PYCASSO: the birth of a great crossborder industrial territories project

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PYCASSO: Pyrenean Carbon Abolition through Sustainable Sequestration Operations
PYCASSO: a crossborder CCUS project

An international consortium to favor climate neutrality through:

1- capture of the industrial CO2 emissions in SW France and North Spain (1 Mt/y in 2030)

2- creation of a CO2 transport network

3- development of CO2 re-utilization and geological storage hub in SW France

Taking advantage of the CO2 valorization capabilities and skills of the Lacq SEVESO cluster and huge storage capacities of the depleted gas fields of the Pyrenean foothills.
PYCASSO before PYCASSO: the conception

PYCASSO: a child of the COVID-19

Question by AVENIA: conjonctural or structural character of the strong activity decrease of its 200 members mainly focused on O&G domain?

Answer 1: long term structural problem because of the citizen disenchantment towards and finance disengagement from the fossil energies

Answer 2: retraining of our skills for a sustainable carbon neutrality: CO2 capture and underground storage; to give birth to a French new leash from the SW France emissions, historical regional root of AVENIA and location of a first successful demonstration: the Lacq-Rousse pilot
April 2020

The first emitters mapping:
Around 5 Mt/y of CO2
15 major emitters (more than 50 Kt/year) with 3 main SW France clusters:
- Comminges
- Bearn
- Landes

The first geological storages:
the depleted or abandoned gas fields probably well suited!
PYCASSO before PYCASSO : the pregnancy (2)

AVENIA first calculations about geological storages: **huge capacities**
more than 600 Mt more than 100 years of SW France emissions

Informal discussions with CAPPB show:

1) **strong local political support** for developing an integrated project
aiming at **decreasing CO2 emissions** and become a neutral territory in 2040!

2) But need to check the re-use of gas pipes networks to transport CO2,
and look for emitters able to enter a **CCUS** project under the AVENIA leadership,

3) And being given the storage capacities of SW France, more emitters could join: **the industrial regions of Northern Spain are key candidates for such**:
emitters mapping should be done.

**ACCESS to CO2 is KEY!**
May 2020: The LACQ project

First mapping in Euzkadi:

Main Emissions in Euzkadi: 7 MT/Y

Main storages are in France (very limited in Spain)

Interconnections (gas pipes) exist but available and when? for CO2 transportation

Lacq-Meillon is the barycenter of the emissions and can be the utilisation and storage HUB
PYCASSO : the delivery!

**November 2020**

New map with the integration of the Navarre emissions:
13 Mt/y as a whole!
CCUS project becoming more Spanish!
Need for contacting all emitters in Spain
How to name a French-Spanish crossborder CO2 abatement project?

=> **PYCASSO** for Pyrenean Carbon Abolition through Sustainable Sequestration Operations

First meeting with **CTP** (Communauté de Travail des Pyrénées) regrouping Euzkadi, Navarra, Aragon, Catalunia, Andorre, Occitanie and Nlle Aquitaine
How to progress: deep contacts with Spain

1-Thanks to CAPPB, we contacted REPSOL Madrid (E&P) : first meeting on February 2\textsuperscript{nd}, 2021, and REPSOL joined PYCASSO, April 2021: a winning pace for the project to become cross-border

2-Thanks to contacts with CTP, we got in touch with exceptionally involved correspondants able to appeal industrials:

EUZKADI: Ente Vasco de Energia (Bilbao)

NAVARRA: Associacion de la Industria de Navarra (Pampeluna)

ARAGON: Hydrogeno Aragon (Huesca)

First meeting with Spanish partners in Pau and visit of the Lacq cluster and the Rousse CCUS pilot; November 12\textsuperscript{th}, 2021! It worked! Spanish partners are interested!

3) Thanks to TEREGA partner, we contacted SNAM (Italy), November 2021 and ENAGAS (Spain) in December 2021 to deeply increase the European character and interconnections with the most important gas transport companies in the South of Europe!
PYCASSO: February 2021 - Synergies H2 and CO2 = a lot of new links between Spain and France

1- Electrolysis: lot of projects planned in Spain! And CO2 capture needs... O2!
\[ \text{H}_2\text{O} = \text{H}_2 + \frac{1}{2} \text{O}_2 \]

2- Methanation with green H2, from bio-ethanol or electrolysis
\[ \text{CO}_2 + 4\text{H}_2 = \text{CH}_4 + 2\text{H}_2\text{O} \]
and methanolization: \[ \text{CH}_4 + \text{H}_2\text{O} = \text{CH}_3\text{OH} + \text{H}_2 \]
They have already joined the coalition.