



Impact of CO2 on electricity market

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- *De-carbonization ... through market means*
- *Fuel switch*
- *Impact of the CO2 price in the WB6*
 - Price
 - Technology choice
- *Conclusions*

Gas wins recognition as 'transitional technology' to climate neutrality

By Dave Keating | EURACTIV.com

7:15 (updated: 8:50)



European Commission President Ursula von der Leyen (L) and German Chancellor Angela Merkel (R) arrive at a press conference following a face-to-face EU summit, in Brussels, Belgium, 11 December 2020. [EPA-EFE/JOHANNA GERON]

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The lower carbon intensity of natural gas - which produces half the emissions of coal when burned in power plants - and the emergence of new technologies like hydrogen are setting gas apart from other fossil fuels in the clean energy transition.

On Friday, the European Council, which brings together the EU's 27 national leaders, adopted a new greenhouse gas reduction target for 2030: -55% from 1990 levels, up from the previous target of -40%.

In their conclusions, the leaders reaffirmed that it will be up to each member state "to decide on their energy mix and to choose the most appropriate technologies to achieve collectively the 2030 climate target, including transitional technologies such as gas."

Gas advocates: transition fuel

- gas produces on average half the emissions of coal when burned into power plants
- infrastructure could now be used in the future for hydrogen gas



Climate activists:

- Focus should be in clean technologies

<https://www.euractiv.com/section/energy/news/gas-wins-recognition-as-transitional-technology-to-climate-neutrality/>

What does the market say!?

EUA Price



Today: 1t of CO₂ = 30 EUR

With increase in CO₂ price, there is a linear increase in the marginal costs of fossil fuel PP



Marginal costs of fuels that emit more CO₂ per MWh of electricity grow faster


=> fuel switch



Continued increase
=> switch to clean

At what price?

Source: <https://ember-climate.org/data/carbon-price-viewer/>

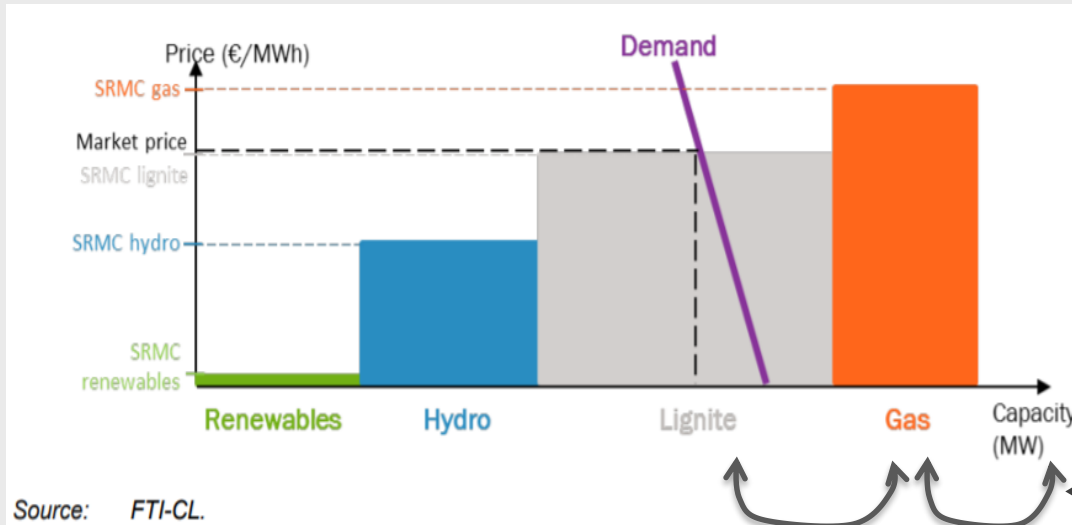
- In addition to paying for externalities, the purpose of CO2 market is to signal the switch in the merit-order
- At what level of CO2 price the merit order is affected depends from many factors
 - Level of demand, RES inflow, fuel costs, flexibility/storage, technological mix, etc.
 - In 2019 ECS procured a study to assess impact of the CO2 price in the adequacy – modelling performed by 
ENERGY
 - *How the adequacy will be affected once the EU ETS applies in WB6*
 - *How the electricity prices will be affected, and*
 - *At what price of CO2 coal PP will start being kicked of the merit order*

https://www.energy-community.org/dam/jcr:87374c80-64a2-4f18-81ed-f202d4d1ed56/Compass_DLA_EL_122019.pdf

