

IMPACT ANALYSIS STUDY FOR THE FIVE SECTORS TO BE SUBJECT TO CARBON TAX ON EXPORTS TO THE EUROPEAN UNION

-FRAMEWORK-

I. BACKGROUND

The "European Green Deal" presented by the European Union (EU) Commission in 2019 has set itself a binding vision of making the European Continent a carbon-neutral continent by 2050. One of the tools to be used in realizing this vision is the "Carbon Border Adjustment Mechanism" (CBAM), which aims to impose additional financial burdens depending on the amount of greenhouse gas emissions generated in the production of imported products.

Within the framework of the "Fit for 55 Package" published by the EU Commission in 2021, it is foreseen that the CBAM will be launched as an emission reporting obligation for the five carbon-intensive sectors (cement, electricity generation, fertilizer, iron and steel and aluminum) starting from 2023, and then in 2026, taxation will be implemented based on the aforementioned reporting system.

The recent overall upward trend in the carbon price, formed within the scope of the EU Emissions Trading System (ETS) and to be taken as the basis for taxation, has indicated that the carbon tax rates corresponding to the amount of emissions released in the production processes may reach significant levels¹. For example, it is estimated that a manufacturer that emits 20% more than the threshold amount determined by the EU for the cement sector may incur a carbon tax of US\$ 9/ton on a per ton cement price of US\$ 42/ton as of March 2022 (based on the carbon price of EUR 80 per ton).

It is estimated that the aforementioned carbon tax may cause manufacturers that export to EU countries and do not (or cannot) switch to low-carbon production methods and technologies to encounter a significant competitive disadvantage against the manufacturers who have achieved this transition and to lose the market.

According to the data of the Ministry of Trade, as of 2021, approximately 42% of Turkey's total exports have been made to EU countries. Looking at the five exporting sectors that will be subject to carbon tax in 2026, it is seen that approximately 50% of the iron-steel and aluminum production, 20% of the cement production, 6-7% of the fertilizer production and 1% of the electricity production are exported. Again, according to the data of the Ministry of Trade, in 2020, 32% of the iron- steel exports, 53% of the aluminum exports, 11% of the cement exports, 23% of the fertilizer exports and 84% of the electricity exports were made to EU countries.

The data indicate that CBAM may have significant impacts on Turkey's manufacturing industry and therefore on the financial system also in the first stage covering limited number of sectors starting from 2026. In this respect, understanding and monitoring these risks with a prudent and medium-long-term perspective, estimating their possible effects and taking the necessary measures are of importance for the soundness of both individual financial institutions and the financial system as a whole.

As a matter of fact, within the scope of both the recommendations of the Basel Committee on Banking Supervision (BCBS) and the studies of the Financial Stability Board (FSB) formed by the G20, it is anticipated that the risks related to climate change will be closely monitored, managed and supervised, and efforts in this direction have gained momentum.

1 The carbon price per ton, which was around EUR 33 at the end of 2020, increased to EUR 97 as of February 2022, and decreased to around EUR 80 as of mid-March 2022 due to the recent instabilities in Eastern Europe (EMBER: Carbon Price Viewer <https://ember-climate.org/data/carbon-price-viewer/>)

II. PURPOSE

The primary purpose of this study is **to reveal the potential effects of the implementation of carbon tax on imports, which will be initiated by the EU in 2026 for the five carbon-intensive sectors, on the loan portfolio of the Turkish banking sector.** The secondary purpose of the study is **to increase awareness and encourage institutional capacity building in the banking sector, for understanding, monitoring, analyzing and managing climate-related financial risks.**

III. SCOPE

The study covers the balances of cash loans extended by banks operating in Turkey **to customers exporting cement, electricity, fertilizer, iron-steel and aluminum to EU countries as of the end of December 2021.** Besides these sectors, CBAM is likely to have impacts on other sectors due to back-and-forth links, but in this study only five sectors that will be directly exposed to the carbon tax implementation are included.

