



# Implications of EU Carbon Border Adjustment Mechanism for Turkey

## - draft results

July 12, 2021

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**ERCST**

Roundtable on  
Climate Change and  
Sustainable Transition

## Outline

- Approach
- Presentation of draft results
- Key observations

# EU CBAM 'near-term' implication

## General approach and assumptions:

- Calculation estimates the additional burden incurred by Turkish exporters to the EU27 of selected products in 2023 (assumed to be the first year of CBAM in force)
- CBAM cost calculation is based on **3 components**:
  1. The **carbon intensity** value of a product (expressed in tCO<sub>2</sub>/t of product, or tCO<sub>2</sub>/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 2023 assumed unchanged compared to 2017-2019 annual average.
  3. The **carbon price** (EUR/t CO<sub>2</sub>): The level of adjustment (EUR/t CO<sub>2</sub>) would mirror the price of emissions allowances under the EU ETS - assumed price of EUR 50/t CO<sub>2</sub> in 2023
- 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)

- Six scenarios (see next slide) that reflect possible CBAM design
- Based on options for 2 CBAM design elements:
  1. CO<sub>2</sub> intensity (t CO<sub>2</sub> emissions/ton of product)
    - 1a. Exporting country-specific average (nonEU CO<sub>2</sub>intensity),
    - 1b. EU average (EU CO<sub>2</sub>intensity),
    - 1c. Differential between average intensity in the exporting country and the EU ( $\Delta$ CO<sub>2</sub>intensity).
  2. Crediting of foreign climate policy:
    - 2a. Yes - CBAM will credit policies in exporting countries entailing a carbon price ( $\Delta$ CO<sub>2</sub> price);
    - 2b. No - the full EU carbon price will apply to exports (EUACO<sub>2</sub>price)
- 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)

No foreign carbon price crediting

With foreign carbon price crediting

Scenario	Approach to calculating CBAM burden	Explanatory notes
(1)	$EUA_{CO2\ price} * EU_{CO2\ intensity}$	<ul style="list-style-type: none"> <li>Carbon price for imports to EU equals price of EU ETS allowances (<math>EUA_{CO2\ price}</math>)</li> <li>Exporters emissions determined based on average CO<sub>2</sub> intensity of EU producers (<math>EU_{CO2\ intensity}</math>)</li> </ul>
(2)	$EUA_{CO2\ price} * nonEU_{CO2\ intensity}$	<ul style="list-style-type: none"> <li>Carbon price for imports to EU equals price of EU ETS allowances (<math>EUA_{CO2\ price}</math>)</li> <li>Exporters emissions determined based on average CO<sub>2</sub> intensity in exporting countries (<math>nonEU_{CO2\ intensity}</math>)</li> </ul>
(3)	$EUA_{CO2\ price} * \Delta_{CO2\ intensity}$	<ul style="list-style-type: none"> <li>Carbon price for imports to EU equals price of EU ETS allowances (<math>EUA_{CO2\ price}</math>)</li> <li>Exporters pay for the part of average CO<sub>2</sub> intensity in exporting countries in excess to the average EU CO<sub>2</sub> intensity (<math>\Delta_{CO2\ intensity}</math>)</li> </ul>
(4)	$\Delta_{CO2\ price} * EU_{CO2\ intensity}$	<ul style="list-style-type: none"> <li>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 (<math>\Delta_{CO2\ price}</math>)</li> <li>Exporters emissions determined based on average CO<sub>2</sub> intensity of EU producers (<math>EU_{CO2\ intensity}</math>)</li> </ul>
(5)	$\Delta_{CO2\ price} * nonEU_{CO2\ intensity}$	<ul style="list-style-type: none"> <li>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 (<math>\Delta_{CO2\ price}</math>)</li> <li>Exporters embedded in imports determined based on the average CO<sub>2</sub> intensity in exporting countries (<math>nonEU_{CO2\ intensity}</math>)</li> </ul>
(6)	$\Delta_{CO2\ price} * \Delta_{CO2\ intensity}$	<ul style="list-style-type: none"> <li>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 (<math>\Delta_{CO2\ price}</math>)</li> <li>Exporters pay for the part of average CO<sub>2</sub> intensity in exporting countries in excess to the average EU CO<sub>2</sub> intensity (<math>\Delta_{CO2\ intensity}</math>)</li> </ul>

