Implications of EU Carbon Border Adjustment Mechanism for Turkey

July 28, 2021

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Roundtable on
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Outline

- Approach
- Presentation of results
- Key observations

EU CBAM 'near-term' implication

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General approach and assumptions:

- Calculation estimates the additional burden incurred by Turkish exporters to the EU27 of selected products in 2026 (assumed to be the first year in force of CBAM entailing financial adjustments)
- CBAM cost calculation is based on **3 components**:
  1. The **carbon intensity** value of a product (expressed in tCO_2/t of product, or tCO_2/GWh): The additional cost imposed on exports assumed to be based on a default carbon intensity value e.g. the average carbon intensity of EU producers, or of the producers in the exporting country.
  2. The **volume of exported products:** Exports quantity (tons, GWh) in 2026 assumed unchanged compared to 2017-2019 annual average.
  3. The **carbon price** (EUR/t CO_2): The level of adjustment (EUR/t CO_2) would mirror the price of emissions allowances under the EU ETS - assumed price of EUR 70/t CO_2 in 2026
- Analysis of the first order effect of the trade impact bilaterally between Turkey and the EU, assuming unchanged trade flows compared to average 2017-19 values.
- Different CBAM scenarios assess the range of possible impact of CBAM design (see next two slides)
- Sectors of interest: Electricity, cement, aluminium, steel

Scenarios (1)

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- Six scenarios (see next slide) that reflect possible CBAM design
- Based on options for 2 CBAM design elements:
  1. CO_2 intensity (t CO_2 emissions/ton of product)
     - 1a. Exporting country-specific average (nonEU CO2intensity),
     - 1b. EU average (EU CO2intensity),
     - 1c. Differential between average intensity in the exporting country and the EU (ΔCO2intensity).
  2. Crediting of foreign climate policy:
     - 2a. Yes - CBAM will credit policies in exporting countries entailing a carbon price (ΔCO2 price);
     - 2b. No - the full EU carbon price will apply to exports (EUACO2price)
- For each of the six scenarios, results presented for two cases:
  - I. CBAM will account for direct emissions only (Scope 1)
  - II. CBAM will account for direct emissions (Scope 1) & indirect emissions (Scope 2)

Scenarios (2)

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	Scenario	Approach to calculating CBAM burden	Explanatory notes
No foreign carbon price crediting	(1)	$EUA_{CO2\ price} * EU_{CO2\ intensity}$	• Carbon price for imports to EU equals price of EU ETS allowances ($EUA_{CO2\ price}$) • Exporters emissions determined based on average CO_2 intensity of EU producers ($EU_{CO2\ intensity}$)
	(2)	$EUA_{CO2\ price} * nonEU_{CO2\ intensity}$	• Carbon price for imports to EU equals price of EU ETS allowances ($EUA_{CO2\ price}$) • Exporters emissions determined based on average CO_2 intensity in exporting countries (non$EU_{CO2\ intensity}$)
	(3)	$EUA_{CO2\ price} * \Delta_{CO2\ intensity}$	• Carbon price for imports to EU equals price of EU ETS allowances ($EUA_{CO2\ price}$) • Exporters pay for the part of average CO_2 intensity in exporting countries in excess to the average EU CO_2 intensity ($\Delta_{CO2\ intensity}$)
With foreign carbon price crediting	(4)	$\Delta_{CO2\ price} * EU_{CO2\ intensity}$	• Crediting for foreign carbon pricing policies (carbon tax or ETS), carbon price for imports equals the difference between EU ETS allowance price and carbon prices in exporting countries ($\Delta_{CO2\ price}$) • Exporters emissions determined based on average CO_2 intensity of EU producers ($EU_{CO2\ intensity}$)
	(5)	$\Delta_{CO2\ price} * nonEU_{CO2\ intensity}$	• Crediting for foreign carbon pricing policies (carbon tax or ETS), carbon price for imports equals the difference between EU ETS allowance price and carbon prices in exporting countries ($\Delta_{CO2\ price}$) • Exporters embedded in imports determined based on the average CO_2 intensity in exporting countries (non$EU_{CO2\ intensity}$)
	(6)	$\Delta_{CO2\ price} * \Delta_{CO2\ intensity}$	• Crediting for foreign carbon pricing policies (carbon tax or ETS), carbon price for imports equals the difference between EU ETS allowance price and carbon prices in exporting countries ($\Delta_{CO2\ price}$) • Exporters pay for the part of average CO_2 intensity in exporting countries in excess to the average EU CO_2 intensity ($\Delta_{CO2\ intensity}$)

