



**WHY NOT ETS? COMPARATIVE
ASSESSMENT OF BORDER
CARBON ADJUSTMENT AND THE
EXTENSION OF ETS IN THE
POWER SECTOR IN EUROPE**

**ANDRÁS MEZŐSI (REKK)
ZSUZSANNA PATÓ (RAP)
LÁSZLÓ SZABÓ (REKK)**

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Research questions

Context: Creating a level playing field for European industry is a goal of both the upcoming new Industrial Policy and the Green Deal as well. The proposed policy tool for carbon pricing is a border carbon adjustment (BCA)

1. What will be the impact of a BCA on power sector CO² emissions in the EU and on the neighbouring countries exporting to the EU?
2. How will fossil power plants be impacted in the EU and in the EU exporting countries? How does it affect the coal phaseout in Europe and the capacity plans in the exporting regions?
3. How much revenue will be generated? What are the welfare effects of a BCA on producers and consumers?
4. How would the extension of the EU ETS to these countries compare to the BCA?

Assumptions and scenarios

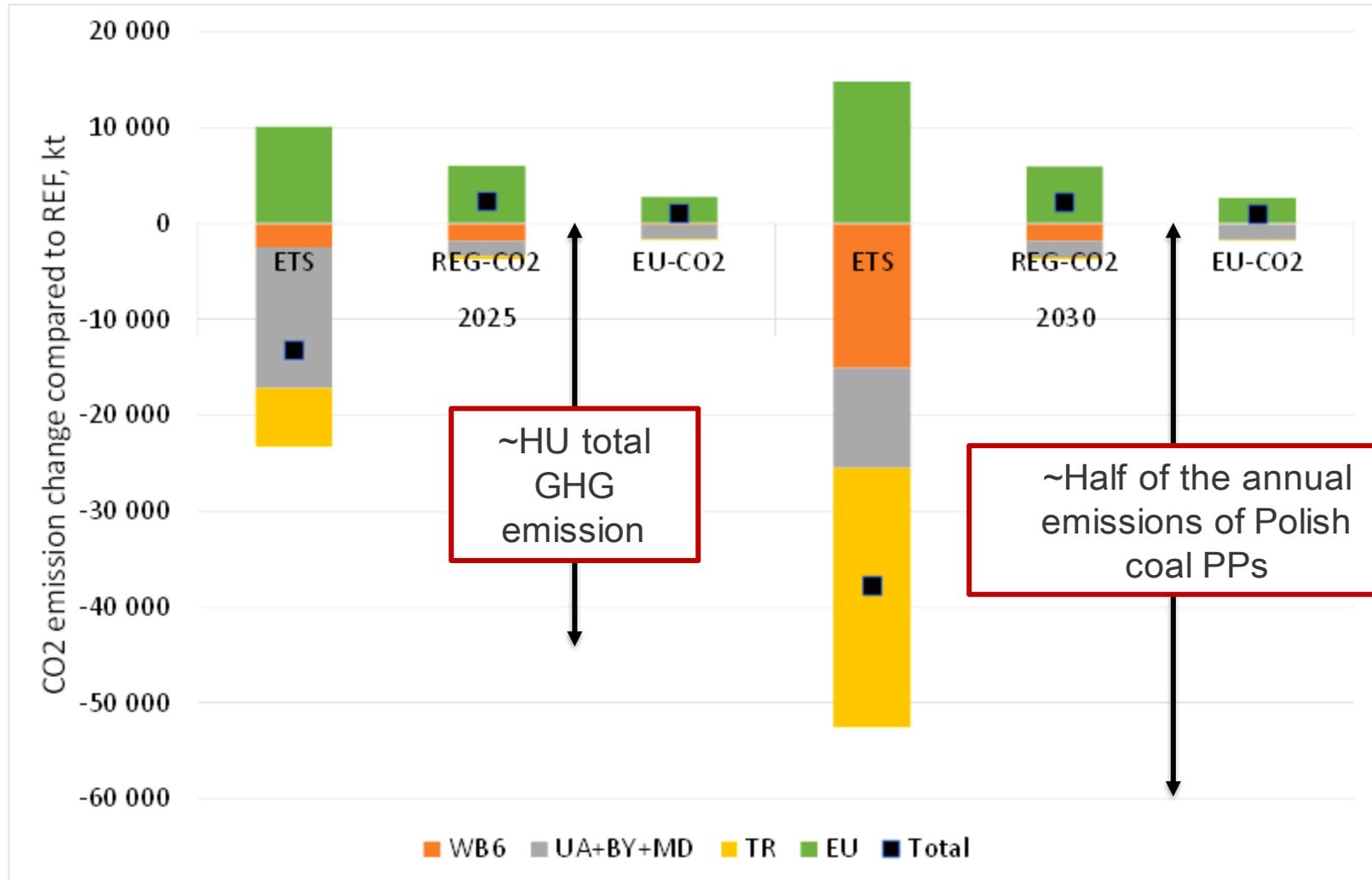
1. There are no realistic alternative design options to the extension of the ETS and the border carbon adjustment: Guarantees of origin would involve high transaction cost and potential fraud issues when applied to the power sector.
2. Three scenarios:
 - ETS+: ETS extended to all modelled non-EU regions from 2025
 - REG-CO²: BCA based on carbon intensity of the import source, non-ETS region
 - EU-CO²: BCA based on the EU+ average carbon intensity
3. Modelling outputs are defined as change compared to the REF scenario for 2025 and 2030 (except wholesale price)
 - CO² emissions
 - Electricity generation mix
 - Welfare effect
 - Weighted average wholesale price
 - BCA revenue

