

A close-up photograph of a hand holding a small, vibrant green plant with several leaves. The hand is positioned at the bottom left, and the plant grows upwards towards the top center of the frame. The background is a plain, light-colored wall.

**WHY NOT ETS?
COMPARATIVE ASSESSMENT OF
CBAM AND THE EXTENSION OF ETS IN
EUROPE IN THE POWER SECTOR**

András Mezősi (REKK)

Zsuzsanna Pató (RAP)

László Szabó (REKK)

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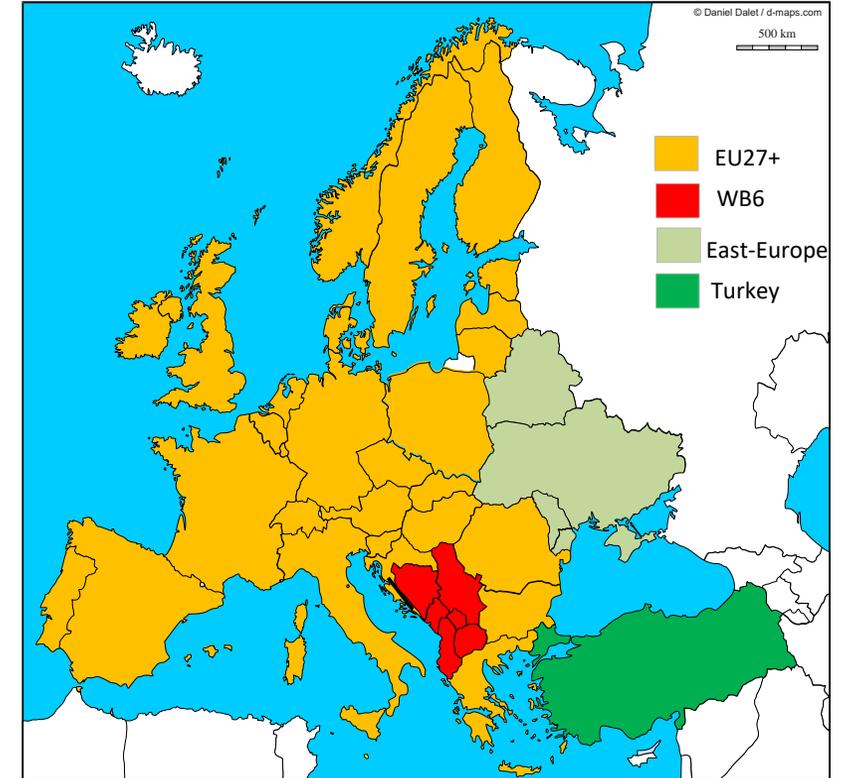
Research questions

Context: creating 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 Carbon Border Adjustment Mechanism (CBAM)

1. What will be the impact of a CBAM on **power sector** CO₂ emissions in the EU and on the neighbouring countries exporting to the EU?
2. **How fossil PPs will 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 CBAM on producers and consumers?
4. How would the **extension of the EU ETS** to these countries would compare to the **CBAM**?

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
 - East-Europe (BY, UA_W, UA_E, MD)
 - Turkey
 - EU27+ countries: EU27+CH, NO, UK
4. CO₂ price based on EUCO32325: 2025: 25.1; 2030: 30.6€/t
5. Sensitivity analysis on CO₂ price: +/-10€/t in 2025 and 2030



