STRATEGY CCUS
A viable solution for a sustainable future

STrategic planning of Regions And Territories in Europe for low-carbon enerGy and industrY through CCUS

Coordination and Support Action (CSA)
Budget: 3 M€
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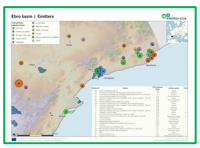
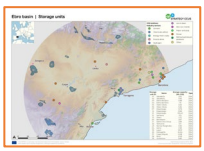
Ebro Basin (Spain)



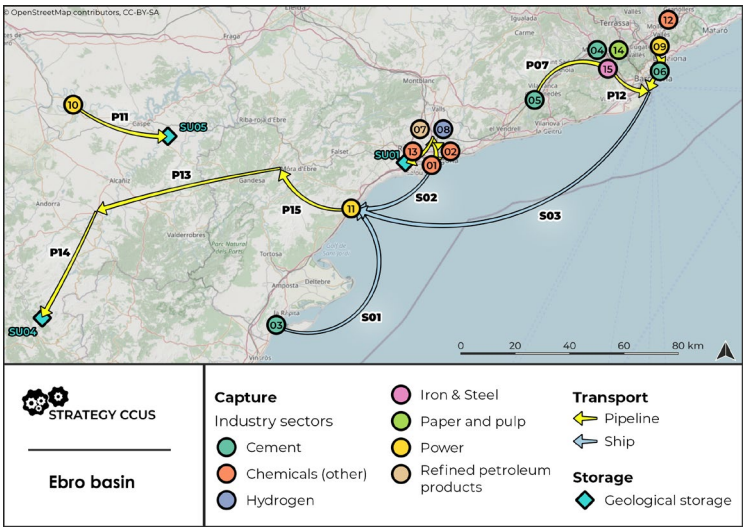
26 emitters: chemicals, cement industry and power generation producing 17.7 million tones of CO2 per year



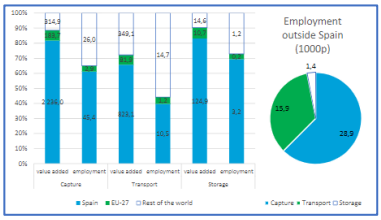
7 storage sites with **0.3 gigatones of CO2** estimated capacity (i.e. storaging total emitted CO2 during **17 years**)

3 ports in the area, train, roads, and good pipeline network.

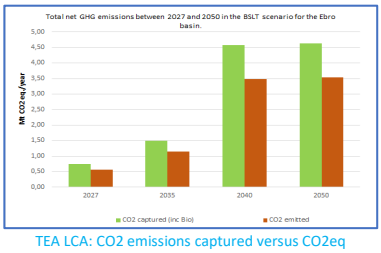
4th Regional stakeholder Committee: Labour Union, industry, national and regional administrations, universities, tecnological platforms.



Ebro Basin base scenario



MRIA: Impacts in Global Value changes



TEA LCA: CO2 emissions captured versus CO2eq emissions induced by CCUS operation between 2027 and 2050

Strategy CCUS Region KPIs (Discounted)

Analysis of the CCS system

Total CCS value chain	
CCS value chain (€/tCO2 avoided)	-97
Total CAPEX per block	**-28**
Cost of Capture (€/tonCO2 avoided)	-22
Cost of Transport (€/tonCO2 avoided)	-4
Cost of Storage (€/tonCO2 avoided)	-2
OPEX per block	**-69**
Cost of Capture (€/tonCO2 avoided)	-39
Cost of Transport (€/tonCO2 avoided)	-27
Cost of Storage (€/tonCO2 avoided)	-3
Transport cost (€/tonCO2 transported)	-31,3
Utilisation (income from CO2 sales) (M€)	77,5
EUA/ETS credit savings in the region (M€)	4456,8

Analysis of CO2 volumes (Mt)

Total CO2 Captured	69,4
CO2 utilized	3,9
CO2 for mineralization (perm. avoided)	1,1
Stored	65,5
Total emitted with CCS	153,1
Total avoided emission	66,3
BIO CO2 captured, neg. Emissions	1,0
Total CO2 fed into transport network	**66**
CCUS National Objectives	200
Share in national objectives	33,2 %

Analysis of ETS allowances

EU ETS parameters	
Price of allowances in 2025 (€/tonCO2)	70
Price of allowances in 2045 (€/tonCO2)	212
Whole regional expense without CCUS:	
ETS costs without CCUS (M€)	18.603,5
Whole region expense with CCUS	
ETS costs with CCUS, remaining emissions (M€)	14.146,7
Cost of CCUS (M€)	6.414,9
TOTAL costs with CCUS (M€)	**20.561,5**
Cost difference, with minus without CCUS (M€)	**1.958,0**
Average yearly energy need, TWh/year	**6,36**
Peak energy need, TWh/year	**13,60**
Breakeven CO2 price (€/tonCO2)	88

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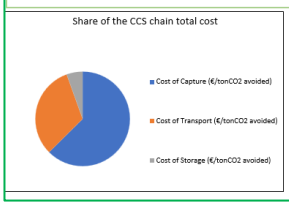
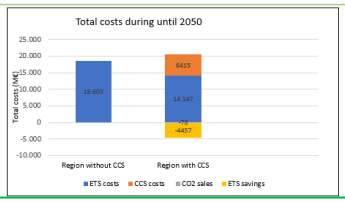
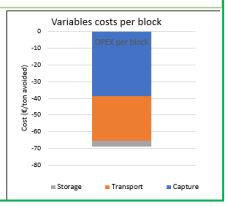
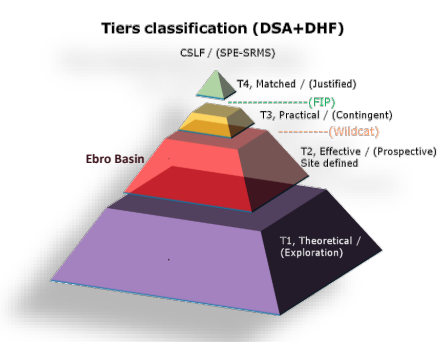
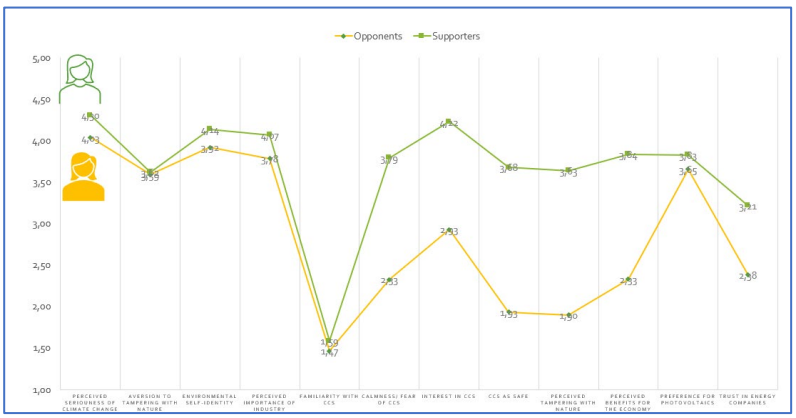






Economic evaluation results for Ebro Basin (Base scenario)





Social acceptance: attitudinal differences between supporters and opponents to CCS developments (mean value, scale from 1-not at all to 5-completely)

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