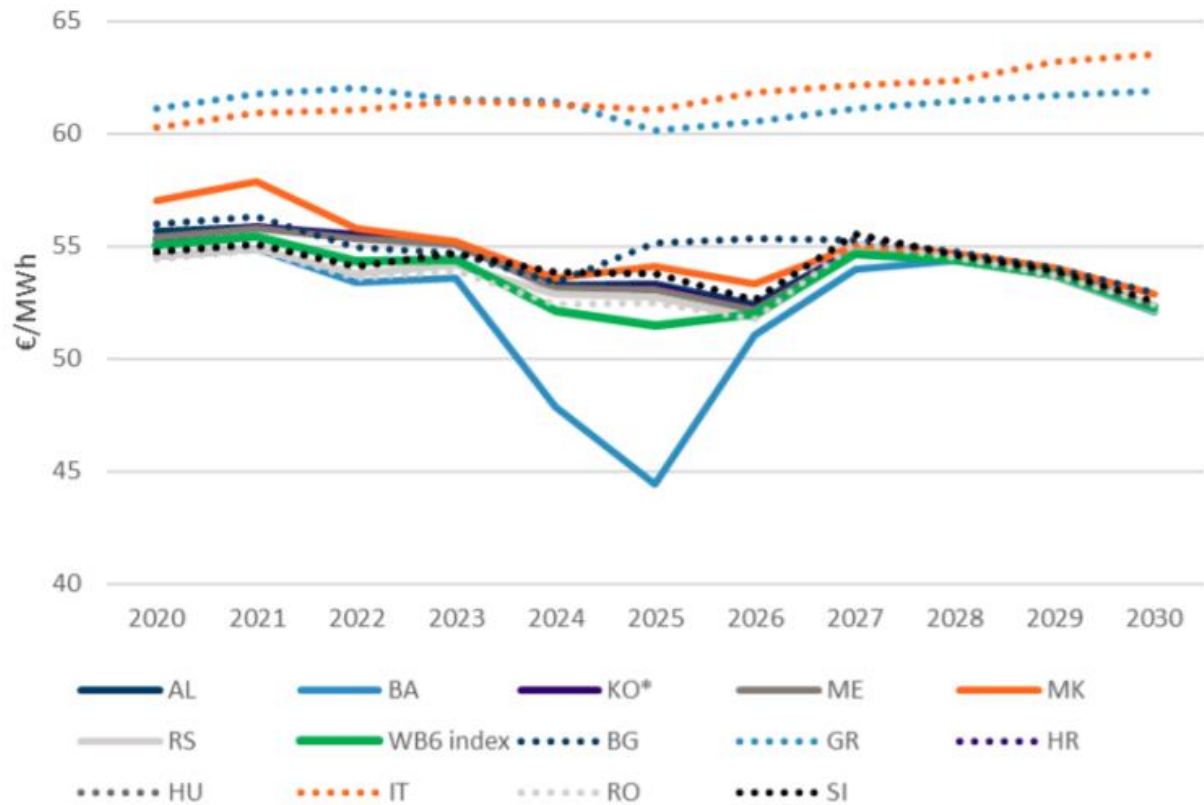
Merit order

- Currently producers in WB6 do not face the CO2 costs
 - Exemption: MN adopted CO2
- SRMC merit-order dispatch