## Electricity

### Grid emissions factor - tCO<sub>2</sub>/GWh

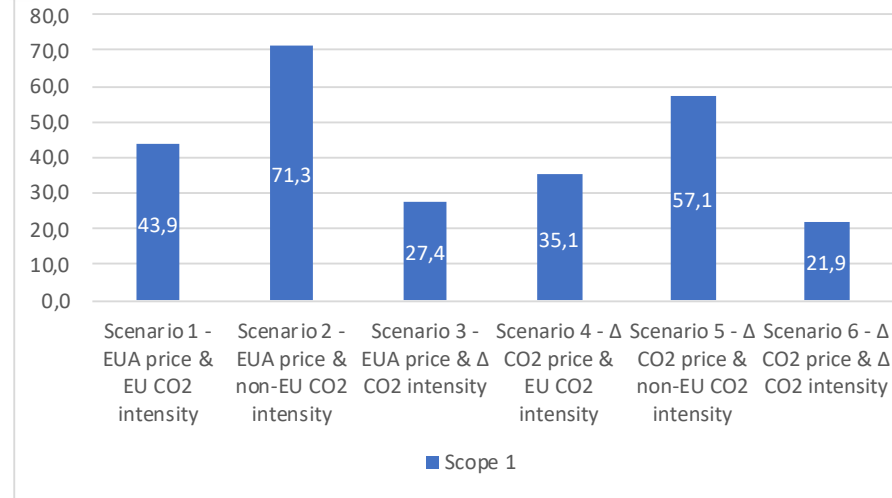
<b>EU27</b>	290
<b>Turkey</b>	471

#### 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.

Preliminary results

CBAM payments on electricity exports from Turkey  
(€ million / year in 2023)