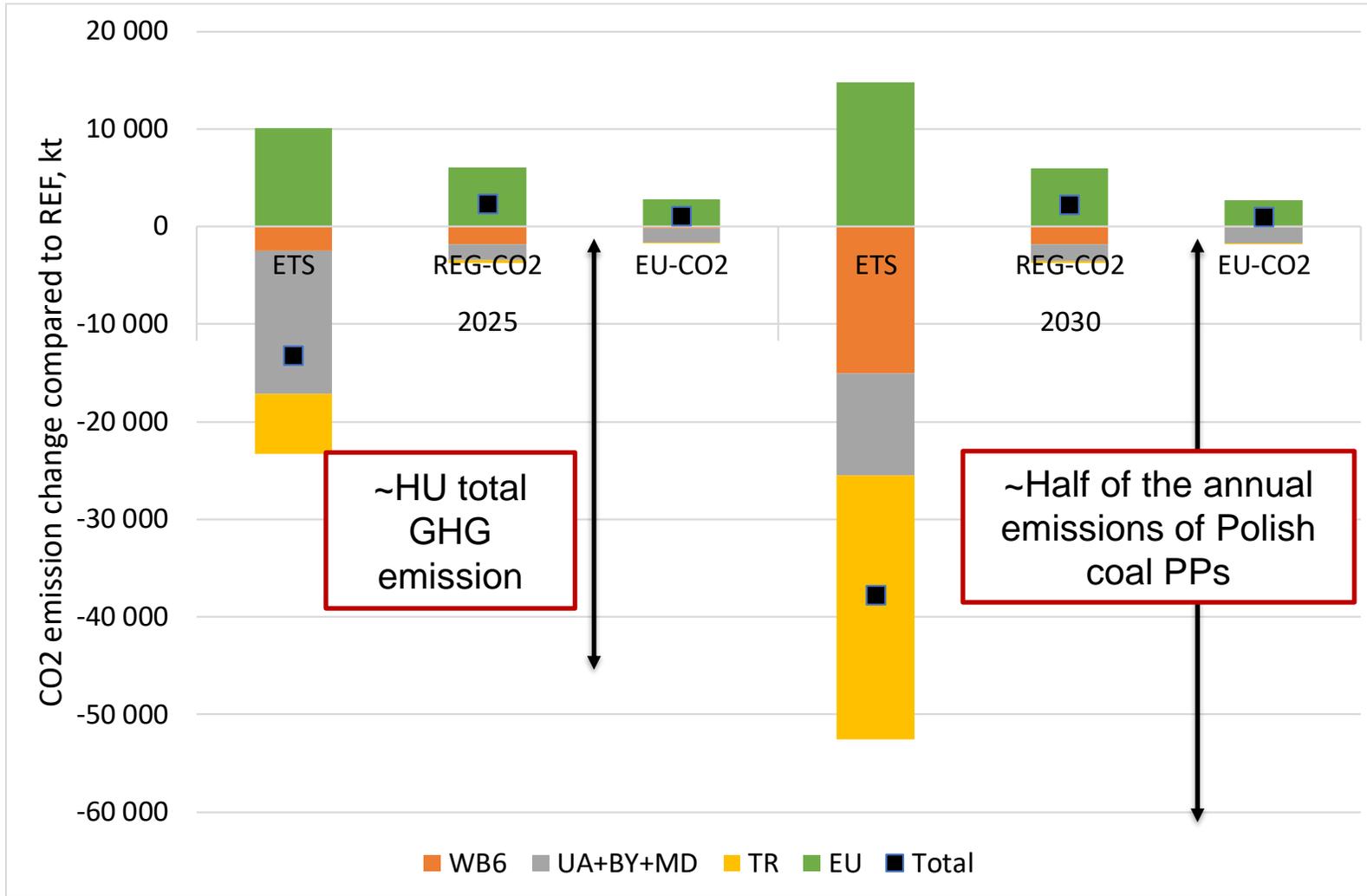
Assumptions and scenarios

1. Comparison of ETS extension and CBAM
2. Three (+one REF) scenarios are assessed:
 - ETS+: ETS extended to all modelled non-EU regions from 2025
 - REG-CO2: CBAM is based on carbon intensity of the import source of the non-ETS region
 - EU-CO2: CBAM is based on the EU+ average carbon intensity
 - REF: No carbon regime outside the EU
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
 - CBAM/ETS 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