CO2 costs add to marginal costs



Electricity wholesale price outlook – TSO’s base case



Price convergence due to good level of cross-border capacity

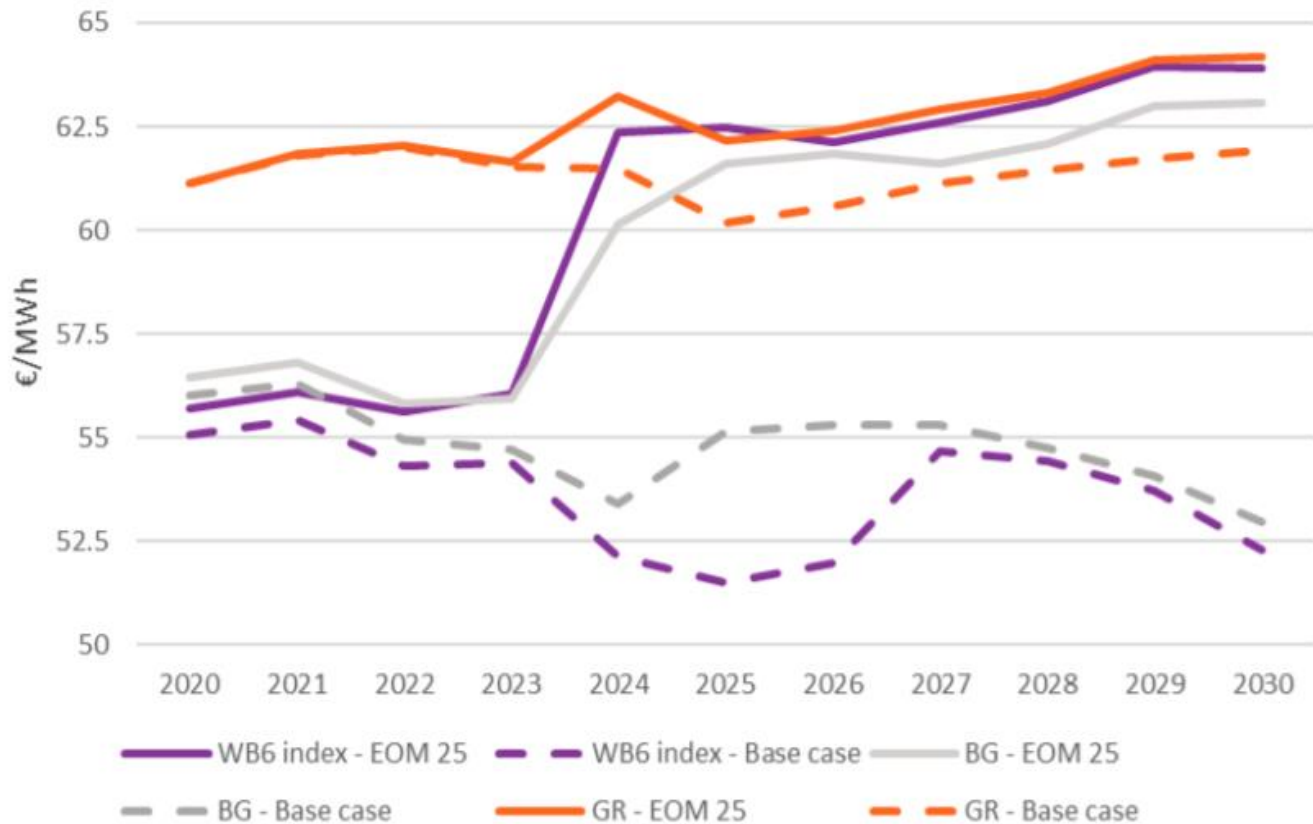
Plants in EU pay for CO2

WB6 no CO2 price in base case

In BiH new lignite capacity modelled pushes the price down, new x-border capacity brings back the convergence

Source: FTI-CL.

