CBAM and Budgetary Revenue

Prospects for the EU and Poland

#LIFEENSPIRE

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AUTHORS AND COPYRIGHT

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List of abbrevations

CBAM	Carbon Border Adjustment Mechanism
EC	European Commission
EU	European Union
EU ETS	EU Emission Trading System
GHG	Greenhouse Gas
IOŚ-PIB	Institute of Environmental Protection - National Research Institute
KOBiZE	National Centre for Emissions Management
CAKE	Centre for Climate and Energy Analyses
MFF	Multiannual Financial Framework
GNI	Gross National Income
EFTA	European Free Trade Association
CN codes	Combined Nomenclature codes
CPA	Classification of Products by Activity
GECO	Global Energy and Climate Outlook
GTAP	Global Trade Analysis Project
RGGI	Regional Greenhouse Gas Initiative
ICE	Intercontinental Exchange
NECP	National Energy and Climate Plan
EUR/t CO_2	Euro per tonne of CO_2

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Main conclusions

- **Dual role of CBAM:** it helps address carbon leakage and supports global decarbonisation, while also becoming a new source of revenue for the EU and Member States (**75% allocated to the EU budget**).
- **Revenue potential:**
  - CBAM can become a significant EU own resource, but its revenue potential falls sharply if global carbon prices converge with the EU ETS.
  - Extending CBAM coverage (horizontally and vertically) could almost triple revenues, but also could raises administrative and political complexity.
  - For the European Union, revenues are estimated at **EUR 5-9 bln in 2030** and **EUR 6-22 bln in 2035** under the current scope, compared with **EUR 16-31 bln** and **EUR 20-75 bln** under an extended scope.
  - For **Poland**, the ranges are **EUR 0.4-0.8 bln (2030)** and **EUR 0.5-1.9 bln (2035)** under the current scope, versus **EUR 1.1-2.1 bln** and **EUR 1.4-5.3 bln** under an extended scope.
- **Key drivers of revenues:**
  - **Scope of coverage** - extension to additional energy-intensive and downstream products could nearly triple revenues.
  - **Foreign carbon pricing** - stronger alignment with EU ETS prices lowers CBAM revenues.
  - **Phase-out of free allocation** - by 2035 the CBAM factor reaches 100%, increasing payments.
  - **EU ETS price levels** - higher EU carbon prices translate directly into higher CBAM revenues.
- **Distributional effects:** under current coverage, steel and aluminium dominate; with extension, chemicals and refinery products take a larger share. Italy, Spain, Belgium, the Netherlands, Germany, and Poland generate the biggest shares among Member States, while China's importance as a CBAM payer grows under extended coverage.
- **Neighbouring and candidate countries:** Türkiye and Ukraine are most exposed to CBAM-related costs unless domestic carbon pricing is introduced. Candidate countries joining the EU ETS will be exempt.
- **Overall insight:** CBAM could represent a significant fiscal instrument, but its revenue potential depends on product coverage, EU ETS price developments, carbon pricing in partner countries, and administrative implementation.

Executive summary

1) Purpose and context

The European Union aims to achieve climate neutrality by 2050. To align trade policy with this objective, it has introduced the Carbon Border Adjustment Mechanism (CBAM), a key element of the "Fit for 55" package. CBAM applies EU carbon pricing to imports of selected goods, ensuring equivalent carbon costs for EU and foreign producers. Its dual objectives are to prevent carbon leakage and encourage global decarbonisation. Beyond its climate role, CBAM is also expected to generate budgetary revenues, with 75% of proceeds channelled to the EU budget as part of the Union's system of own resources.

This report estimates potential CBAM-related budgetary revenues for the Europe and Poland for 2030 and 2035, under different policy and market scenarios. It focuses on two product coverage scenarios and three foreign carbon pricing variants, providing a structured assessment of CBAM's fiscal implications and distributional patterns. This report is released ahead of the European Commission's forthcoming assessment on the possible extension of CBAM, expected by the end of 2025 under Article 30(2) of the CBAM Regulation.