The Customs Tariff Statistics Position (GTIP) codes of the products that will be subject to carbon tax in export and the main activity codes corresponding to these codes (Statistical Classification of Economic Activities in the European Community - NACE) are presented in Table 1. **While it is essential to use 6-digit NACE codes to determine the main activity codes to be analyzed, 4-digit NACE codes may also be used, if this detail is not available.**

TABLE 1: Products and Business Lines to be Subject to CBAM as of 2026

Sector	GTIP codes of Taxable Products (*)	NACE / Main Activity Codes (**)	
Cement	<ul style="list-style-type: none"> • 2523.10 • 2523.21 • 2523.29 • 2523.90 	<ul style="list-style-type: none"> • 2351.11 • 2351.12 	
Electricity	<ul style="list-style-type: none"> • 2716.00 	<ul style="list-style-type: none"> • 3511.10 	
Fertilizer	<ul style="list-style-type: none"> • 2808.00 • 2814 • 2834.21 • 3102 • 3105 	<ul style="list-style-type: none"> • 2015.10 • 2015.76 • 2015.31 • 2015.32 • 2015.33 • 2015.34 • 2015.35 • 2015.39 • 2015.60 • 2015.76 	
Iron-Steel	<ul style="list-style-type: none"> • 72 • 7301 • 7302 • 7303.00 • 7304 • 7305 • 7306 • 7307 • 7308 • 7309 • 7310 • 7311 	<ul style="list-style-type: none"> • 2410.11 • 2410.12 • 2410.13 • 2410.14 • 2410.21 • 2410.22 • 2410.23 • 2410.31 • 2410.32 • 2410.33 • 2410.34 • 2410.35 • 2410.36 • 2410.41 • 2410.42 	<ul style="list-style-type: none"> • 2420.14 • 2420.21 • 2420.22 • 2420.23 • 2420.24 • 2420.31 • 2420.32 • 2420.33 • 2420.34 • 2420.35 • 2420.40 • 2431.10 • 2431.20 • 2431.30 • 2432.10

		<ul style="list-style-type: none"> • 2410.43 • 2410.51 • 2410.52 • 2410.53 • 2410.54 • 2410.55 • 2410.61 • 2410.62 • 2410.63 • 2410.64 • 2410.65 • 2410.66 • 2410.67 • 2410.71 • 2410.72 • 2410.73 • 2410.74 • 2410.75 • 2420.11 • 2420.12 • 2420.13 	<ul style="list-style-type: none"> • 2432.20 • 2433.11 • 2433.12 • 2433.20 • 2433.30 • 2434.11 • 2434.12 • 2434.13 • 2451.20 • 2451.30 • 2452.30 • 2511.21 • 2511.22 • 2511.23 • 2512.10 • 2529.11 • 2529.12 • 2591.11 • 2591.12 • 2592.11
Aluminum	<ul style="list-style-type: none"> • 7601 • 7603 • 7604 • 7605 • 7606 • 7607 • 7608 • 7609 	<ul style="list-style-type: none"> • 2442.11 • 2442.21 • 2442.22 • 2442.23 • 2442.24 • 2442.25 • 2442.26 	

Source:

(*) The European Commission: "Proposal for a Regulation of the European Parliament and of the Council Establishing a Carbon Border Adjustment Mechanism," Brussel 14/07/2021 2021/0214(COD), Annex I, p.1-3
https://eur-lex.europa.eu/resource.html?uri=cellar:a95a4441-e558-11eb-a1a5-01aa75ed71a1.0001.02/DOC_2&format=PDF

(**) Union of Chambers and Commodity Exchanges of Turkey (TOBB): Industry Database (Product Search with GTIP Codes)
https://sanayi.tobb.org.tr/kod_bulma_qtip.php

IV. METHODOLOGY

Within the scope of the impact analysis, **basically the loan repayment capacities of customers, for 2026 and beyond, will be estimated** based on their current financial situation, and taking into account **(1) the weight of their exports to the EU within the financial structure, (2) current carbon emission status, (3) prospective projects and investments (if any) to reduce carbon emissions, and (4) all other factors and developments, investment strategies, risks and opportunities that may affect the financial structure of the customer in the short and medium term.**

It is envisaged that the study will consist of three stages: (1) identifying loan customers to be assessed, (2) assessment, and (3) aggregating and conveying findings and estimations.