Electricity

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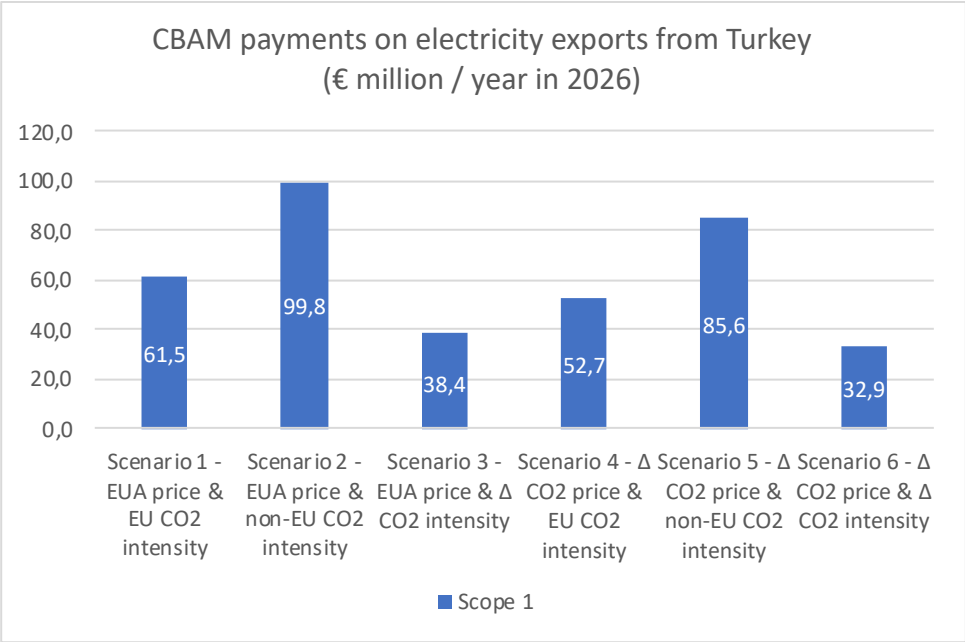
	Grid emissions factor - tCO_2/GWh
EU27	290
Turkey	471



Notes:

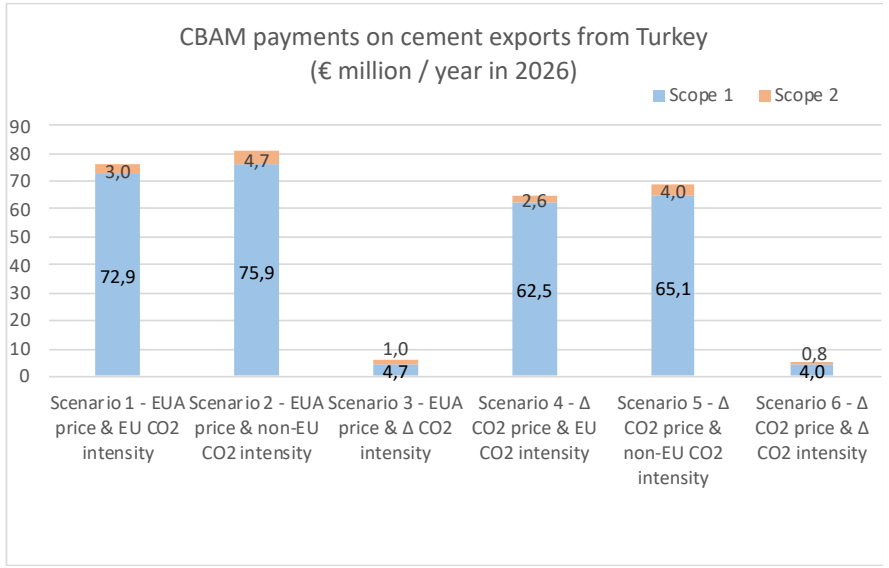
- EU27: grid emissions factor value for year 2018; source: European Environment Agency
- Turkey: grid emissions factor value for year 2018; source: calculated based on UNFCCC GHG inventory and el. production.