	CO2 intensity in REF scenario, t/MWh		CO2 tax level, €/MWh	
	2025	2030	2025	2030
EU+	0.22	0.16	5.42	5.01
WB6	0.72	0.64	18.00	19.73
UA+BY+MD	0.29	0.21	7.28	6.42
TR	0.40	0.33	9.95	10.17

The modelling framework

1. Model used: [European Electricity Market Model \(EEMM\)](#)
2. Spain-Morocco and Baltics-Russia trade is not included
3. Regions defined as price regions:
 - Non-EU countries - 3 regions (REG)
 - WB6
 - Eastern Europe (BY, UA_W, UA_E, MD)
 - Turkey
 - EU+ countries: EU27+CH, NO, UK
4. CO₂ price based on EUCO32325 scenario: 2025: 25.1€/t; 2030: 30.6€/t
5. Sensitivity analysis on CO₂ price: +/-10€/t in 2025 and 2030

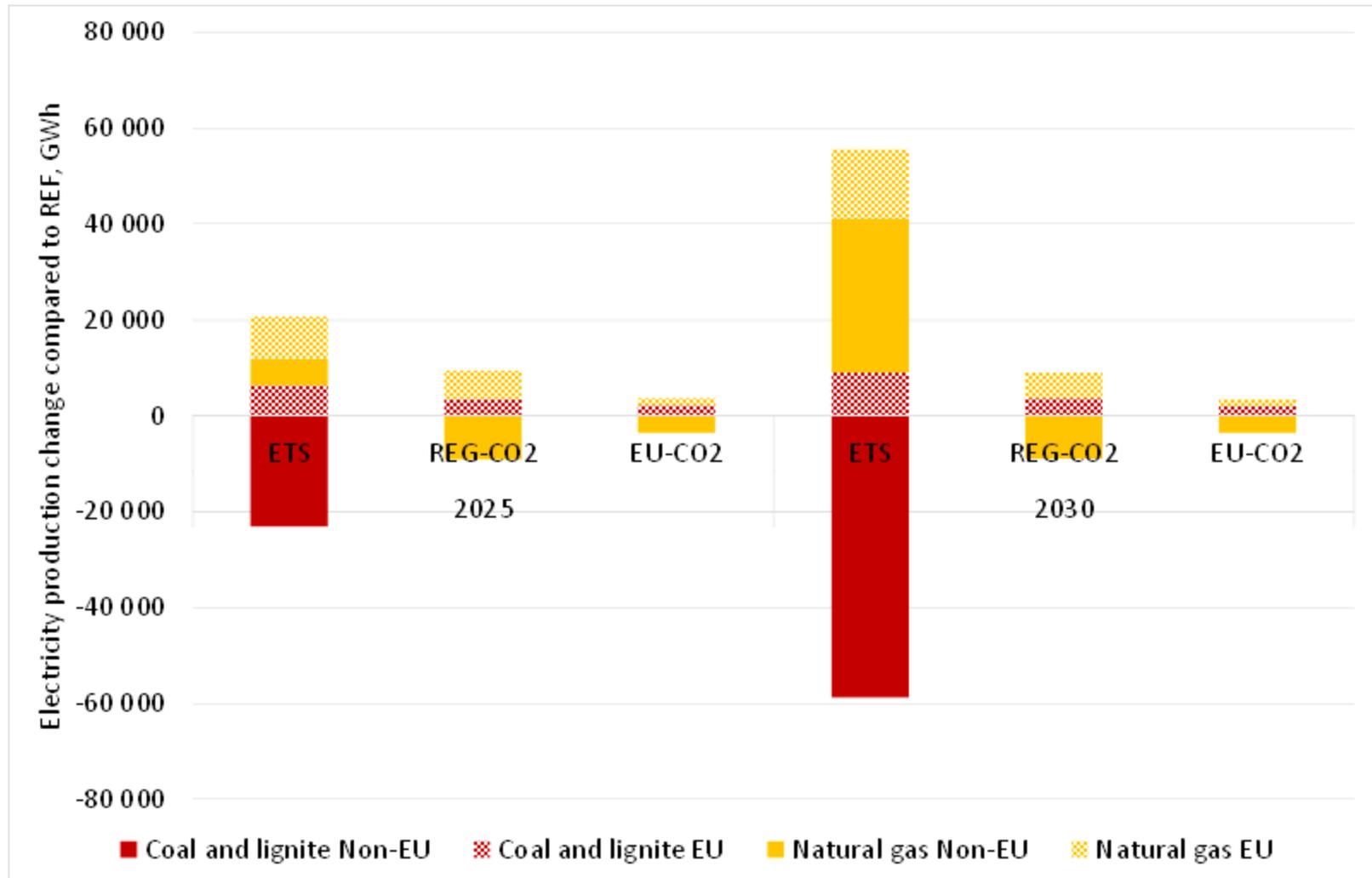
Impact on CO₂ emissions



Impact on CO² emissions

1. BCA and ETS extension (ETS+) have markedly different impacts:
 - BCA increases overall CO² emissions, ETS+ reduces
 - In case of BCA: The EU+ emissions increase exceeds the reduction in the exporting regions
 - In case of ETS+: The reduction in the exporting countries is much more substantial
 - Magnitude of change is higher in case of ETS+
2. EU+ emissions will increase regardless the policy tool employed
3. Higher level BCA results in larger change, but this is less important, relatively speaking, that the policy tool used to create level playing field