Stage 1 – Identifying Loan Customers to be assessed

- **Loan customers operating in the cement, electricity, fertilizer, iron-steel and aluminum industries** should be identified separately for each sectors based on the 6-digit NACE/main activity

codes in Table 1. If 6-digit codes are not available, 4-digit NACE/main activity codes may also be used.

- Among the loan customers in question, **(1) customers exporting to EU countries and (2) the share of exports to the EU in total income or turnover for each customer should be identified.** If the information and data available to the bank are not sufficient to make these determinations, it is necessary to contact the loan customers directly to obtain additional information and data. If **there are many loan customers** in the relevant sector, **"the largest loan customers with a total loan balance of at least 70%" should be contacted and customers exporting to the EU and the share in exports to the EU within their income/turnover will be included in this sample.**

Stage 2 - Assessment

- It is expected that the assessment will be carried out with the information and data already available at the bank, as well as **additional data, information and evaluations to be obtained by contacting loan customers if necessary.**
- It is expected that the assessment will basically be carried out by estimating **the degree of carbon tax impact on loan repayment capacities of loan customers**, taking into account **(1) their current financial status and (2) their carbon tax exposure potential**, within the framework of the five scales below.
- In evaluating the current financial status of the loan customer, the following must be taken into consideration as a minimum:
 - ✓ The equivalent degree of the evaluation carried out by the bank regarding the financial status of the loan customer in the following five-scale:
 - (1) Very strong financial structure
 - (2) Good financial structure
 - (3) At risk in the medium and short term
 - (4) At great risk in the short term
 - (5) In default,
 - ✓ Level of dependency of the loan customer on EU export revenues/market (the share of exports to EU countries in total revenues or turnover),
 - ✓ In case of loss in the EU market, whether this loss can be compensated by other (foreign or domestic) markets opportunities,
 - ✓ Financial strength and possible support of the group to which the loan customer belongs,
 - ✓ All other factors and developments, investment strategies, risks and opportunities, etc., that may affect the financial structure of the loan customer in the short and medium term.
- In assessing the potential of the loan customer to be affected by the carbon tax, the following must be taken into consideration as a minimum
 - ✓ Whether there are verified greenhouse gas emission (Scope 1: direct emissions) data which are accessible,
 - ✓ In case emission data are available, whether the amount of emission per production (Scope 1: direct emissions) exceeds the threshold values in the EU Green Taxonomy (Table 2), and if exceeds, to what extent,

- ✓ Whether the production process is carried out with traditional (carbon-intensive) methods and technologies (ie. Is there any indication or information to the contrary?),
- ✓ Whether there is a concrete (started or projected) investment or plan that will significantly reduce greenhouse gas emissions in production in the next three years (for example, introduction of a new technology, changing/improving the production procedure, using alternative inputs, increasing energy efficiency, switching to renewable energy sources),
- ✓ In case there is a substantial investment or plan, the level of its contribution (for example, a relative reduction in emissions or full compliance with EU standards).

TABLE 2: Threshold Values determined by the EU for the Products subject to Carbon Tax