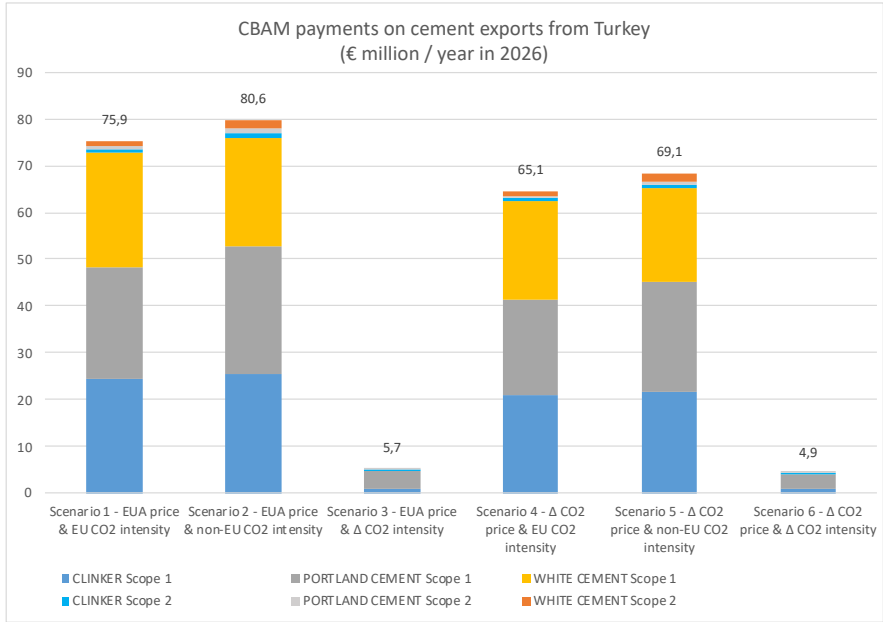
Cement

		CO_2 intensity - tCO_2/ton of clinker	
		Scope 1 emissions	**Scope 1 & 2 emissions**
Clinker	**EU27**	0,813	0,835
	Turkey	0,843	0,875
Portland cement	**EU27**	0,630	0,664
	Turkey	0,731	0,783
White cement	**EU27**	1,073	1,121
	Turkey	1,001	1,077

Notes:

- Scope 1 intensity values sourced from the Getting the Numbers Right (GNR) database managed by the Global Cement and Concrete Association (GCCA).
- Scope 2 intensities calculated based on electricity intensity data from GNR, and electricity grid emissions factors
- Regional granularity of GNR data: for Turkey clinker and Portland cement data concern the region 'Middle East', white cement data concern 'world'





Cement – CBAM payment/current prices

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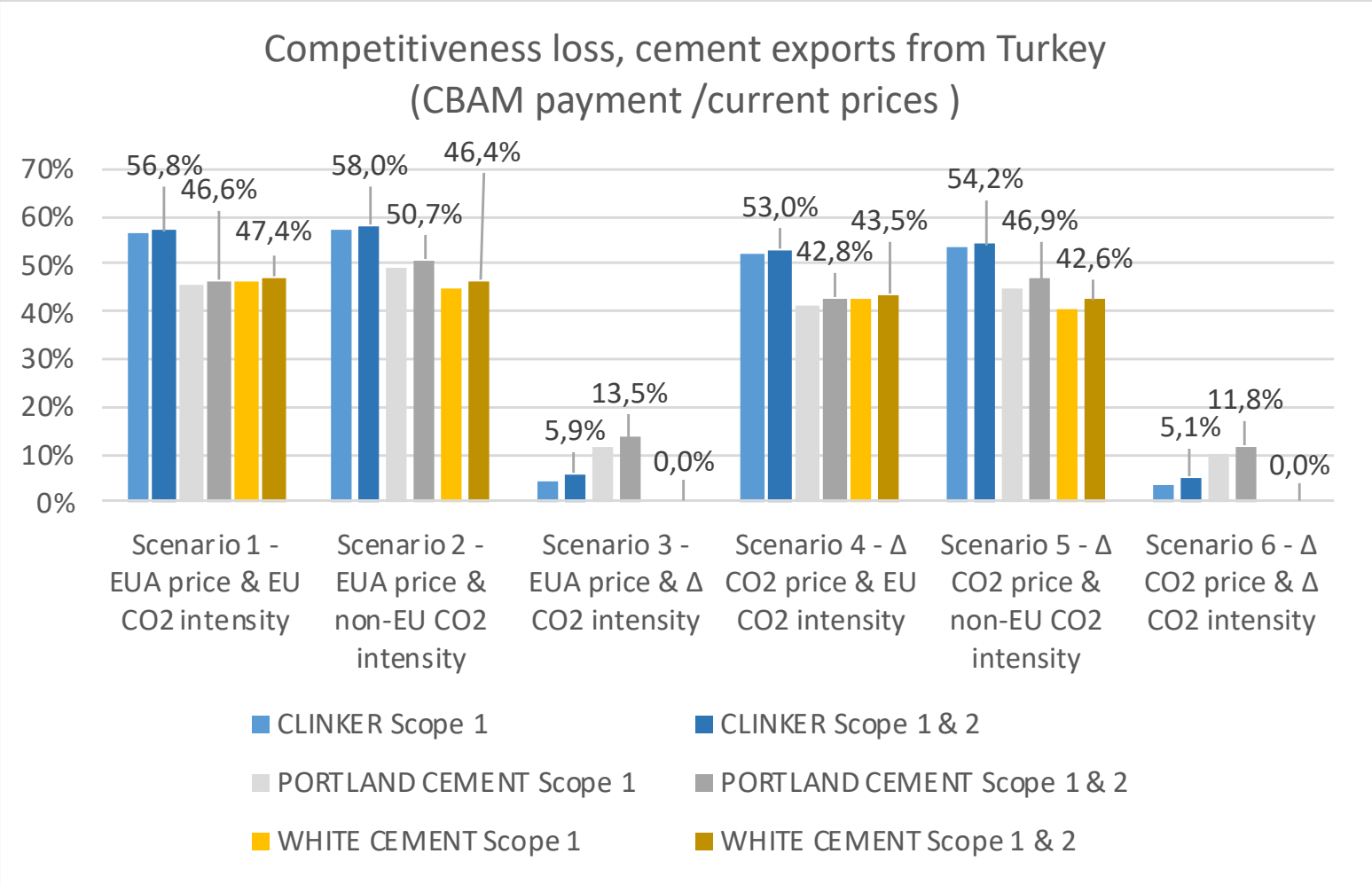