Electricity wholesale price outlook – EU ETS 2025



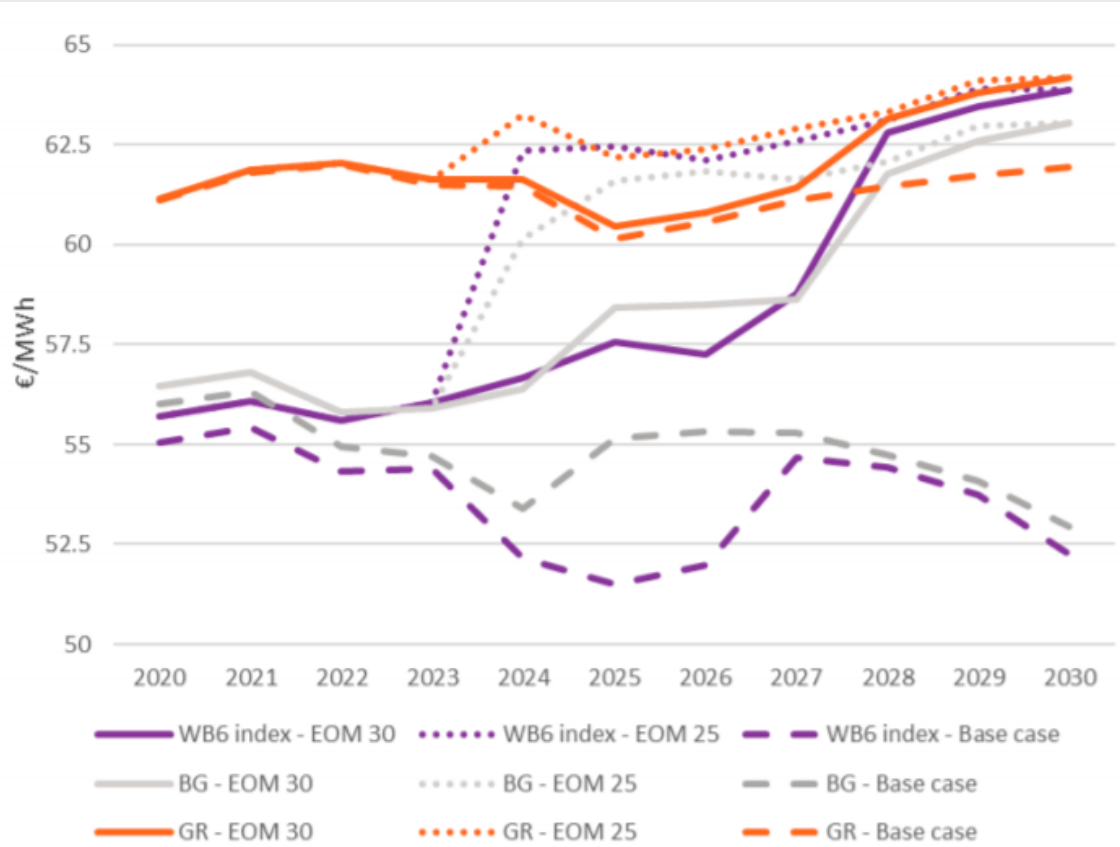
Under market conditions the some of the plants planned in base case are cancelled (economic)

Price increase in 2024 due to economic cancellation resulting from high costs from LCPD compliance

Application of CO2 price from 2025 results with convergence of WB6 and regional prices