The analysis presented in this report focuses on the fiscal dimension of CBAM and does not attempt a full macroeconomic or welfare assessment. It does not model behavioural responses, such as changes in trade flows, investment decisions, or ETS price feedbacks. As such, the revenue estimates should be interpreted as stylised scenarios rather than precise forecasts.

2) Analytical framework

Two product coverage scenarios are examined:

- **Reference Scenario:** limited to current CBAM product coverage - *cement, iron and steel, aluminium, fertilisers, and electricity*.
- **Extension Scenario**: includes additional energy-intensive products (e.g. *chemicals, refinery products, paper*) and selected downstream manufacturing goods (e.g. *metal products, electronics, vehicles*), as well as indirect (scope 2) emissions for *steel and aluminium*.

Three foreign carbon pricing variants are considered:

- **Status Quo**: limited and uneven carbon pricing outside the EU, based on current global carbon price levels projected forward.

- **Moderate Alignment**: foreign carbon prices reach 25% of the EU ETS level by 2030 and 50% by 2035.
- **Strong Alignment**: foreign carbon prices reach 50% by 2030 and 75% by 2035 (the United Kingdom is assumed to be fully aligned under the Moderate and Strong Alignment variants).

CBAM revenues are calculated by combining projected embedded emissions in imports with the evolving CBAM factor (rising to 100% by 2035), assumed **EU ETS allowance prices (EUR 123/tCO₂ in 2030; EUR 147/tCO₂ in 2035**, 2024 prices[1]), and foreign carbon price assumptions. Import volumes are assumed to grow in line with GDP, without explicit price elasticity, in order to isolate the impact of CBAM design parameters and foreign carbon pricing on revenues.

3) Key results

Coverage expansion is the main driver of differences in revenue levels across scenarios. Under the Reference Scenario, embedded emissions in EU imports remain around 175 Mt CO_2 in 2024, declining slightly by 2035. The Extension Scenario expands coverage to nearly 600 Mt CO_2 by including additional product groups and indirect emissions for steel and aluminium.

This significantly increases projected CBAM revenues, as shown below:

Table 1. CBAM revenues for EU and Poland in the years 2030 and 2035

	Embedded emissions (Mt CO_2) 2024 → 2035	EU revenue (EUR bln) 2030	EU revenue (EUR bln) 2035	PL revenue (EUR bln) 2030	PL revenue (EUR bln) 2035
Reference	175 → 168	5-9	6-22	0.4-0.8	0.5-1.9
Extension	587 → 569	16-31	20-75	1.1-2.1	1.4-5.3

**The range depends on the foreign carbon pricing variants*

Source: CAKE/KOBiZE

Year-to-year revenue evolution is shaped mainly by regulatory parameters and foreign policy choices, not by changing embedded emissions. Embedded emissions remain relatively stable over time, as import growth is offset by assumed improvements in emission intensities.

[1] From draft of Poland's updated National Energy and Climate Plan (NECP).

Revenue growth is driven primarily by the increase in the CBAM factor (due to the phase-out of free allocation) and EU ETS prices, while foreign effective carbon price convergence acts as a strong moderating factor. Under Strong Alignment, EU revenues in 2035 are roughly three to four times lower than under Status Quo.

4) Methodological note and limitations

The results reflect deliberate methodological choices. Uncertainty is explored mainly through foreign carbon pricing, while import dynamics and emission intensity reductions are modelled in a simplified and uniform way across products and regions. In reality, emission intensities might not decline as assumed or could depend more strongly on countries' mitigation ambitions. Likewise, EU ETS carbon prices remain a key uncertainty. These factors should be considered when interpreting the projections.

5) Implications

CBAM could become a significant new source of fiscal revenue for the EU and Member States, especially after free allowances in the EU ETS are phased out. However, the scale of future revenues depends critically on:

- the eventual scope of CBAM coverage,
- foreign effective carbon pricing trajectories,
- EU ETS carbon prices,
- the effectiveness of administrative implementation,
- low carbon technologies development around the world.

Extending CBAM coverage would substantially increase revenues and reduce carbon leakage risks but also raise administrative demands. Conversely, stronger foreign carbon pricing would reduce EU CBAM revenues while advancing global climate objectives, illustrating that CBAM's fiscal role is closely intertwined with its climate policy function.