Sector	Threshold Values for Exemption from Carbon Tax
Cement	<p><u>Facilities Manufacturing Clinker Only:</u> Emissions per ton of clinker manufacturing should be below 0.766 tons of CO₂.</p> <p><u>Cement Manufacturing Facilities:</u> Emissions per ton of cement manufacturing should be below 0.498 tons of CO₂.</p>
Aluminum	<p><u>Primary Aluminum Production:</u> Emissions per ton of aluminum production must be equal to or less than 1.514 tons of CO₂, plus at least one of the following two conditions must be met</p> <ul style="list-style-type: none"> ✓ Electricity used per ton for electrolysis is equal to or less than 15.29 MWh or ✓ Emissions per kilowatt hour of electricity used for primary aluminum production (electrolysis) must be equal to or less than 100 grams of CO₂. <p><u>Secondary Aluminum Production:</u> There are no additional criteria for secondary aluminum production (e.g. production from recycled aluminum). This production is considered green and is not subject to carbon tax.</p>
Iron-Steel	<ul style="list-style-type: none"> ✓ Emissions per ton for hot metal should be below 1.328 tons of CO₂, ✓ Emission per ton for sintered ore should be below 0.171 tons of CO₂, ✓ Emission per ton for iron casting should be below 0.325 tons of CO₂, ✓ Emissions per ton for electric arc furnace (EAF) high alloy steel should be below 0.352 tons of CO₂, ✓ Emissions per ton for electric arc furnace (EAF) carbon steel should be below 0.283 tons of CO₂, ✓ Emissions per ton for coking coal (excluding lignite coke) should below 0.286 tons of CO₂. <p>All green new steel production, or combination of new and recycled steel production, is eligible if the emissions fall below the thresholds above.</p> <p>Additionally, all production of steel in EAF where at least 90% of the iron content in the final products is sourced from scrap steel is considered eligible. In this case, no other thresholds are applicable.</p>
Fertilizer	<p><u>Nitric Acid Production:</u> Emissions per ton of production should be below 0.302 tons of CO₂.</p> <p><u>Ammonia Production:</u> Both of the following conditions must be met</p> <ul style="list-style-type: none"> ✓ Scope 1 emissions per ton must be below 1 ton of CO₂ and ✓ Emissions per ton (Scope 1 and Scope 2 (resulting from electricity consumed)) must be below 1.3 tons of CO₂.

	For the calculation of the emissions from the manufacturing process of ammonia, both the steps: production of the intermediate product hydrogen and synthesis of the ammonia are considered. Scope 1 emissions include both emissions.
Electricity	Production based on renewable energy (solar, wind, hydroelectric, biomass) is considered compatible. For 1 kWh of electricity generation, the emission must be equal to or less than 100 grams of CO2 .

Source: EU Sustainable Finance Technical Expert Group Taxonomy Report: Technical Annex

https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy-annexes_en.pdf

- Within the scope of the assessment, **it is expected to estimate the future loan repayment capacity, taking into account the current position in the scale reflecting the financial status of the loan customer and customer's potential to be affected by carbon tax.** For example:
 - ✓ **The customers that do not have carbon emission data or accessible data, a convincing indication of producing with low emissions, a concrete (initiated or projected) investment for reducing emissions will be assumed as "high emission customer".** In this case, if there are no other resources or opportunities to support loan repayment capacity in the medium and long term, current financial status should be expected to deteriorate by 1, 2, 3 or 4 levels, depending on the weight of EU exports in the customer's financial structure.
 - ✓ Assuming it would be negligibly affected by carbon tax, the loan repayment capacity of customers who are considered (or assumed to be) "high emissions customer" but for which the weight of EU exports in their financial structure is very low (i.e. 5% or less) can be preserved as is.
 - ✓ Assuming it would be significantly affected by carbon tax, the loan repayment capacity of customers who are considered (or assumed to be) "high emissions customer" and for which the weight of EU exports in their financial structure is important (i.e. around 25%) should deteriorate by 1 or 2 levels.
 - ✓ Assuming it would not be affected, or would be slightly affected, by carbon tax thanks to the presence of a concrete (initiated or projected) investment that will significantly reduce carbon emissions in the near term, the loan repayment capacity of customers who are currently considered "high emissions customer" and for which the weight of EU exports in their financial structure is important (i.e. around 20%) may remain at the same level or deteriorate by 1 level.
 - ✓ Loan repayment capacity of the customers, for which the relevant information, statements or indications (i.e. verified emission data, compliance with international emission standards, document-based company statements) are showing they are currently operating with low carbon emissions, may be preserved as is.
 - ✓ Among the customers operating in the aluminum industry, only the primary (ore) producers are subject to carbon tax based on the threshold values specified in Table 2, and **secondary (recycled aluminum) production is not subject to carbon tax. For that reason, the loan repayment capacity of customers that "only produce secondary aluminum" will be preserved.**
- The matrices or algorithms may be developed by the banks to simplify the assessment process through which they estimate the customers' prospective loan repayment capacity, taking into account the relevant parameters such as weight of EU exports, presence of emission reducing projects, as in the example given below:

TABLE 3: Loan Repayment Capacity Deterioration Matrix (Number of Levels*)