Steel

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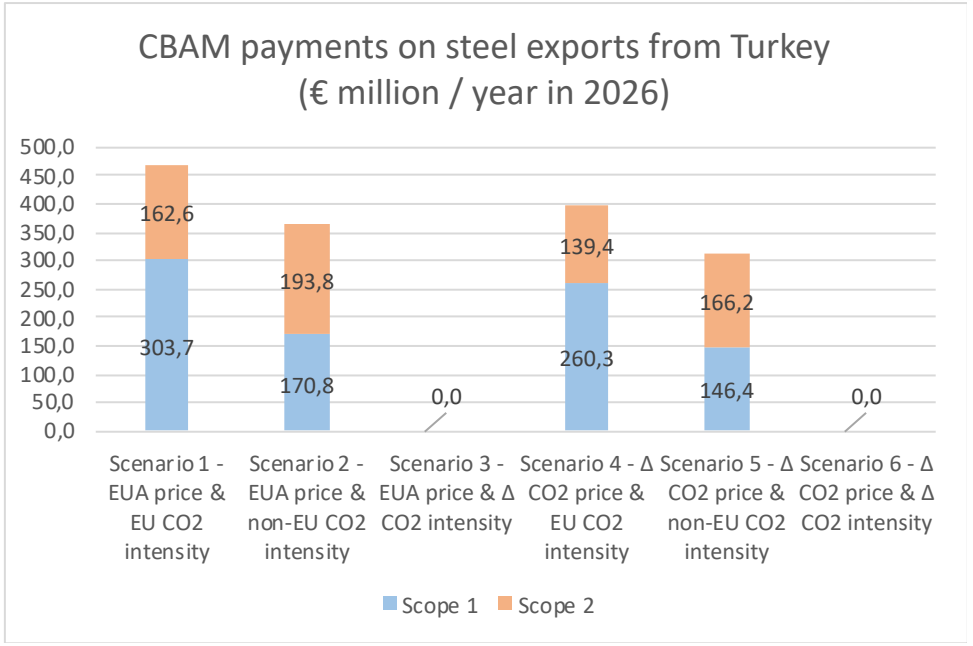
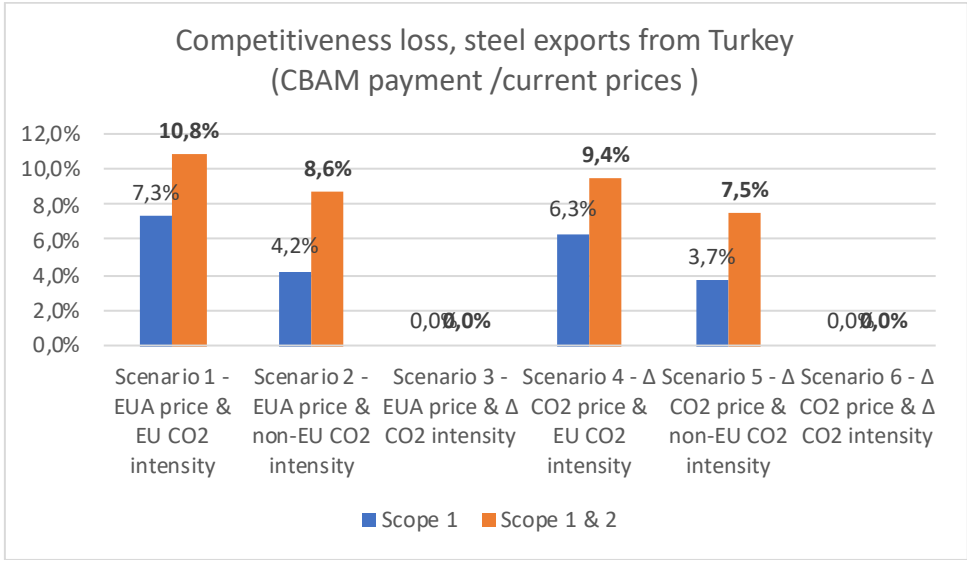
	CO_2 intensity - tCO_2/ton of crude steel	
	Scope 1 emissions	Scope 1 & 2 emissions
EU27	0,71	1,09
Turkey	0,40	0,85

