Impact of CO2 on electricity market

15 Dec 2020

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In focus

- De-carbonization … through market means
- Fuel switch
- Impact of the CO2 price in the WB6
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- Conclusions
Gas wins recognition as ‘transitional technology’ to climate neutrality

By Dave Keating | EURACTIV.com

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

What does the market say!? 

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

Source: https://ember-climate.org/data/carbon-price-viewer/
Modelling for WB6

- 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
  - 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
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, 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*
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.
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
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.
Conclusion

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
Thank you!

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