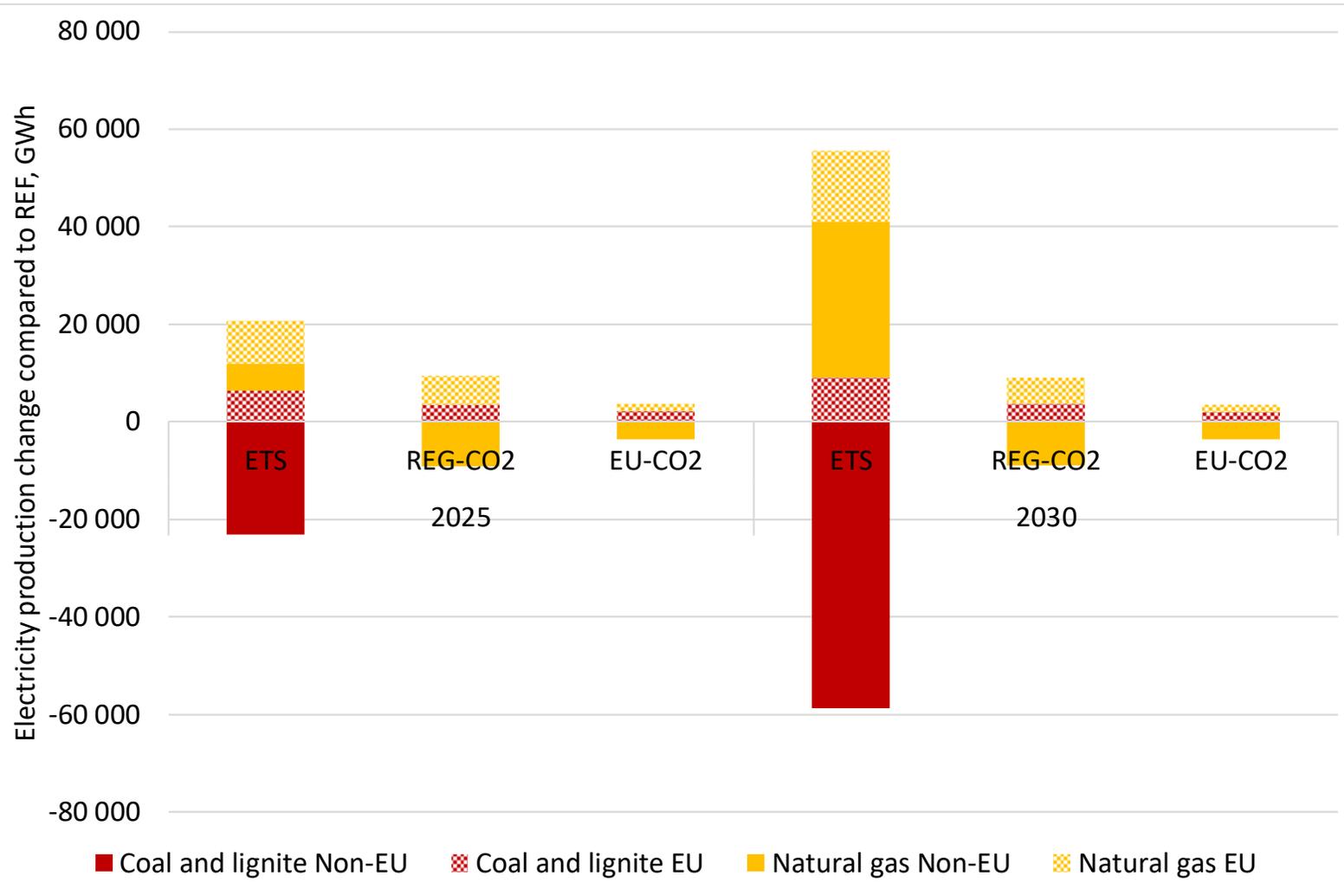
Based on REKK modelling

Impact on CO₂ emissions



- CBAM and ETS extension (ETS+) have markedly different impacts:
 - CBAM increases overall CO₂ emissions, ETS+ reduces
 - in case of CBAM: 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+
- EU+ emissions will increase regardless the policy tool employed
- Higher level CBAM results in larger change, but this is relatively less important that the policy tool used to create level playing field