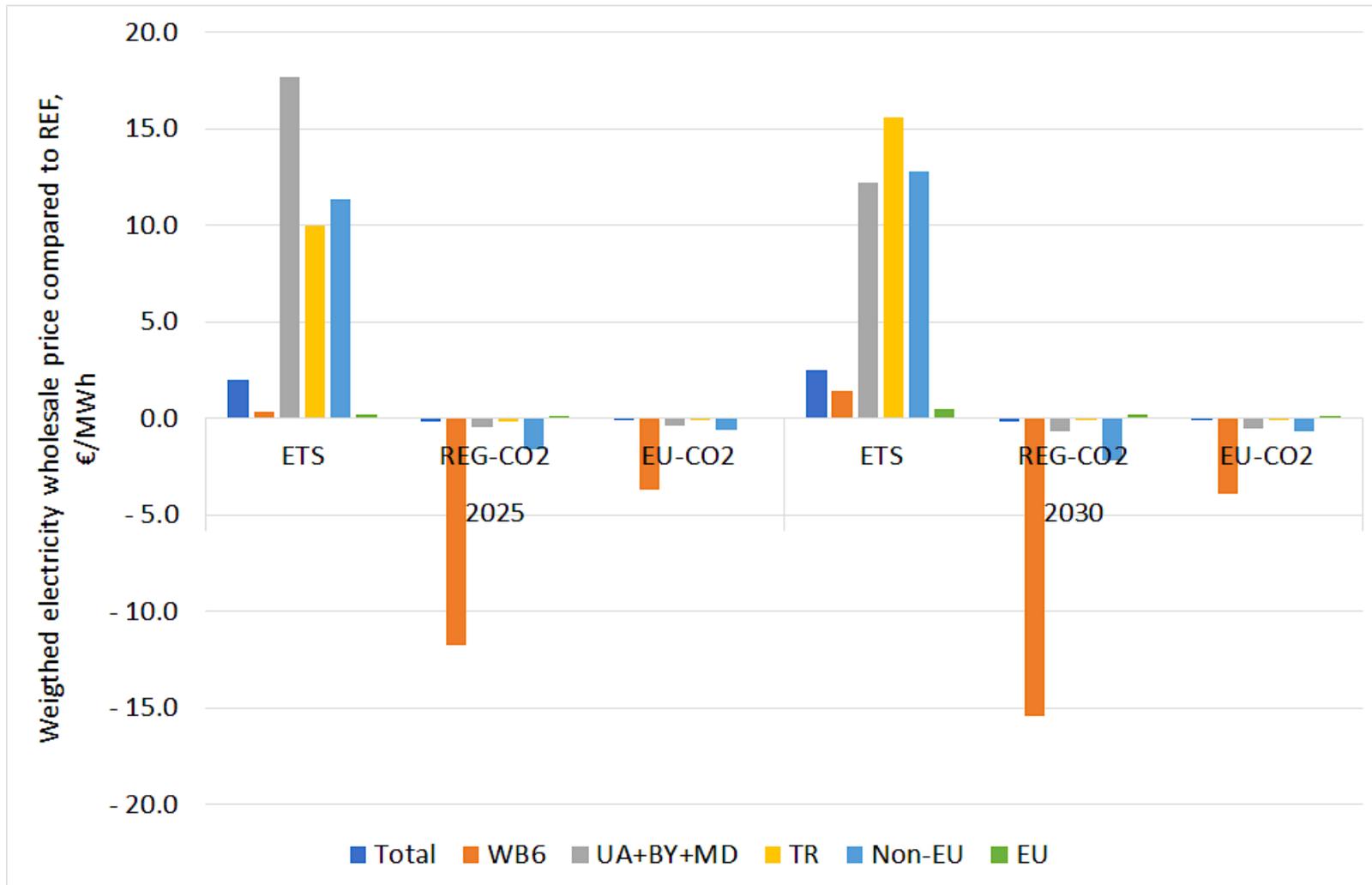
Impact on the electricity mix



Impact on the electricity mix

1. BCA and ETS extension (ETS+) have markedly different impacts:
 - Magnitude of change is higher in case of ETS+
 - in case of BCA: Non-EU coal/lignite-based generation will be sold to domestic consumers (instead of exporting) and crowd out domestic gas
 - In case of ETS+: Non-EU coal/lignite will be substituted by EU coal/lignite and gas in general if all power plants operate under ETS from 2025 due to the change in the merit order