Notes:

- CO_2 intensities for crude steel calculated based on:
  - Emission intensities associated with specific production routes (BF-BOF, scrap-based EAF) from IEA Iron and Steel Technology Roadmap (2020)
  - Crude steel production mix by process technology based on World Steel Association data





Aluminium (1)

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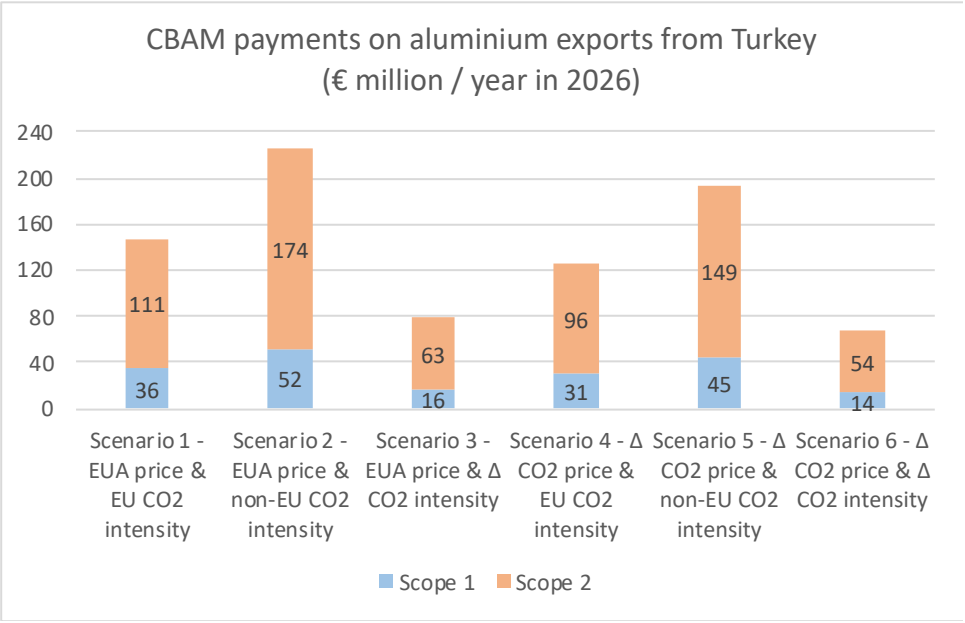
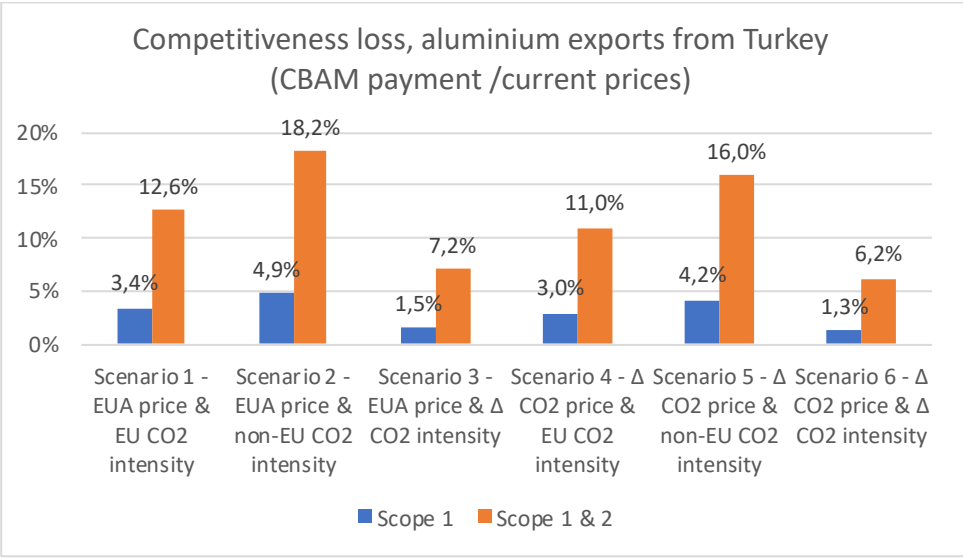
	CO_2 intensity - tCO_2/ton of primary aluminium	
	Scope 1 emissions	Scope 1 & 2 emissions
EU27	1,5	5,95
Turkey	2,1	9,12