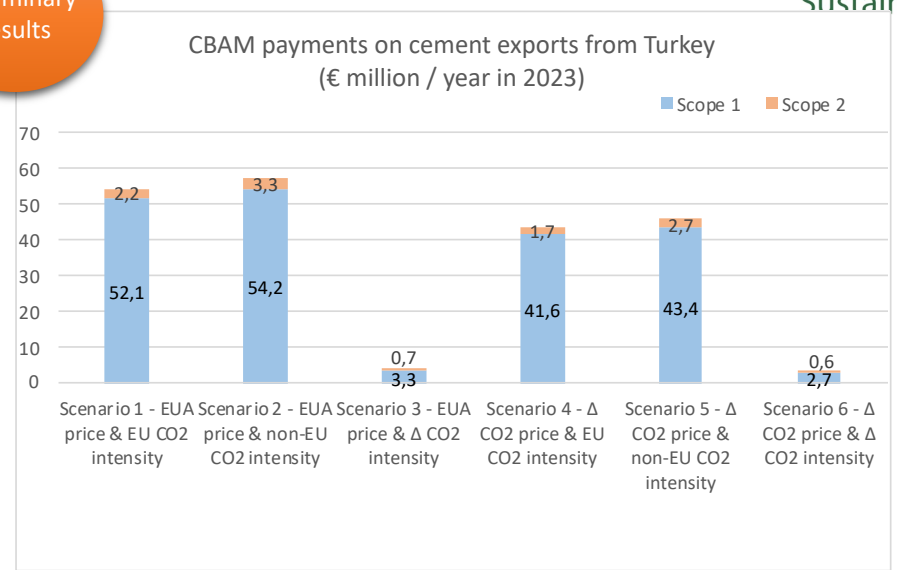
# Cement

		CO2 intensity - tCO2/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

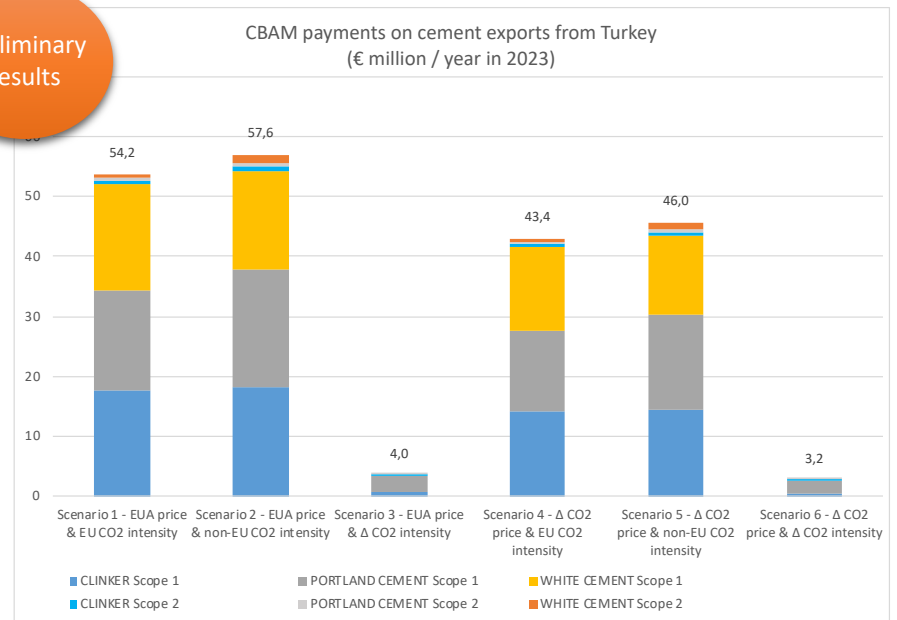
### Notes:

- 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'