Share of EU Exports in Total Revenue or Turnover (X%)	Those Currently Using Conventional (High Carbon Emissions) Methods and Technologies			Those Currently Using Methods and Technologies in Compliance With the EU Standards
	Concrete Investments or Plans for reducing Carbon Emission (Initiated or Projected)			
	None	Partial Reduction/Improvement	Full Compliance with EU Standards	
0 < X ≤ 5	0	0	0	0
5 < X ≤ 15	1	0	0	0
15 < X ≤ 25	2	1	0	0
25 < X ≤ 50	3	2	0	0
50 < X ≤ 100	4	3	0	0

(*) The number of levels denotes the severity of the assumed deterioration on the customers' current financial status due to the carbon tax. For example, "2" means that a customer that is currently in the category of "1- Very strong financial structure" moves to "3- At risk in the medium and short term".

- The methodology outlined above shows the simplest approach that can be used in this study. **Provided that the details are explained, it is also possible for banks to develop and use methods and approaches that are more appropriate and more sophisticated, including different parameters.**

Stage 3 – Aggregating and conveying findings and estimations

- It is expected that the basic data, findings and estimations obtained within the scope of the study will be aggregated and conveyed to the Agency through summary tables in the Excel file named "Statement File", which is presented in Table 4 for each sector. In this context:
 - ✓ **All loan customers (including non-exporters) operating in each sector**, by their total customer numbers, current loan balance, and loan repayment capacity (financial status level) (Table 4-A),
 - ✓ **EU exporter loan customers** assessed in the study, by their total customer numbers, current loan balance and loan repayment capacity (financial status levels) (Table 4-B),
 - ✓ **Emission findings for EU exporter loan customers** evaluated (Table 4-C),
 - ✓ **Estimations regarding the loan repayment capacities of EU exporter loan customers for the year 2026 and beyond** (Table 4-D),
 should be aggregated and reported through relevant tables in the Excel File.
- In addition to the Excel file, **a detailed explanation document** (Word file) is to be prepared, **which includes the basic approach, assumptions, methods and tools used in the evaluation, and the limitations and problems encountered, as much as possible.**
- The prepared Excel and Word files must be sent to the Agency via the **Rapid Information Transfer System (HBAS) until the end of working hours on Monday, May 9, 2022.**
- For any questions regarding the study, the Agency can be contacted via bmesutoglu@bddk.org.tr or phone (212) 214 51 83.

TABLE 4: Assessment Summary Tables

..... SECTOR	Number of customers as of December 2021	Total receivable balance as of December 2021 (thousand TL)
A- All loan customers whose main activities are (Current Status)		
1- A very strong financial structure		
2- A good financial structure		
3- At risk in the medium and short term		
4- At great risk in the short term		
5- Currently in default		
Total	0	0
B- Current Financial Status of Loan Customers Exporting to the EU (Assessed)		
1- A very strong financial structure		
2- A good financial structure		
3- At risk in the medium and short term		
4- At great risk in the short term		
5- Currently in default		
Total	0	0
C- Emission Findings for the Assessed Loan Customers Exporting to the EU		
Customers having emission data	0	0
- Customers whose emission data is accessible by your bank		
- Customers whose emission data is not accessible by your bank		
Customers having Emissions Data (By Compliance with EU Standards)	0	0
- Customers that can be determined to operate with low emissions in EU Standards		
-Customers that cannot be determined to operate with low emissions in EU Standards		
Customers that currently produce/assumed to produce using traditional (carbon-intensive) methods and technologies (customers with no evidence to the contrary or no emission data available/not accessible)	0	0
- -Customers with a concrete (initiated or projected) investment or plan to reduce carbon emissions in the near term		
- -Customers with no concrete investments or plans to reduce carbon emissions		
D- Forecast of Financial Status of the Loan Customers exporting to the EU after Carbon Tax		
1- Expected to continue its very strong financial structure		
2-Expected to continue its good financial structure		
3- Financial structure is expected to be at risk in the medium and short term		
4- Financial structure is expected to be at great risk in the short term		
5- In default or expected to be in default		
Total	0	0