CALLISTO - MEDITERRANEAN CO₂ NETWORK

Candidate 1st PCI and PMI Union List TEN-E Reg. (EU) 2022/869

TEN-E Thematic Area: Cross-border CO₂ Networks
Member States: France, Italy

<table>
<thead>
<tr>
<th>Promoters</th>
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<tbody>
<tr>
<td><strong>Coordinating applicant:</strong> Air Liquide France Industrie</td>
</tr>
<tr>
<td><strong>Storage developers:</strong> Eni S.p.A, Snam S.p.A</td>
</tr>
</tbody>
</table>

- Enipower S.p.A.
- Yara Italia S.p.A.
- Cabot Italiana SPA
- Versalis S.p.A.
- Marcegaglia Ravenna S.p.A.
- Herambiente S.p.A.
- Polynt S.p.A.
- ArcelorMittal Méditerranée
- Basell Polyoléfines France SAS
- Elengy S.A.
- GRT Gaz S.A.
- Lafarge Ciments S.A.
- Les Chaux de la Tour (LHOIST Group)
- Lyondell Chimie France
- Petrolneos Manufacturing France SAS
- Société du Pipeline Sud Européen (SPSE)

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**Expected date of commissioning:** 2026-2027 (Italy) and 2029 (France)

**Implementation status**

- Italy: Ravenna CCS Phase 1 (25ktpa) sanctioned with S-U 2024; engineering study ongoing for the industrial phase (Ravenna CCS Phase 2) with S-U 2026
- France: Transport facilities feasibility studies launched in 2023

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**Details of Italian clusters & facilities**
**CALLISTO - Description**

Project aiming to **collect, transport and permanently store** anthropogenic CO₂ in the Mediterranean Sea

### Main infrastructure components:

<table>
<thead>
<tr>
<th>CO₂ Hubs</th>
<th>Location</th>
<th>CO₂ Pipelines</th>
<th>Terminals</th>
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</thead>
<tbody>
<tr>
<td>Fos - Marseille export Hub</td>
<td>Fos - Marseille</td>
<td>Pipelines network in Fos - Marseille and Rhône Valley clusters</td>
<td>In Fos - Marseille area: liquefaction units, buffer storages, ship loading facilities</td>
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<tr>
<td></td>
<td><strong>France</strong></td>
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<tr>
<td>Ravenna import Hub</td>
<td>Ravenna</td>
<td>Pipelines network from Porto Marghera, Ferrara and Ravenna clusters</td>
<td>In Ravenna area: vaporization units, buffer storages, ship unloading facilities</td>
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<td><strong>Italy</strong></td>
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**Storage Project**

<table>
<thead>
<tr>
<th>Ravenna CCS Project</th>
<th>Ravenna</th>
<th>One offshore pipeline from Casalborsetti (Ravenna) to storage site</th>
<th>CO₂ compression station, offshore CO₂ injection wells</th>
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<tbody>
<tr>
<td></td>
<td><strong>Italy</strong></td>
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- **128 Mt CO₂** avoided over **23 years** of operation
  - Ramp up from 2 to 6.4 Mtpa within the first 6 years of operation
- CO₂ from **France and Italy**, possibility to extend to other industrial basins in France and Italy, and other countries
CALLISTO - Support to the Cross-Border CO2 Networks Thematic Area

Development of CCS infrastructure:

CALLISTO Mediterranean CO₂ Network aims at implementing open access multi-modal CO₂ Hubs in the Mediterranean, supported by dedicated onshore transport infrastructures, with the purpose of enabling decarbonization of various industrial emitter clusters through CO₂ capture, aggregation, transportation and permanent storage of CO₂.

Location of emission clusters and industries for CO₂ capture:

<table>
<thead>
<tr>
<th>Location of emission clusters</th>
<th>Industrial installations where CO₂ will be captured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy - Ravenna</td>
<td>Chemistry, Waste to Energy, Steel, Fertilizer</td>
</tr>
<tr>
<td>Italy - Ferrara</td>
<td>Waste to Energy, Fertilizer</td>
</tr>
<tr>
<td>Italy - Porto Marghera</td>
<td>Bio-Refinery</td>
</tr>
<tr>
<td>France - Fos - Marseille</td>
<td>Lime, Steel, Chemistry, Refinery</td>
</tr>
<tr>
<td>France - Rhône Valley</td>
<td>Cement, Chemistry</td>
</tr>
</tbody>
</table>

Usage: No use of CO₂ is foreseen in CALLISTO PCI
### CALLISTO - Contribution to Specific Criteria

#### CO₂ emissions avoidance
- Capture of residual emissions from **hard to abate sectors** (cement, lime, steel, petrochemicals, waste to energy)
- Capture as **best solution** to achieve GHG emissions reduction at **lowest cost and closest time horizon** (H₂ from SMR, refineries, fertilizers)

#### Resilience and security of transport and storage
- Inland transport of CO₂ foreseen by underground pipelines in the main scenario: **better security and lower ecological impact** (vs train or trucks)
- Promoters are large companies **experts in CO₂ management**, with extensive knowledge of storage reservoirs, ensuring the project the **highest safety standards**
- **Shipping solution** permits **flexibility and resilience** over destination of CO₂
- **Large-scale storage** in South Mediterranean increasing resilience of CO₂ transport and storage at EU level

#### Efficient use of resources
- **Expansion potential:**
  - **CO₂ capture:** Interest of several industrial companies → **scaling up of the shared infrastructures**
  - **Shipping:** Flexible solution accommodating a **progressive ramp-up over time**
  - **Storage:** Phased development of **additional offshore storage sites located offshore Ravenna** in the Adriatic Sea
- **Mitigation of environmental burden and risks**
  - Where possible, **repurposing of existing facilities** (pipelines, offshore facilities, quays,...)
  - **Terminals built** in areas which are already within industrial sites
  - Highest **safety standards**, continuous monitoring of the reservoir