Preliminary results



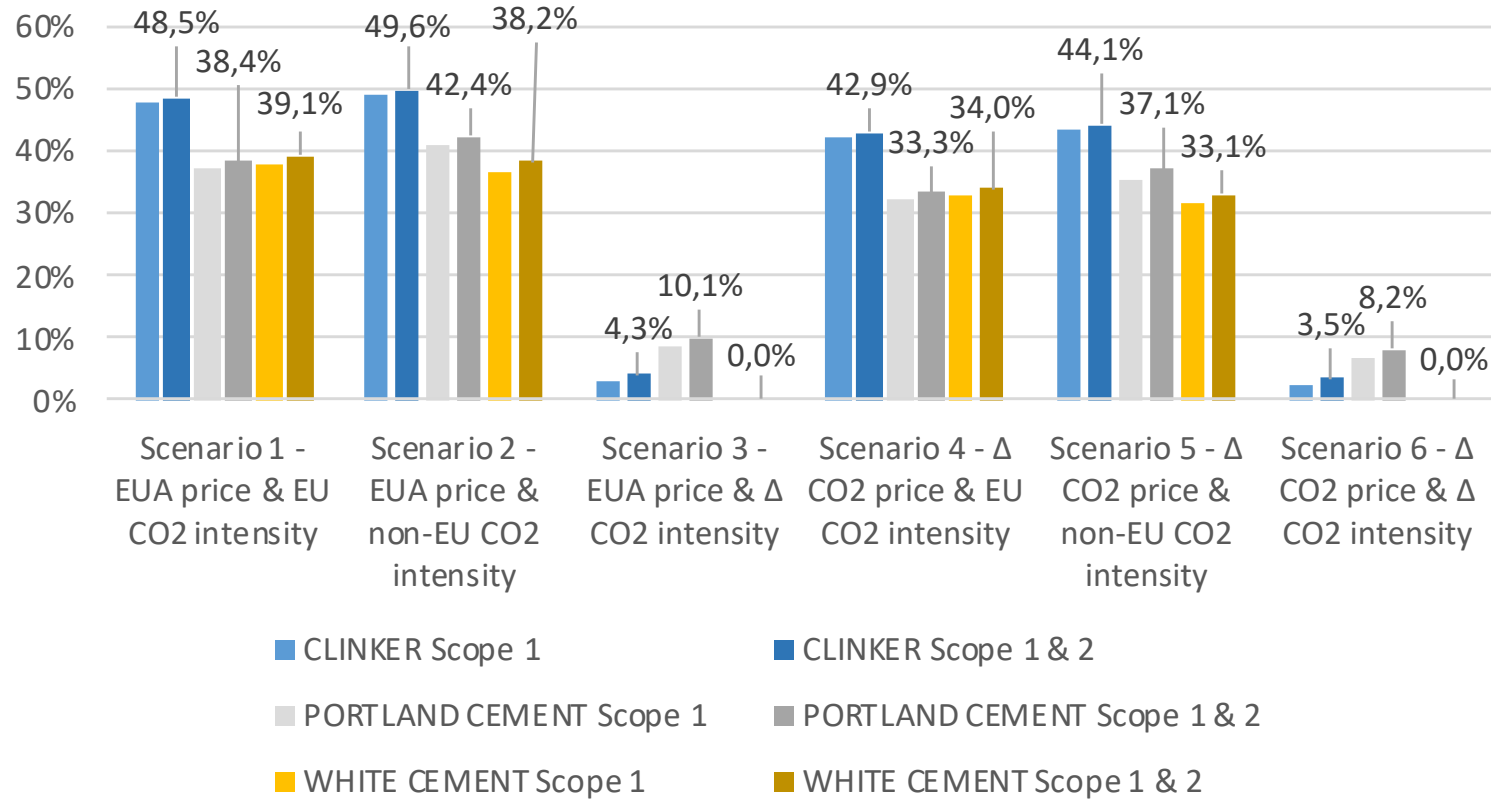
Preliminary results



## Cement – CBAM payment/current prices

Preliminary results

Competitiveness loss, cement exports from Turkey  
(CBAM payment /current prices )





## CO2 intensity - tCO2/ton of crude steel

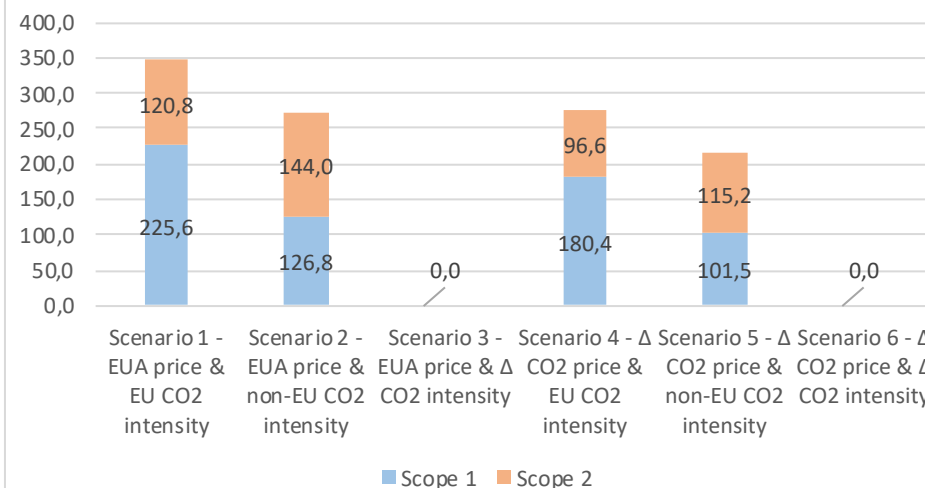
	Scope 1 emissions	Scope 1 & 2 emissions
<b>EU27</b>	0,71	1,09
<b>Turkey</b>	0,40	0,85

