



REFORMA DEL COMERÇ D'EMISSIONS DE CO₂: VISIÓ DE LES EMPRESES AFECTADES

EIC Tarragona, 17 Oct 2023

TARRAGONA : LARGEST MEDITERRANEAN CHEMICAL CLUSTER



Consortium
Reclaimed Wastewater
6 hm³/year

Strategic Cluster



1st Hub South EU
\$20bn Asset base



25% Spanish Chemical Sector
50% Catalan Chemical Sector



34 Global Companies



1 Refinery and 2 crackers (3 in SP)



Deep Sea Port >16m draught & access to global LPG carriers.



20MMTn Chemical Production



60% Plastic in Spain



35,000 induced jobs

Strategic Assets in Spain

Tarragona Integrated Complex
Refinery..... 200,000 bpd
2 Cracker Tarragona..... 1400kTnY C2
Derivatives facilities: PO, BD, PE, PP, PG, PS...



CO₂ Emissions

Spain 334MMTn CO₂
Chemical & Refinery..... 20 MMTn CO₂
Tarragona Cluster 5MMTn CO₂
Dow 1MMTn CO₂



Energy Transition Developments

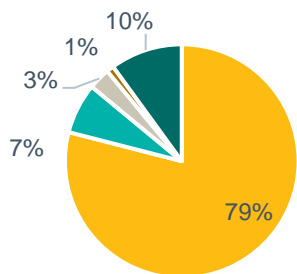
Renewable Power 3 GW 2030
H2 Valley Cluster 1 GW 2030
CO₂ to fuels 50 bpd
Gasification Waste MeOH . . . 250kTnY 2025
HVO Plants (Spain) Bio-naphtha

DOW TGN DECARBONIZATION ROADMAP

Our vision in 3 phases

Gradual Reduction of our CO2 – Scope 1 2 3

~1 MM Tn
Scope 1 (2021)



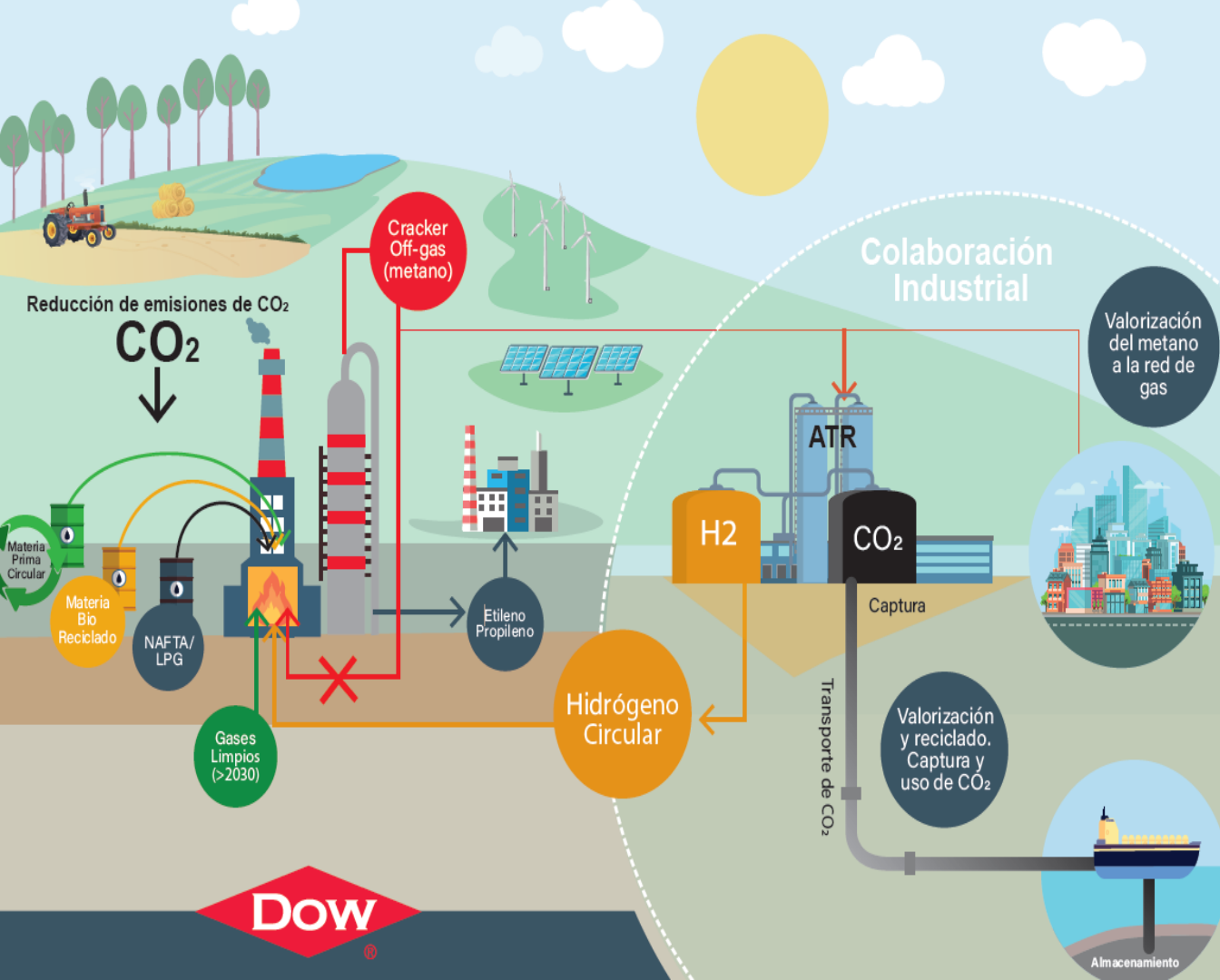
- Hornos
- Calderas
- Unidad de Cogeneración
- Antorcha
- Tarragona Sur-Derivados

