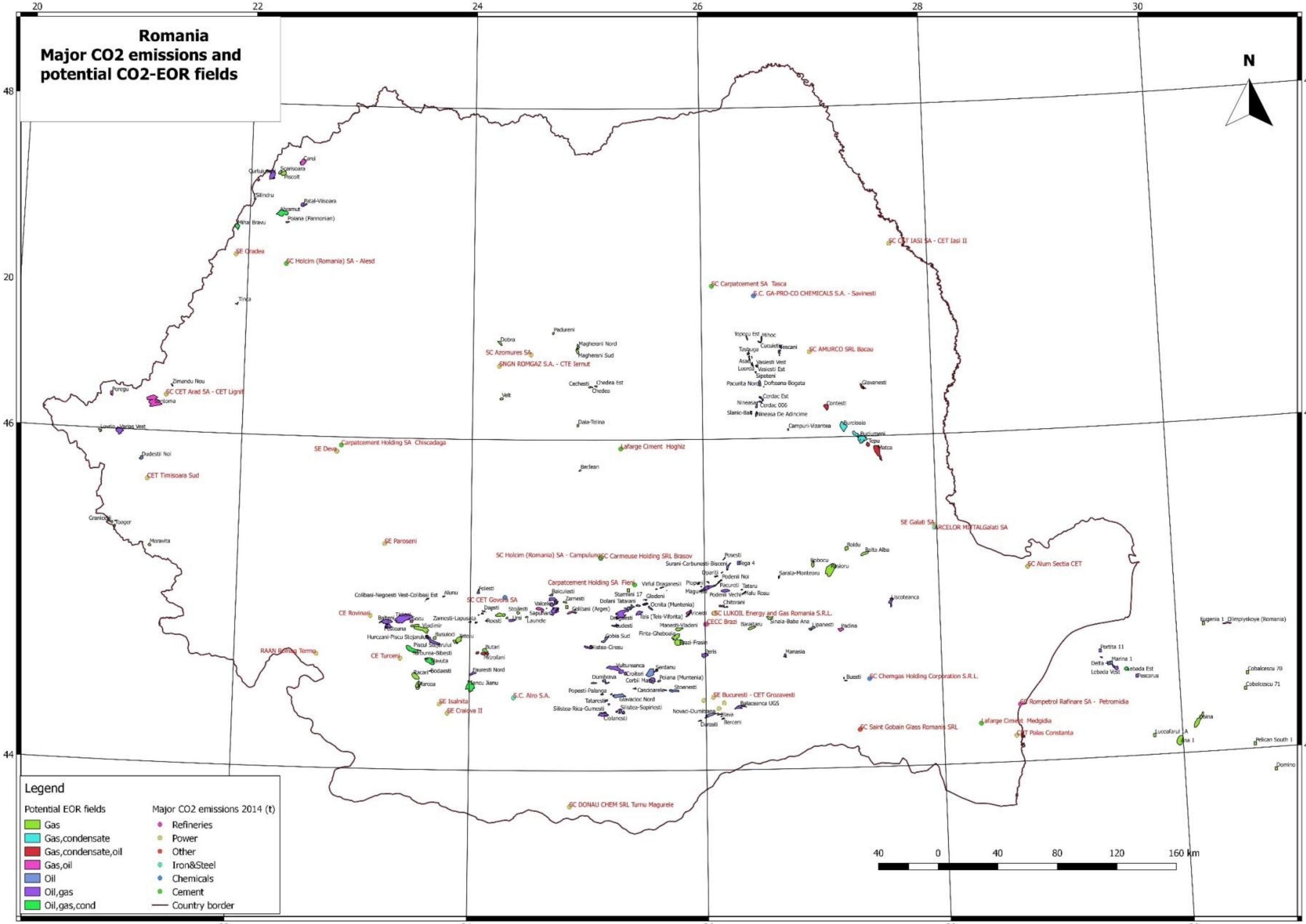


ECOBASE main activities

- 1. Mapping CCUS potential in SEE, establishing regional EORStore roadmaps, identification of most promising case studies for further analysis.
- 2. Creating a business case for selected EORStore case studies.
- 3. Knowledge sharing and transfer between North West Europe (NWE) and SEE and beyond to boost and support CCUS activities in participating countries.
- 4. Public awareness and acceptance.

Role of the Romanian consortium

- Collecting data on sources and potential CO_2-EOR sinks from Romania
- Preparing EORStore roadmap for Romania on the template provided by the coordinator
- Contributing to the analysis of selected CCUS chain(s)
- Contribution to the analysis of public acceptance issues for the case study
- Liaison with ENOS
- Contribution to dissemination activities



Romania
Major CO2 emissions and potential CO2-EOR fields
N
Legend
Potential EOR fields
Gas
Gas,condensate
Gas,condensate,oil
Gas,oil
Oil
Oil,gas
Oil,gas,cond
Major CO2 emissions 2014 (t)
Refineries
Power
Other
Iron&Steel
Chemicals
Cement
Country border
40 0 40 80 120 160 km
SC CET IASI SA - CET Iasi II
SE Oradea
SC Holcim (Romania) SA - Alesd
SC Carpatcement SA Tasca
S.C. GA-PRO-CO CHEMICALS S.A. - Savinesti
SC AMURCO SRL Bacau
SC Azomures SA
SNGN ROMGAZ S.A. - CTE Iernut
SC CET Arad SA - CET Lignit
SE Deva
Carpatcement Holding SA Chiscadaga
Lafarge Ciment Hoghiz
CET Timisoara Sud
SE Galati SA
ARCELOR MITTALGalati SA
SE Paroseni
SC Holcim (Romania) SA - Campulung
SC Carmeuse Holding SRL Brasov
SC Alum Sectia CET
Carpatcement Holding SA Fieni
SC CET Govora SA
CE Rovinari
SC LUKOIL Energy and Gas Romania S.R.L.
CECC Brazi
RAAN Romag Termo
CE Turceni
SC Chemgas Holding Corporation S.R.L.
S.C. Alro S.A.
SE Isalnita
SE Craiova II
SE Bucuresti - CET Grozavesti
SC Rompetrol Rafinare SA - Petromidia
Lafarge Ciment Medgidia
SC Saint Gobain Glass Romania SRL
CET Palas Constanta
SC DONAU CHEM SRL Turnu Magurele

Thank you for your attention !

Dr. Alexandra-Constanța Dudu
Head of CO_2 Geological Storage Department
GeoEcoMar
alexandra.dudu@geoecomar.ro