### Notes:

- CO2 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

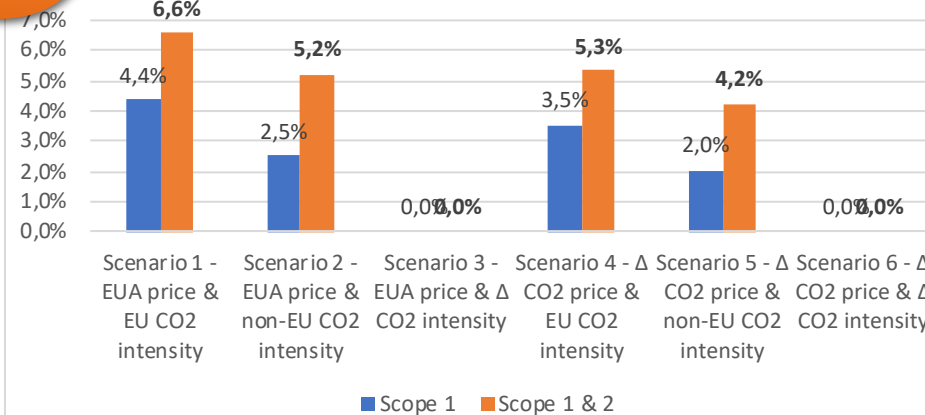
Preliminary results

### CBAM payments on steel exports from Turkey (€ million / year in 2023)



Preliminary results

### Competitiveness loss, steel exports from Turkey (CBAM payment / current prices)



# Aluminium

## CO2 intensity - tCO2/ton of primary aluminium

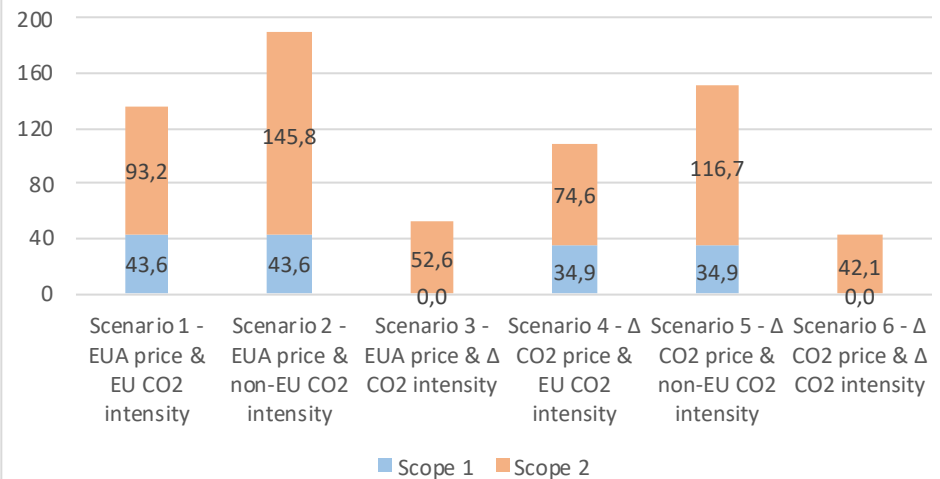
	Scope 1 emissions	Scope 1 & 2 emissions
<b>EU27</b>	2,1	6,59
<b>Turkey</b>	2,1	9,12

### Notes:

- Scope 1 intensity
  - Covers CO2 and non-CO2 emissions from: Anode/Paste, electrolysis.
  - 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

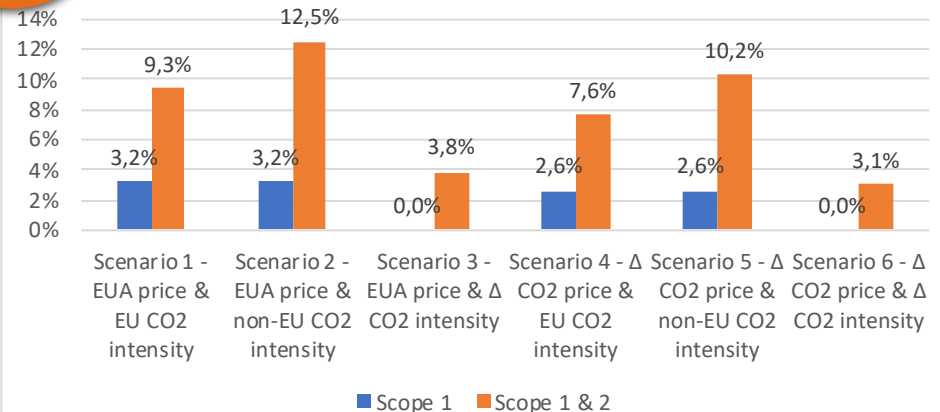
Preliminary results

CBAM payments on aluminium exports from Turkey  
(€ million / year in 2023)