OBJECTIVES

LEVERS

	Generation 1	Generation 2	Generation 3+
OBJECTIVES	20%* (vs 2020)	50-80%* (vs 2020)	≈ neutrality
LEVERS	(Mature Technologies) Energy Efficiency Electrification Feedstock Flexibility Renewable Energy	(Bridging Technologies) Circular H2 Firing Carbon Capture Storage	(Winning Technologies) E-Cracking Syngas to Olefins

*porcentajes estimados



Carbon neutrality

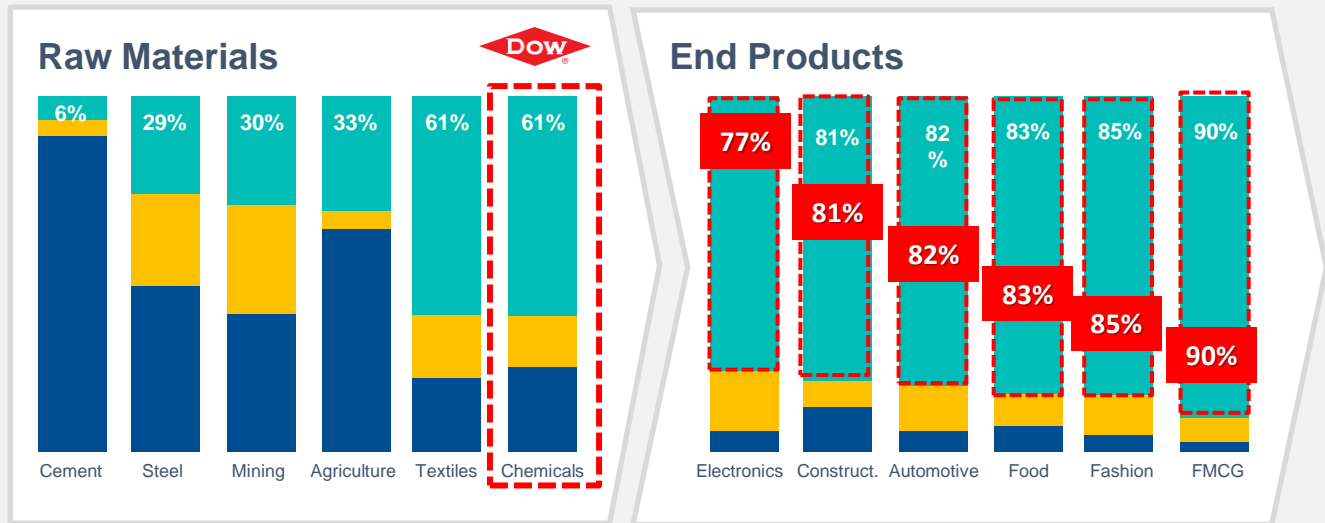


PATH TO ZERO JOURNEY: CHEMISTRY IS ESSENTIAL

Dow Carbon Neutral & Circular Materials Have an Impact to Cut Customers CO₂e Emissions (Scope 3)

Emission split in Scopes 1, 2 and 3 upstream for selected industries (CO₂e, 2019)

- Supply chain (Scope 3 upstream)
- Purchased power, etc. (Scope 2)
- Operations (Scope 1)