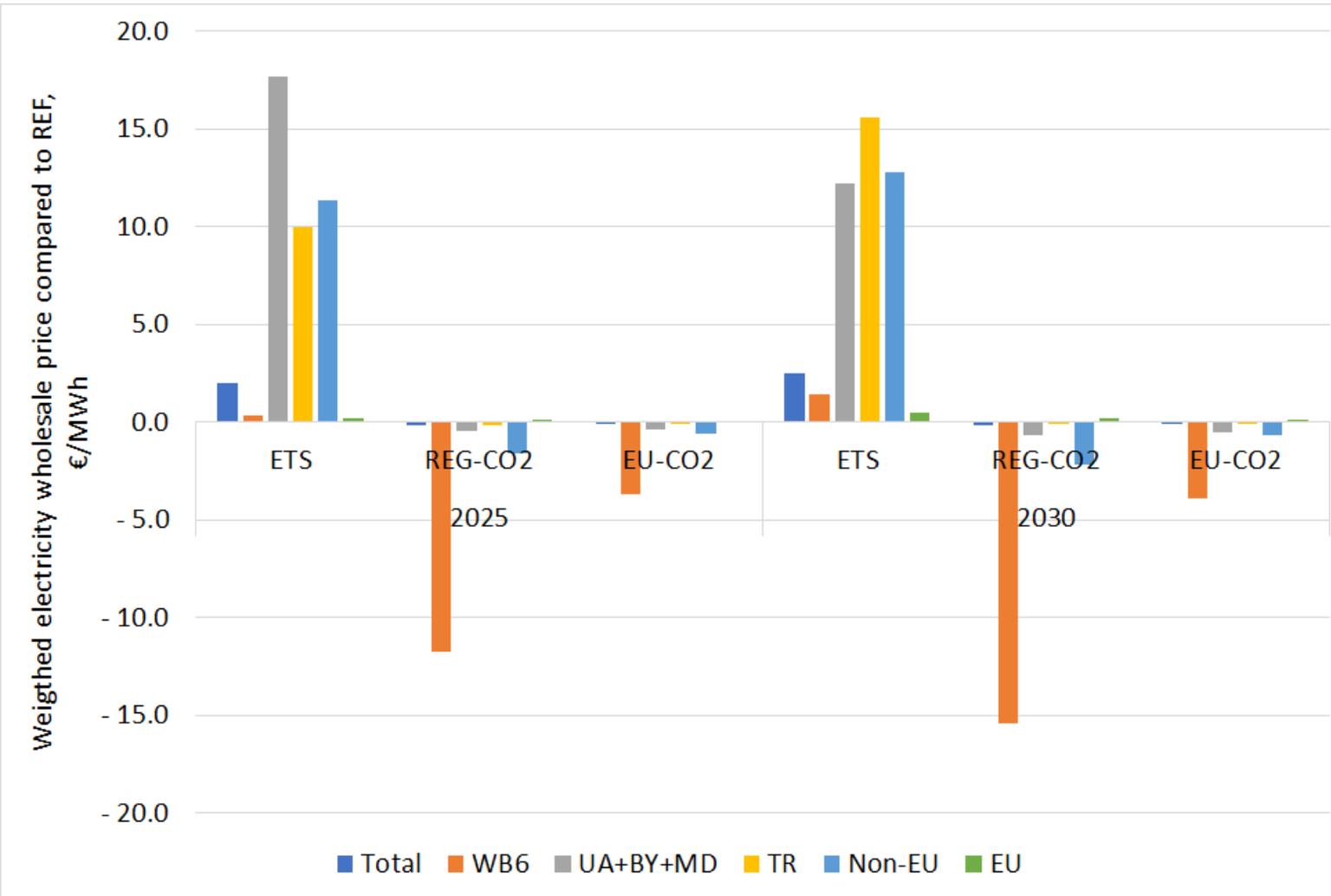
Impact on the electricity mix



CBAM and ETS extension (ETS+) have markedly different impacts:

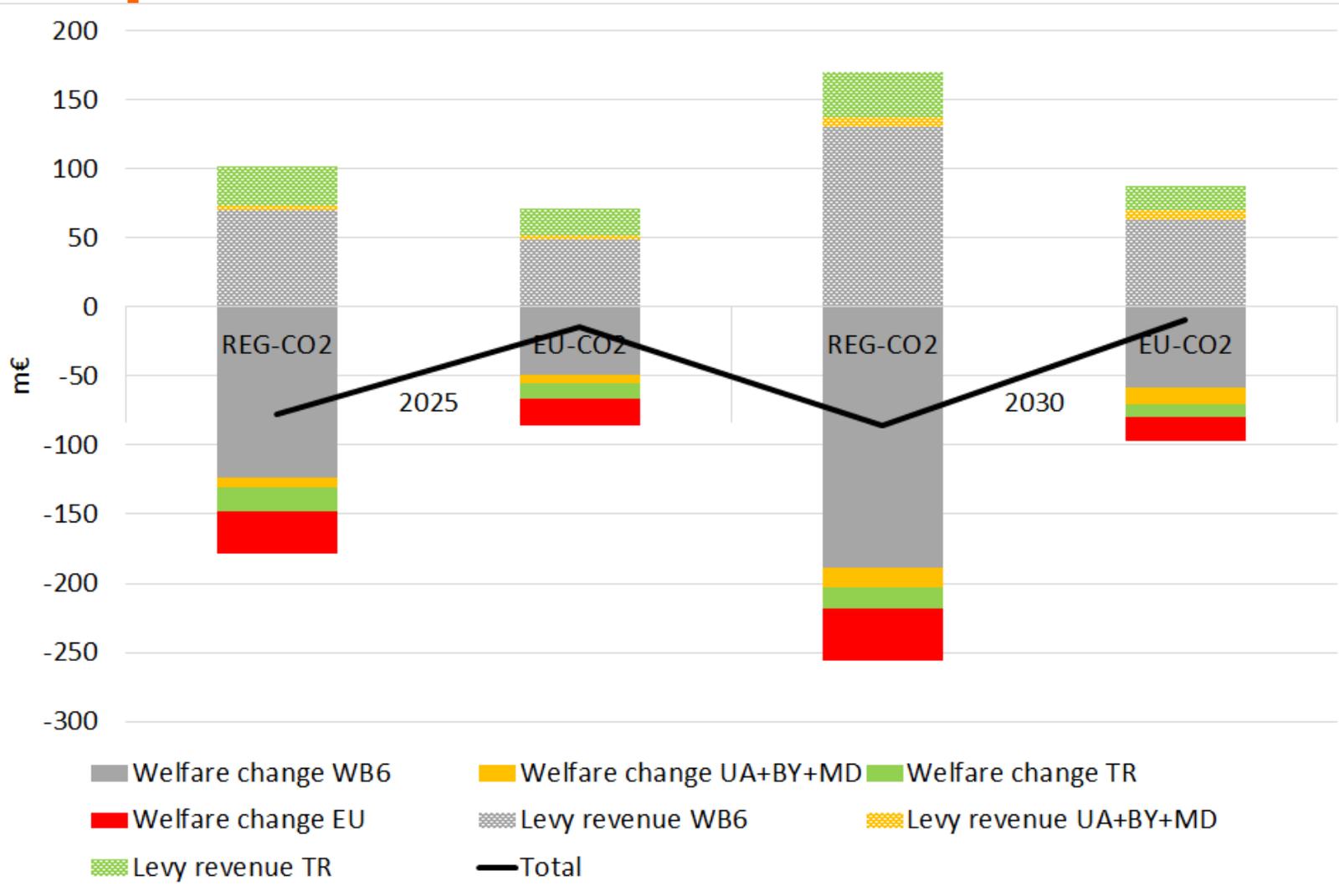
- Magnitude of change is higher in case of ETS+
- in case of CBAM: Non-EU coal/lignite-based generation will be sold to domestic consumers (instead of exporting) and crowd out domestic gas
- In case of ETS+: Non-EU coal/lignite will be substituted by EU coal/lignite and gas in general if all PPs operate under ETS from 2025 due to the change in the merit order

Impact on wholesale electricity price



- No price impact in EU+ at all
- CBAM 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 nonEU
 - In case of CBAM: no impact, with the exception of WB6 where the price falls with 10-15% (resulting in a 10 EUR spread at higher CBAM 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 CBAM



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

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

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

Results: ETS+ and CBAM are very different

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

	ETS+	CBAM
CO ₂ emissions total	Reduce	Increase
CO ₂ 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 WB6)
Welfare and revenue	On order of magnitude higher than CBAM	Approx. symmetric for each non-EU trading region

Conclusions

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

- it brings **real competition**: nonEU regions would get more integrated to the EU single market with level playing field and results in lower GHG emissions, whereas CBAM fences EU power sector and results in GHG emissions increase.
- lower WB6 prices in the CBAM can **hamper the energy transition** by
 - Reducing the incentives for energy efficiency investments
 - Increase the need for RES support
 - Discouraging low carbon generation investments
- **CBAM revenues** (if channeled back to non-EU trading countries) are negligible compared to ETS revenues: **lower funding for the energy transition**
- several non-EU countries already plan carbon pricing at the national level (inferior to an extended EU ETS)

Thank you for your attention!

András Mezősi

Andras.mezosi@rekk.hu

www.rekk.hu

Producer surplus (PS), consumer surplus (CS) and cross-border transmission rent change in the three scenarios, compared to reference scenario, in 2025 and 2030