Preliminary results

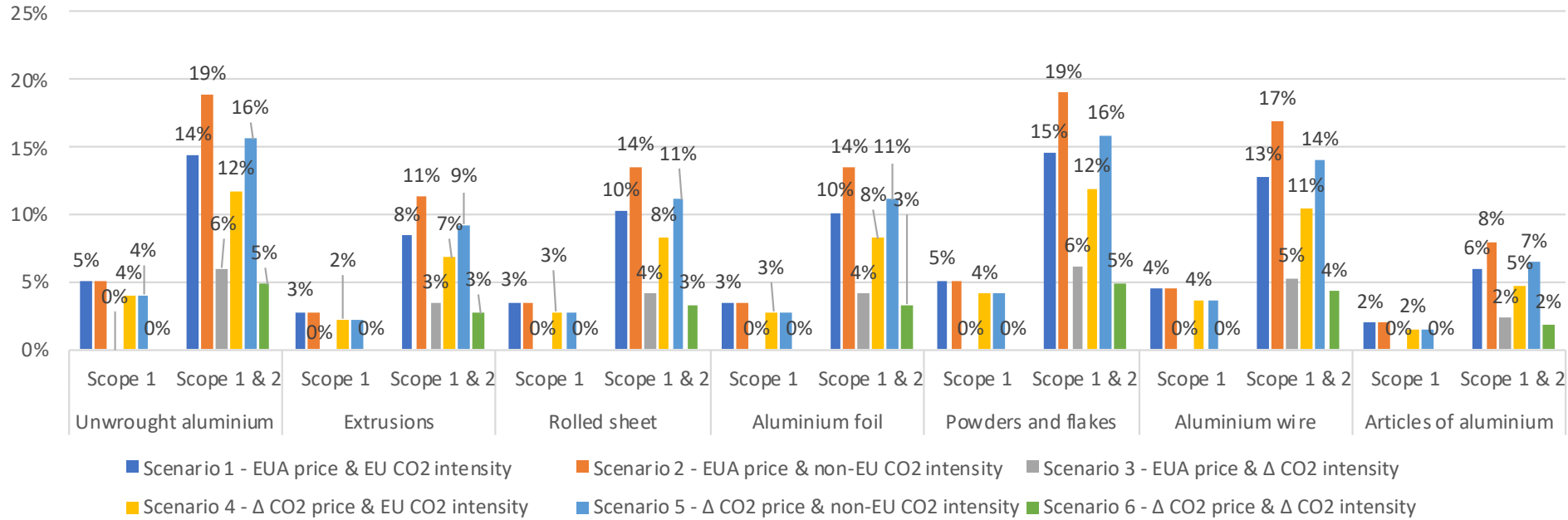
Competitiveness loss, aluminium exports from Turkey  
(CBAM payment /current prices)