Notes:

- Scope 1 intensity
  - EU: equal to the EU ETS benchmark (1,464 tCO_2/ton), which is based on the average emissions of the 10% best performing installations rather than the average of all EU installations
  - Turkey: based on global average data by International Aluminium Institute (IAI).
- Scope 2 intensity:
  - Based on IAI data concerning electricity intensity and electricity grid emissions factors





Aluminium (2)

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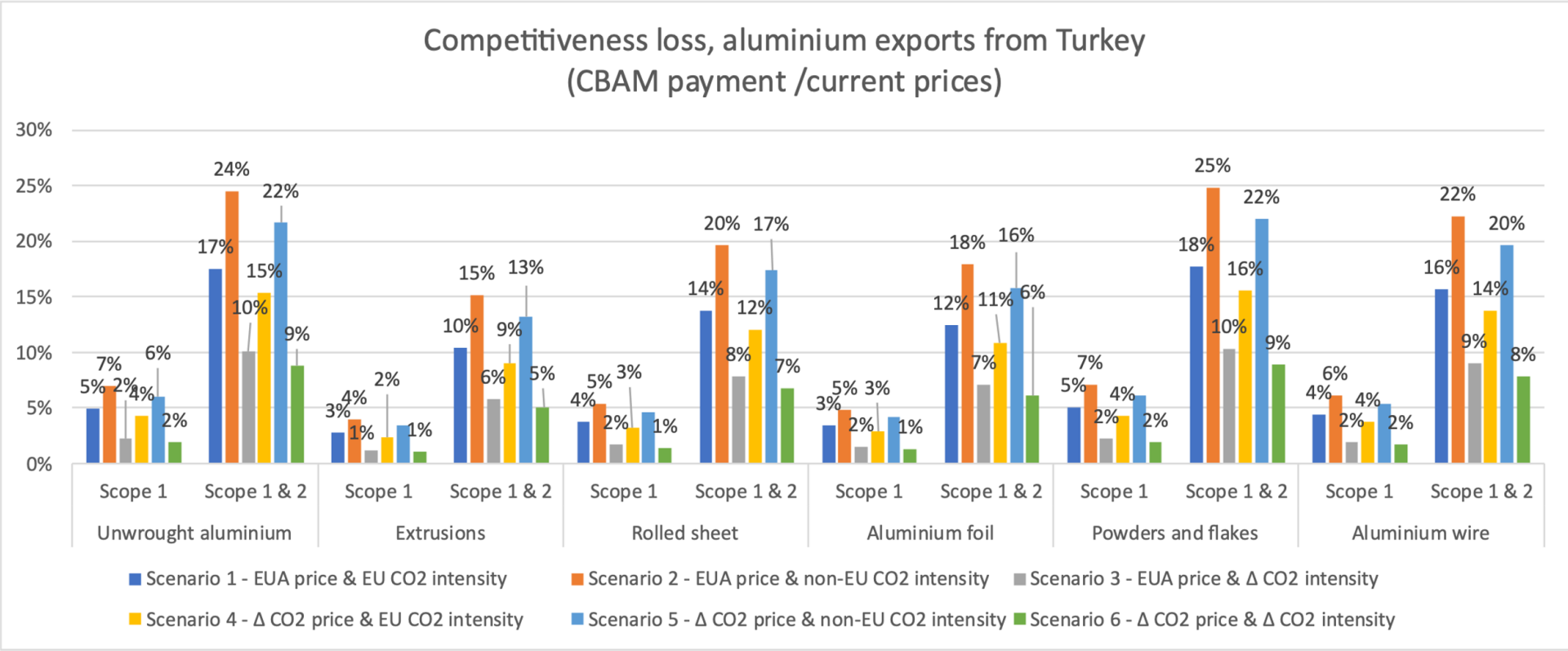