Source: FTI-CL

Electricity wholesale price outlook – EU ETS 2030



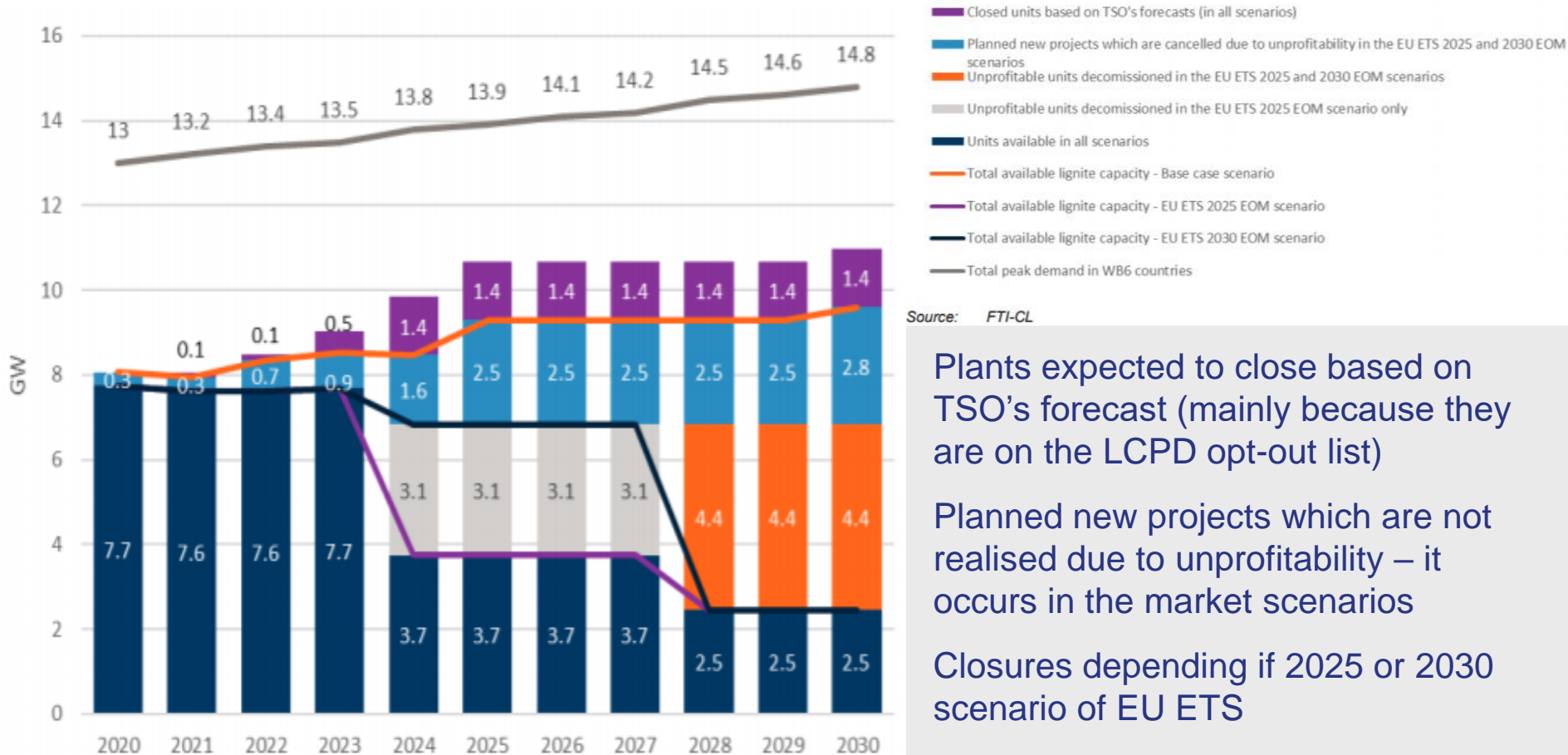
Implementation of a CO2 pricing, either from 2025 or 2030, has the same result on investment decisions made between 2020 and 2023

Some plants cancelled in 2024 (in 2025 scenario) continue to operate

Expected introduction of a CO2 pricing in 2030 worsens the economic situation of existing plants, which cannot cover the IED refurbishment costs