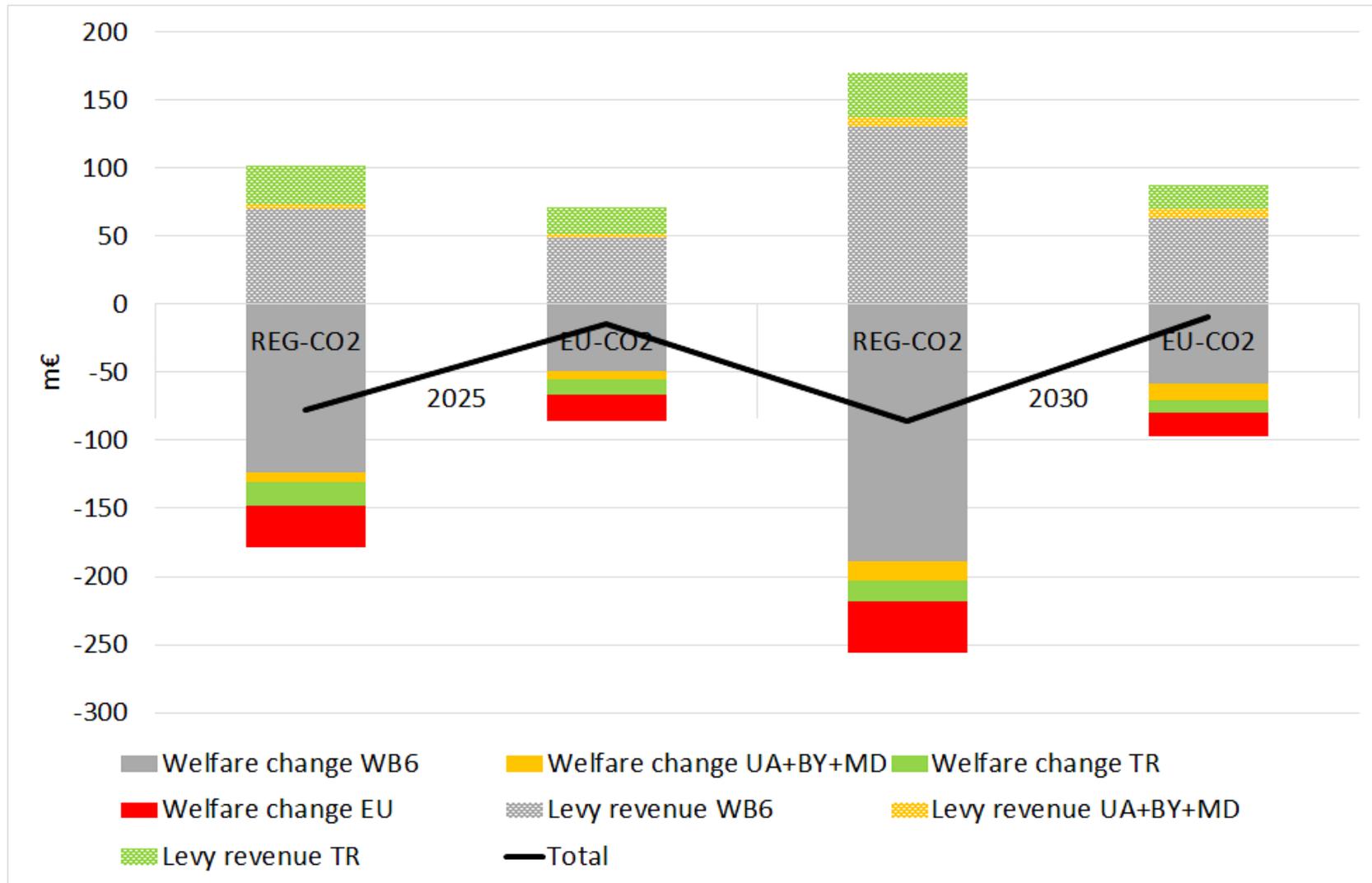
Impact on wholesale electricity price



Wholesale price impact

1. No price impact in EU+ at all
2. BCA and ETS extension (ETS+) have markedly different impact:
 - ETS+ has a stronger and across-the-board price increase impact
 - In case of ETS+: 10 EUR price increase in non-EU
 - In case of BCA: No impact, with the exception of WB6, where the price falls with 10-15% (resulting in a 10 EUR spread at higher BCA level): This is due to the high level of (physical) integration of WB6 with EU+ (compared to integration of the other regions with the EU+)

Annual revenue generated compared to the welfare impact of BCA



Annual revenue generated compared to the impact on welfare

The BCA design assumes that the revenue is collected at the trade transaction, by the EU.

1. Higher BCA level, higher revenues, higher welfare impact
2. Annual revenue generated by the BCA is in the (e)100-150 mEUR range (Just Transition Fund is 7.5 bn EUR for 2021-2027: approx. 1 bn per year)
3. WB6-EU+ is the dominant trade/revenue generating relation
4. Total welfare impact for non-EU is similar in size to the revenue generated in total and per non-EU trading region as well

Results: ETS+ and BCA are very different

- (Lack of) impact on merit order effect has profound impact
- Level of BCA level is secondary

	ETS+	BCA
CO2 emissions total	Reduce	Increase
CO2 emissions EU+	Increase	Increase
Power mix	NonEU coal is crowded out by gas and EU coal	No impact on coal-based generation at all but hits on nonEU gas: "reshuffling" in nonEU
Wholesale price	No impact in EU+ 10 EUR increase in nonEU	No impact in EU+ No impact in nonEU (except WP6)