1. The Carbon Border Adjustment Mechanism (CBAM)

1.1. Political context

Over the past decade, the European Union has positioned itself as a global leader in climate action, making climate neutrality by 2050 the cornerstone of its political and economic strategy. This transformation accelerated with the adoption of the European Green Deal in 2019, which reframed climate policy, no longer as a standalone environmental issue, but as a central pillar of EU industrial policy, trade relations, and geopolitical positioning.

A key element of this strategy is the Fit for 55 package, which sets a legally binding target to cut greenhouse gas (GHG) emissions by at least 55% by 2030 compared to 1990 levels. To achieve this, the EU launched wide-ranging reforms across its climate and energy framework, most notably to the EU Emissions Trading System (EU ETS), while also adopting new measures to reduce emissions in energy, transport, buildings, and land use.

Among the flagship instruments of this new architecture is the Carbon Border Adjustment Mechanism (CBAM). Integrated into Fit for 55, CBAM applies the EU's carbon pricing to imports to ensure that foreign and domestic producers are subject to equivalent carbon costs. Its primary objective is to prevent carbon leakage - the relocation of production to countries with weaker climate policies - while incentivising global producers to adopt cleaner technologies and climate-friendly standards.

In practice, CBAM embodies the external dimension of EU climate ambition by extending the logic of the EU ETS to international trade. Through this mechanism, the EU not only deepens its domestic climate efforts but also fosters global decarbonisation via trade policy. At the same time, CBAM safeguards the integrity of the EU ETS, supports a level playing field for European industries, and strengthens the EU's role in climate diplomacy by using regulatory ambition as a lever to influence global value chains and production models beyond its borders.

1.2. Implementation timeline

The implementation of CBAM[2] is divided into two phases:

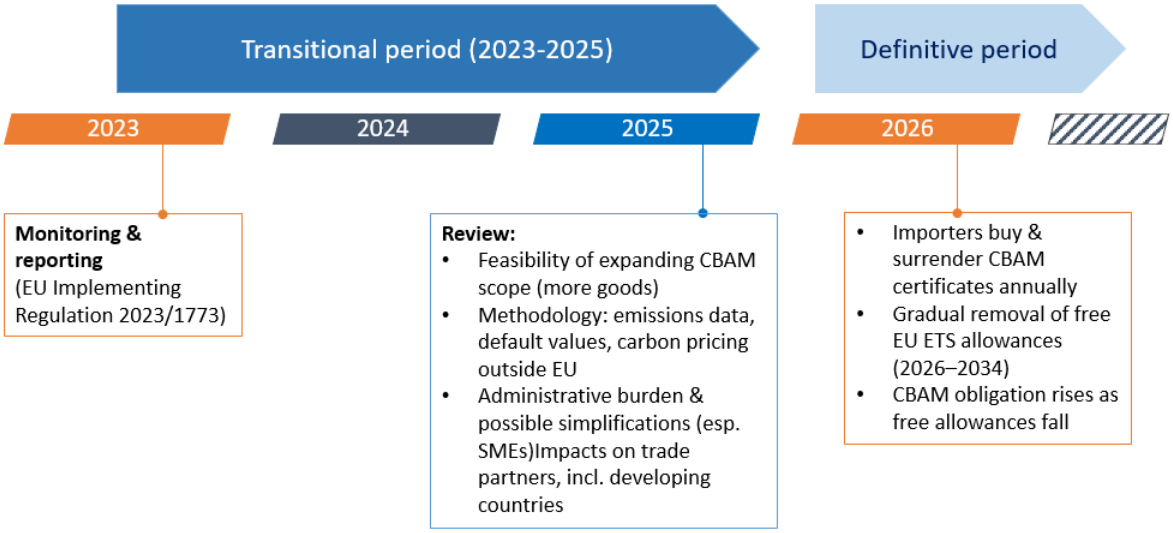
- **Transitional Phase (1 October 2023 - 31 December 2025).** This pilot period allows importers, producers, and Member States to gain practical experience, while providing the European Commission with data on embedded emissions (i.e. greenhouse gas emissions generated during the production of CBAM goods). The data will be used to refine the final methodology for emission calculation. During this phase, importers (or their indirect customs representatives) are required only to report the embedded emissions of imported