Source: FTI-CL

Net capacities in three scenarios



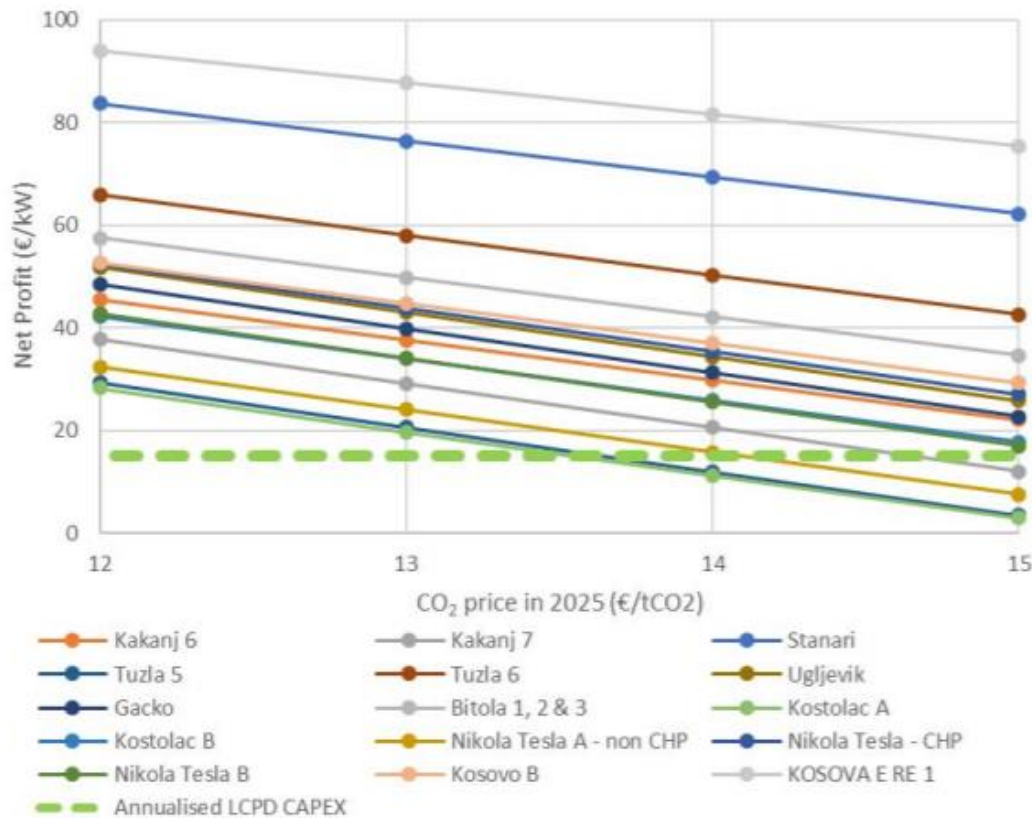
Source: FTI-CL

Plants expected to close based on TSO's forecast (mainly because they are on the LCPD opt-out list)

Planned new projects which are not realised due to unprofitability – it occurs in the market scenarios

Closures depending if 2025 or 2030 scenario of EU ETS

CO2 price – the breakeven point



The CO2 13-14€/t and higher from 2025 would have impact on PP profitability => would be the 'switching' point in the merit order

Higher prices would make LCPD refurbishment investments unprofitable for the least efficient plants by late 2023.

The CO2 price assumed in 2025 in the WB6 region in the EU ETS 2025 market scenario is equal to 22.5€/tCO2. This high carbon price results in several lignite closures which are avoided with a price equal to 13-14€/tCO2.

Note: Net profit should be compared with annualised LCPD CAPEX (the green dotted line).
 Source: FTI-CL

Market can play a crucial role in de-carbonization:

- Well designed scheme for CO₂ and level playing field (potential transition)
- Full compliance with environmental norms (set by LCPD and IED)
- Efficient regional market (market coupling, exchange of reserves)
- Efficient utilization of cross-zonal capacity (calculation => use)
- Integrating RES in the market (through fixed premium contracts)
- DSR

The background is a satellite-style image of the Earth at night, showing city lights. Overlaid on this are numerous glowing blue lines that represent energy transmission paths, connecting various points across the globe.

Thank you!

www.energy-community.org

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