Welfare and revenue	On order of magnitude higher than BCA	Approx. symmetric for each non-EU trading region

ETS revenues from an extended EU ETS

CO2 revenue, m€						
	2025			2030		
	LOW CO2	REF	High CO2	LOW CO2	REF	High CO2
CO2 price, €/t	15.1	25.1	35.1	20.6	30.6	40.6
AL	0	0	0	0	0	0
BA	336	554	653	431	559	621
KO	109	180	198	145	181	184
ME	24	40	57	32	48	62
MK	70	120	154	65	104	141
RS	384	612	471	554	535	492
BY	36	60	113	128	191	267
MD	97	160	224	137	202	246
UA_W	0	0	0	0	0	0
UA_E	725	967	1 130	523	697	855
MD	97	160	224	137	202	246
TR	2 202	3 521	4 152	2 586	3 126	3 599
WB6	923	1 507	1 533	1 227	1 426	1 501
UA+BY+MD	857	1 188	1 467	787	1 090	1 367
TR	2 202	3 521	4 152	2 586	3 126	3 599

Messages

Extending the ETS to the power sector of neighbouring countries is a better solution than BCA as

- It brings real competition: Non-EU regions would become more integrated into the EU single market with a level playing field, and results in lower GHG emissions, whereas BCA fences EU power sector and results in GHG emissions increase.
- Lower WB6 prices in the BCA can hamper the energy transition by
 - Reducing the incentives for energy efficiency investments
 - Increase the need for RES support
 - Discouraging low-carbon generation investments
- BCA revenues (if channeled back to non-EU trading countries) are negligible compared to ETS revenues: lower funding for the energy transition
- Several EU neighbouring countries already plan carbon pricing at the national level (inferior to an extended EU ETS)
- Governance structure for implementing EU climate legislation is already in operation: Energy Community