[2] Commission Implementing Regulation (EU) 2023/1773 of 17 August 2023 laying down the rules for the application of Regulation (EU) 2023/956 of the European Parliament and of the Council as regards reporting obligations for the purposes of the carbon border adjustment mechanism during the transitional period (OJ L 228 15.9.2023, p. 94)

goods, without the obligation to surrender CBAM certificates or make financial payments[3]. If a report is missing, incorrect, or incomplete, the competent national authority may request corrections. Where deficiencies remain, an administrative penalty may be imposed (ranging from EUR 10 to EUR 50 per tonne of unreported emissions, depending on the quantity concerned).

- **Definitive Phase (from 1 January 2026).** Importers will be required to obtain the status of *Authorised CBAM Declarant* in order to continue importing CBAM goods. They must submit annual CBAM reports on embedded emissions and purchase CBAM certificates corresponding to the volume of emissions embedded in their imports. The certificate price will be determined by the weekly average auction price of EU ETS allowances. In this phase, importers will therefore assume face financial obligations linked to the carbon content of their imported products.

Figure 1. CBAM implementation timeline



Source: European Commission, 2023

[3] In principle, CBAM reporting requires the collection of data on actual embedded emissions, determined in accordance with the methodology established by the European Commission. Exceptionally, during the first year of implementation, reporting could also be based on methodologies defined under equivalent national systems of third countries (subject to specific conditions), or on reference values (default values). Default values may also be used where the reporting declarant is unable to obtain actual emissions data despite having taken all necessary steps.

1.3. CBAM in the EU Own Resources Framework

The European Union is entering a period of mounting fiscal and strategic challenges. The increasing demands for competitiveness, defence, security and resilience, together with the urgent need to accelerate the green and digital transitions, have placed unprecedented pressure on the EU budget. At the same time, the Union must begin repaying loans taken out under Next Generation EU without making disproportionate cuts to programmes or increasing Member States Gross National Income (GNI) contributions excessively. While stable, the existing financing system relies heavily on national contributions, which have reached their structural limits as the Union's ambitions grow.

To address these pressures, the European Commission's proposal for the 2028-2034 Multiannual Financial Framework (MFF), due in July 2025, introduces a new generation of own resources designed to diversify the EU's revenue base. These mechanisms aim to secure sustainable financing for shared priorities and reinforce the EU's financial autonomy. Of the five proposed new own resources, two climate-linked instruments, i.e. the EU Emissions Trading System (EU ETS) and the Carbon Border Adjustment Mechanism (CBAM), stand out as central pillars of this reform. They embody the Union's dual objectives of reducing greenhouse gas emissions and ensuring fiscal sustainability in the post-Next Generation EU era.

The ETS-based own resource is built on revenues from the auctioning of carbon emission allowances under the established ETS1. Under the proposal, 30% of these revenues will be channelled directly to the EU budget, while the remaining share will be retained by Member States. To preserve stability and administrative simplicity, the Commission deliberately excluded the newly created ETS2, which will cover buildings and road transport. From 2028 onwards, the ETS-based own resource is expected to generate around EUR 9,6 billion each year[4], establishing it as one of the largest new revenue streams under the upcoming MFF.

Complementing the ETS, the CBAM-based own resource serves as the external counterpart to the EU's internal carbon market. The majority of CBAM revenues, amounting to 75%, will be allocated to the EU budget, while national authorities will retain the remainder 25%. Starting in 2028, CBAM revenues, with possible scope extension, are projected by the European Commission to reach around EUR 1,4 billion per year[5]. However, the dual nature of CBAM, as both a climate and a fiscal instrument, raises important policy questions. Higher EU ETS and CBAM prices increase revenues, but they also amplify distributional impacts and competitiveness concerns. Conversely, if trading partners introduce robust domestic carbon pricing and align with the EU ETS, CBAM revenues decline, while the global climate outcome improves. This inherent tension is central to the interpretation of the revenue estimates presented in this report.

[4] https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/eu-budget-2028-2034_en
[5] https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/eu-budget-2028-2034_en

1.4. Product coverage

In its current form, the CBAM covers the following product groups:

- cement,
- iron and steel,
- aluminium,
- fertilisers,
- electricity,
- hydrogen.