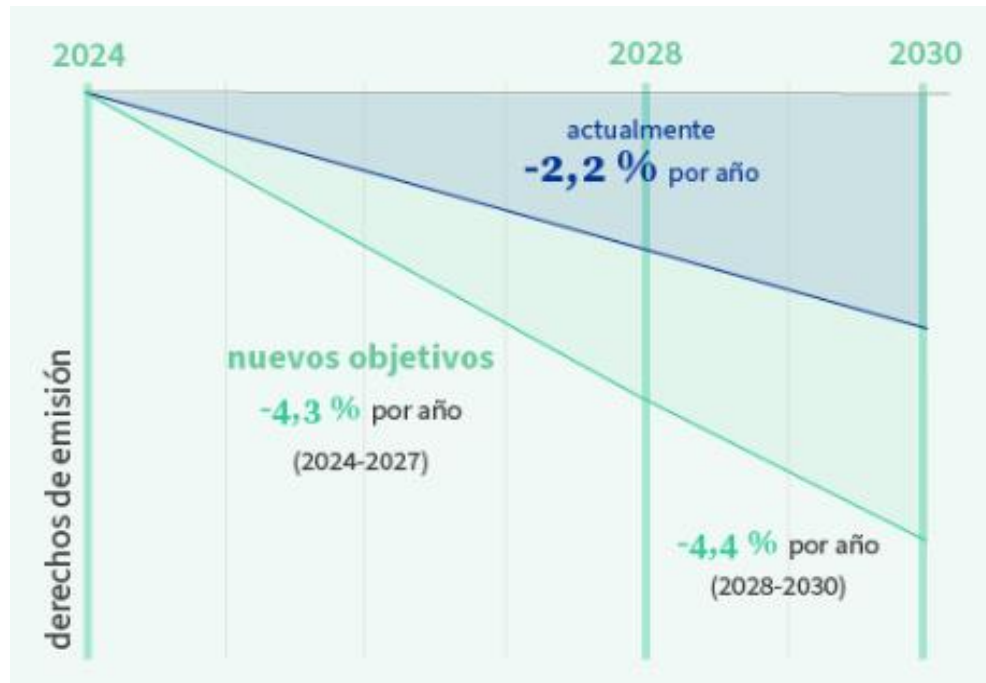
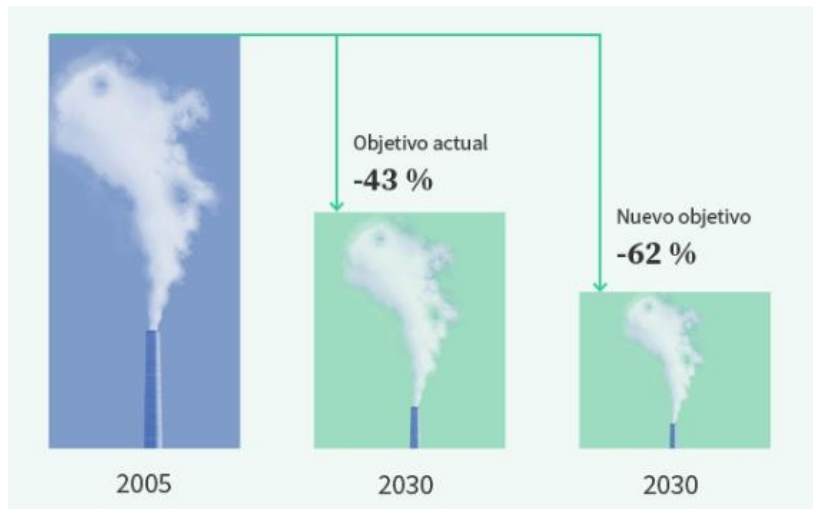


Note: Top companies selected based on number of reported Scope 3 upstream categories and industry fit; FMCG = fast-moving consumer goods

Source: CDP, BCG

REFORMA EU ETS

- [Directiva \(UE\) 2023/959 del Parlamento Europeo y del Consejo de 10 de mayo de 2023 que modifica la Directiva 2003/87/CE](#)



ETS overview – path to 0

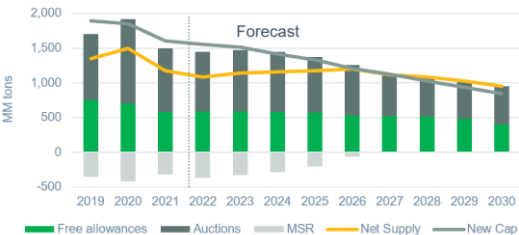


BINDING
on governments

Enforceable
EU action against national
governments
NGO litigation


EU ETS - Supply vs Cap

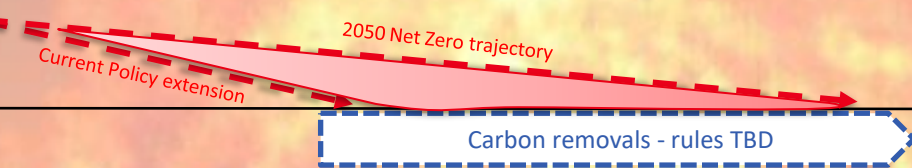
Forecast



-62%
(all installations
in the EU ETS, not a
target on
individual companies)