CBAM payments in 2026 - total

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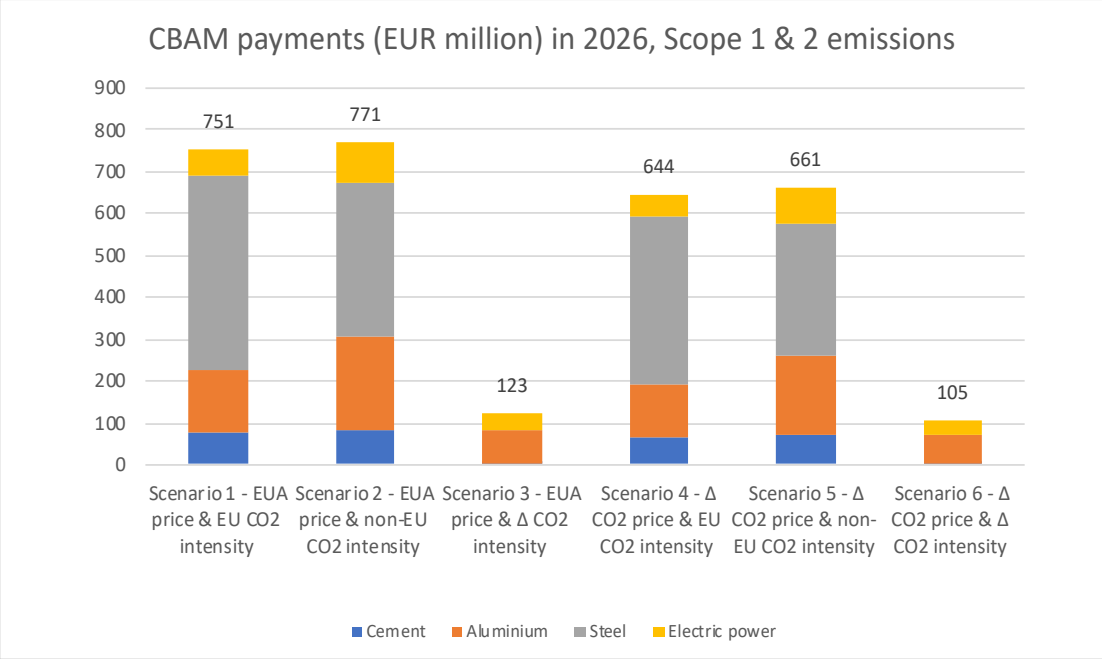

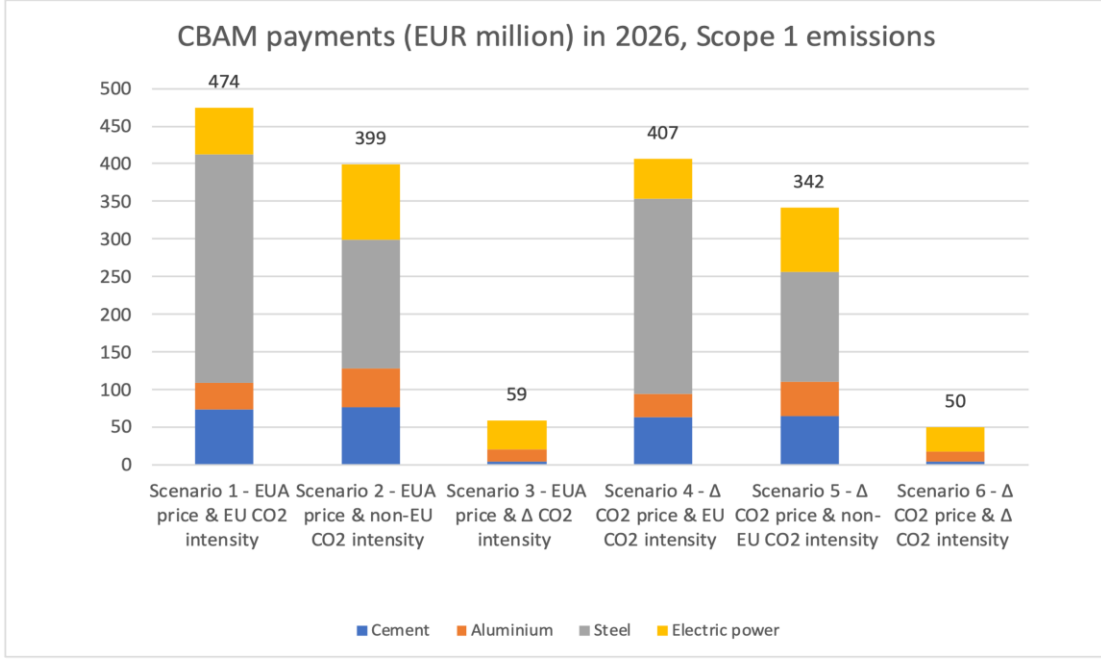

CBAM "bill" at the border for the four sectors of electricity, cement, steel and aluminium:

- EUR 771 million in 2026 if CBAM covers Scope 1 & 2 emissions (Scenario 2)
- EUR 399 million in 2026 if CBAM covers Scope 1 emissions (Scenario 2)

Key observations (1)