# Aluminium

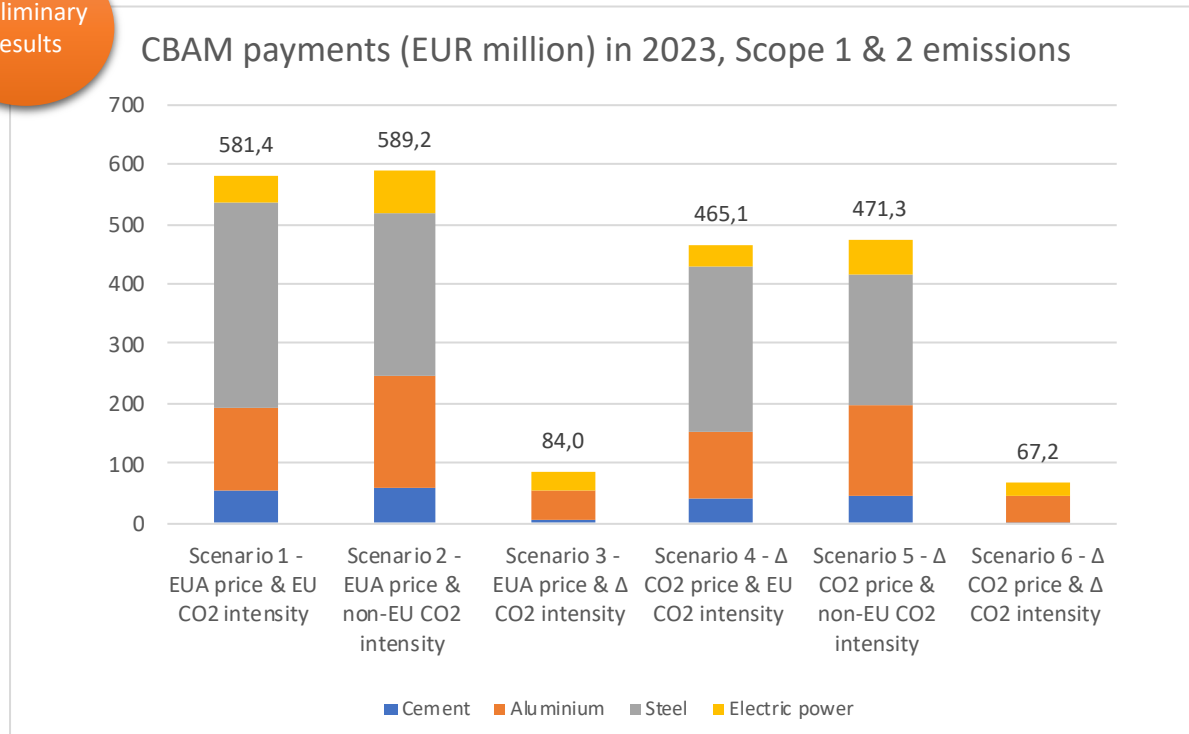
Preliminary results

Competitiveness loss, aluminium exports from Turkey  
(CBAM payment /current prices)



## CBAM payments in 2023 - total

Preliminary results



- CBAM “bill” at the border of EUR 589,2 million in 2023 million (Scenario 2; Scope 1 & 2 emissions);
- About 0,07% of Turkey’s GDP forecast in 2023.

# Key observations (1)

- 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 589 million in 2023 million (Scenario 2; Scope 1 & 2 emissions); CBAM payments would represent 0,07% of Turkey’s GDP forecast in 2023.
- CBAM payments can represent a significant share of current prices for some products
  - e.g. up to about 50% for cement, 12% aluminium, 5-6% for steel
  - Differentiated by product type. The higher in the value chain the lower the share e.g. up to 19% for unwrought aluminium, but up to 8% for articles of aluminium.
- CBAM diversified impacts depending on adopted design, e.g. product scope, emissions scope, emissions intensity

## Key observations (2)

- Product scope:
  - Several unknowns on product scope.
  - Steel & aluminium: Analysis assumes that a CBAM would apply to imports of raw materials (e.g. primary aluminium, crude steel), as well as 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 CO2 intensity values (EU or foreign, etc) has a significant impact on costs:
  - Exporting country CO2 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/tCO2) has an important bearing on the magnitude of the impact: calculations based on CO2 price forecast for 2023 EUR 50/tCO2; Since May 2021 EU ETS prices > EUR 50tCO2; Carbon pricing in exporting countries to likely be deducted from the payable level of adjustment ( $\Delta$ CO2 price), reducing CBAM burden.



**Thank you!**

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# Appendix

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

SECTOR	CODE	PRODUCT	Exports quantity (tons or GWh)	Exports value (EUR)
<b>Cement</b>	<b>HS 252310, HS 252329, HS 252321</b>	<b>Clinker, portland and white cement</b>	<b>1.295.797 tons</b>	<b>76.325.291</b>
	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
<b>Aluminium</b>	<b>HS 7601, 7603-7616</b>	<b>Aluminium trade under HS chapter 76 excluding scrap (HS 7602)</b>	<b>415.568 tons</b>	<b>1.328.971.910</b>
	7601	Unwrought aluminium	35.693 tons	70.215.182
	HS 7604, 7408, 7409	Extrusions	106.084 tons	379.669.799
	HS 7606, 7610	Rolled sheet	150.073 tons	434.489.652
	HS7607	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
	HS 7611, 7612, 7613, 7614, 7615, 7616	Articles of aluminium	40.241 tons	210.274.206
<b>Iron and steel</b>	<b>HS 7205-7217 and HS 73</b>	<b>Iron and steel (excl. pig iron, ferro-alloys, ferrous products obtained by direct reduction of iron, ferrous waste and scrap, stainless steel and other alloys) and articles thereof</b>	<b>6.375.308 tons</b>	<b>4.924.869.582</b>
	HS 7205-7217	Iron and steel (excl. pig iron, ferro-alloys, ferrous products obtained by direct reduction of iron, ferrous waste and scrap, stainless steel and other alloys)	4.805.893 tons	2.581.879.998
	HS 73	Articles of iron and steel	1.569.415 tons	2.342.989.584
<b>Electricity</b>	<b>SIEC E7000</b>	<b>Electric power</b>	<b>3.028 GWh</b>	<b>n/a</b>

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]'