Post-2030 pathway to 0 allowances still to be determined
Most reasonable assumption: steadily declining cap


No allowances left in
the market?
➤ Penalty for emissions
without allowances =
€100/ton +
allowances

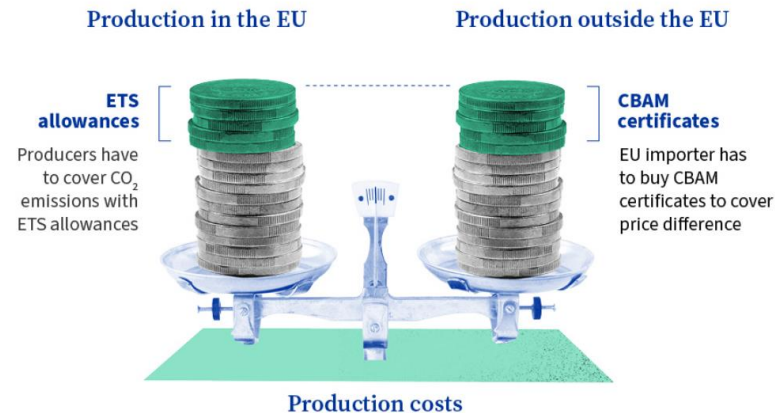


CBAM: HOW DOES IT WORK?

How carbon leakage occurs



How CBAM counters carbon leakage



Source: Consilium

CBAM aims to

- Become the new carbon leakage protection tool
- Encourage policy makers in third-countries to implement carbon pricing schemes
- Encourage producers in third-countries who export to the EU to adopt low-carbon technologies

Potential areas of controversy

- Possibly no EU ETS export credits
- Conformity to World Trade Organization (WTO) policy
- Risk of trade disputes

CBAM: CURRENT & FUTURE SCOPE

2023-2025

- Reporting only across following sectors (Phase 1):



iron and steel



cement



fertilisers



aluminium



hydrogen production



electricity

2026-2030

- Reporting and levy for Phase 1 sectors
- Chemicals and Polymers
- Downstream products from Phase 1
- Transport emissions (?)

2030+

- Reporting and levy
- All EU ETS sectors
- Transport emissions (?)

IRA (INFLATION REDUCTION ACT): KEY THEMES AND APPLICABILITY

Processes



Process Decarbonization

- Hydrogen
- Nuclear
- Clean/alternative fuels
- Carbon capture and sequestration



Combined Heat & Power

- Cogeneration
- Boilers, furnace and steam turbine upgrades



Waste Heat Recovery

- Waste energy
- Regenerators
- Steam driven compressors, pumps, fans

Products



E-Mobility

- Materials used in electric vehicle batteries, motors, inverters, and charging equipment including electrode active materials



Solar Energy

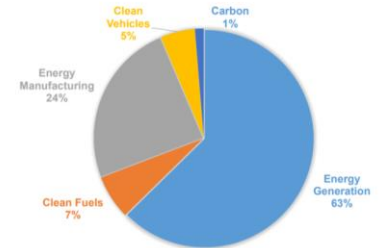
- Materials used in solar energy applications, including encapsulants, heat transfer fluids, and sealants



Energy Efficient Buildings

- Includes materials aimed at building efficiency, including sealants, insulation, and panels

Energy Tax Credits



Lot of new credits

Long runway on effective dates

Transition to technology neutral

Focus on U.S.A.

MAIN CONCLUSIONS

- Chemical industry makes **essential contributions to most strategic ecosystems, indispensable for the achievement of the Green Deal**
- **European chemical industry is losing competitiveness on global chemical markets** (energy/feedstock costs, weak market, regulatory)
- Committed to the Paris Climate Agreement/EU Green Deal → **Decarbonize and Grow strategy which will address emissions from Scope 1, 2 and 3**
- Investments cycles are long and amounts are also in very high range (both CAPEX and OPEX) of several hundred millions to billions.
- Europe has become significantly less attractive as a result of the **US Inflation Reduction Act**.
- In EU: **Net Zero Industry Act, NextGenerationEU, ETS Innovation Fund** → oversubscribed, funding landscape insufficient and not so easily accessible.
- Investments in new production capacity can easily flow to other parts of the world if the business case for investing in Europe is difficult to make.
- In conclusion, without measures addressing the loss of competitiveness relative to other countries arising from high policy ambition, coupled with increased energy and carbon costs, damped consumption, and heavy transition investment needs, the EU chemical as well as other EU industrial sectors can suffer from accelerating leakage, with serious consequences for the industrial transformation.