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- Energy-intensive and trade-exposed (EITE) sectors like cement, steel, aluminum, as well as electricity are highly likely candidates to be covered by CBAM in the near to medium-term.
- Turkish exporters of electricity, cement, steel, and aluminum products could face a total CBAM "bill" at the border of EUR 771 million in 2023 million (Scenario 2; Scope 1 & 2 emissions); CBAM payments would represent 0,07% of Turkey's GDP forecast in 2023.
- If only Scope 1 emissions are covered, CBAM "bill" of EUR 399 million in 2026 (Scenario 2); about 0,04% of Turkey's GDP forecast in 2026.
- CBAM payments can represent a significant share of current prices for some products
  - e.g. ~50% in the cement sector, 18% aluminium, 11% for steel
  - Differentiated by product type. The higher in the value chain the lower the share e.g. up to 24% for unwrought aluminium, but up to 15% for extrusions.
- CBAM diversified impacts depending on adopted design, e.g. product scope, emissions scope, emissions intensity
- Impact in terms of CBAM payments and competitiveness much less pronounced under Scenarios 3 and 6 that assume a CBAM that will only apply to the part of exporters' emissions above the emissions of EU producers (ΔCO2intensity).

Key observations (2)

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- Product scope:
  - Analysis includes products listed in Annex I of the EC July 2021 CBAM proposal. Uncertainty on final list of products to be covered in each sector.
  - Steel & aluminium: Analysis assumes that a CBAM would apply to imports of raw materials (e.g. primary aluminium, crude steel), as well as certain semi-finished products and articles of these materials (e.g. aluminium rolled products, steel pipes).
    - Total 'CBAM bill' would be lower in case only upstream materials are covered, and higher the more downstream products in the value chain are covered.
- Choice of applicable default CO_2 intensity values (EU or foreign, etc) has a significant impact on costs:
  - Exporting country CO_2 intensity not necessarily higher than EU intensity (e.g. steel in Turkey)
  - Allow for process to challenge carbon intensity default values: foreign producers could be granted the possibility to individually prove that they are "cleaner" than any default values; This could potentially reduce the tax burden imposed by the EU CBAM
  - Level of the adjustment (EUR/tCO_2) has an important bearing on the magnitude of the impact:
    - Calculations based on CO_2 price forecast for 2026 EUR 70/tCO2;
    - Since May 2021 EU ETS prices > EUR 50tCO_2 are observed; Impact would be higher at increasing price levels that may be observed through to 2030.
    - Carbon pricing in exporting countries likely to be deducted from the payable level of adjustment (ΔCO_2 price), reducing CBAM burden.

Thank you!

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Appendix

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Turkey's exports to the EU27, 2017-19 avg

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SECTOR	CODE	PRODUCT*	Exports quantity (tons or GWh)	Exports value (EUR)
Cement**	**HS 252310, HS 252329, HS 252321**	**Clinker, portland and white cement**	**1.295.797 tons**	**76.325.291**
	HS 252310	Cement clinkers	431.095 tons	19.132.445
	HS 252329	Portland cement (excl. white, whether or not artificially coloured)	535.126 tons	28.462.503
	HS 252321	White portland cement, whether or not artificially coloured	329.496 tons	28.730.344
Aluminium	**HS 7601, 7603-7609**	**Unwrought aluminium and certain semi-processed aluminium products**	**354.746 tons**	**1.020.950.158**
	7601	Unwrought aluminium	35.693 tons	70.215.182
	HS 7604, 7408, 7409	Extrusions	106.084 tons	379.669.799
	HS 7606	Rolled sheet	129.493 tons	336.742.106
	HS 7607	Aluminium foil	70.128 tons	204.658.034
	HS 7603	Powders and flakes	538 tons	1.040.761
	HS 7605	Aluminium wire	12.810 tons	28.624.276
Iron and steel	**HS 7201, 7203, 7205-7229 and 7301-7311**	**Iron and steel and certain artciles thereof**	**6.130.316 tons**	**3.851.629.854**
	HS 72, except 7202 and 7204	Iron and steel (excl. ferro-alloys, ferrous waste and scrap, stainless steel and other alloys)	5.207.499 tons	2.973.865.238
	HS 7301-7311	Articles of iron and steel	922.817 tons	877.764.616
Electricity	**SIEC E7000**	**Electric power**	**3.028 GWh**	**n/a**

* Products in each sector are those listed in Annex I of EC July 2021 CBAM proposal

** For cement, product 'HS 2523 90 00 – Other hydraulic cements' is also included in the EC CBAM proposal, however, it is not included in the analysis due to low export volumes and lack of data with respect to emissions intensity.

Source: based on Eurostat 'EU trade since 1988 by HS2,4,6 and CN8' [DS-645593], and 'Imports of electricity and derived heat by partner country [nrg_ti_eh]'