These products were selected because they originate from sectors with high energy intensity and significant greenhouse gas emissions. In non-EU countries with coal-based energy systems, their production is typically associated with particularly high embedded CO_2 emissions. In addition, these sectors present a high risk of carbon leakage, i.e. the relocation of production to jurisdictions with less stringent climate policies.

The CBAM framework distinguishes between direct emissions (scope 1), which result from fuel combustion and industrial processes at producers' facilities, and indirect emissions (scope 2), which arise from the generation of electricity consumed during production. Under the current regulation, indirect emissions are covered only for cement and fertilisers. For other CBAM-covered products (aluminium, iron and steel), indirect emissions are not included, as these sectors are eligible for state aid under the EU ETS to compensate for indirect costs. This ensures consistency with existing EU compensation mechanisms.

According to Article 30(2) of the CBAM Regulation, the European Commission must submit a report by the end of 2025 assessing the feasibility of extending CBAM. This assessment will consider possible horizontal (to additional product categories) and vertical (to more complex downstream goods) expansion, as well as the inclusion of transport-related emissions.

Depending on the outcome of this assessment, a future extension of CBAM could involve all of these dimensions, alongside a decision on the potential inclusion of indirect emissions in the reporting framework. In principle, the most accurate approach would be to calculate emissions using real data, taking into account material composition (e.g. steel or aluminium content in fridges, engines, or electronic devices) and upstream emission factors. However, because this may not always be feasible, default values will likely be needed. This reliance on standardised values carries the risk of excessive simplification, since material content can vary considerably across products and technologies.

Another challenge concerns the potential number of processed goods affected. The Commission has indicated that up to 2,000 additional products could be brought under CBAM in the future. Expanding coverage to this scale would significantly increase administrative and compliance complexity. National competent authorities would need to

handle a much larger volume of declarations containing embedded emissions data, while importers and producers would face more demanding reporting requirements, particularly for complex downstream goods containing CBAM-covered materials in varying proportions.

This, in turn, would require the definition and regular updating of a large number of default values, as well as robust monitoring, reporting, and verification systems to maintain data quality and prevent misclassification or circumvention. On the other hand, broader product coverage would help reduce the risk of avoidance through the import of processed goods rather than basic materials.

These implementation issues are complex and warrant separate, detailed analysis. This study focuses exclusively on estimating the embedded emissions and potential budgetary revenues from CBAM, under the assumption that all operational challenges can be effectively addressed. As a result, the Extension Scenario should be viewed as an upper-bound illustration of what a significantly broadened CBAM could imply for coverage and revenues, rather than a prediction of the exact scope that will ultimately be adopted.

1.5. CBAM certificates: obligations and pricing

From 2026, CBAM will enter its full implementation phase, requiring importers to purchase and surrender CBAM certificates for all goods covered by the mechanism and imported into the EU. Each certificate corresponds to one tonne of CO_2-equivalent embedded emissions generated during the production of the imported goods. The first CBAM declaration and surrender of certificates will take place in 2027, covering goods imported in 2026.

The number of certificates that importers are required to surrender depends on three elements:

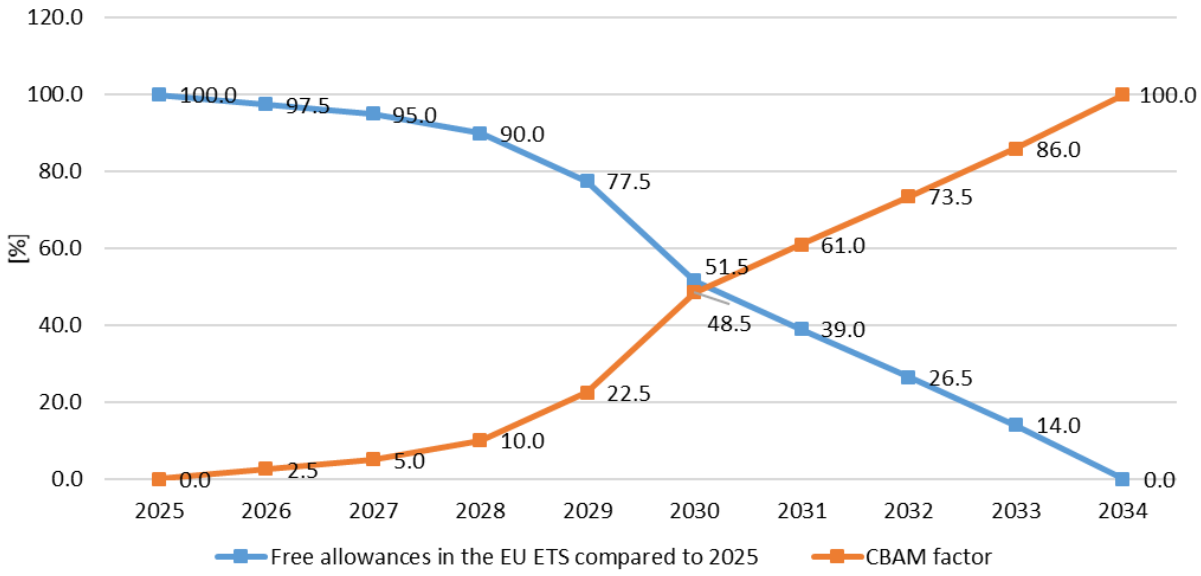
1) The embedded emissions of the imported products;
2) The CBAM factor, which determines the share of these emissions subject to CBAM obligations;
3) The extent to which a carbon price is applied in the exporting country.

The CBAM factor is intended to align CBAM with the EU ETS, under which EU installations still receive part of their allowances for free. The factor will apply from 2026 until the full phase-out of free allocation in 2034, increasing gradually from 2.5% in 2026 to 100% in 2034, in parallel with the reduction of free allocation for EU operators (**Figure 2**).

If the exporting country applies a carbon price (e.g. through an emissions trading system or carbon tax), the required number of CBAM certificates is reduced to reflect the carbon price effectively paid abroad. In line with Article 9 of the CBAM Regulation, authorised CBAM declarants may claim such a reduction to take into account the carbon price effectively paid in

the country of origin, net of any rebates or compensation. In principle, if the foreign carbon price equals the EU ETS price, no certificates need to be surrendered. For the purposes of this analysis, the number of certificates to be surrendered is calculated by taking the embedded emissions, applying the CBAM factor for the relevant year, and then reducing this amount in proportion to the ratio between the foreign carbon price and the EU ETS price (see Annex for details).

Figure 2. CBAM Factor in the years 2026-2034



Source: CAKE/KOBiZE based on Directive 2023/959

The price of CBAM certificates will be linked to the EU ETS allowance price, ensuring that the carbon cost faced by importers under CBAM is aligned with that faced by EU producers. While the CBAM Regulation initially provided that the price would reflect the average weekly clearing price of EU ETS allowances, the OMNIBUS package (European Commission, 2025) extended the averaging period. With the exception of 2026, certificate prices will now be based on the average EUA auction price during the quarter in which the emissions occurred.

In addition to uncertainty over foreign effective carbon price trajectories, there is regulatory ambiguity surrounding the conditions for CBAM crediting of those prices. The CBAM Regulation allows importers to reduce their certificate obligation if a carbon price has been "effectively paid" in the country of origin (Article 9). However, it does not (yet) define precisely which carbon-pricing schemes qualify, or whether export-only carbon pricing regimes might be accepted. In theory, a jurisdiction could impose a carbon levy solely on goods destined for the EU, while exempting domestic consumption. Whether such a scheme would be eligible for crediting is unclear, and may be viewed as an abuse or circumventing mechanism.

Other structural configurations - such as dual-pricing regimes (e.g. lower domestic carbon prices, higher export prices) or preferential treatment for exports, have been discussed in policy literature, especially in the context of "common but differentiated responsibilities" (as elaborated in Elkerbout et al. 2025). These raise complex equity and administrative issues: poorer countries may struggle to match EU-level prices domestically, but might seek crediting for export-oriented carbon pricing.

Because of this, regulatory uncertainty is not limited to foreign price levels but extends to how pricing systems will be structured and judged under CBAM. The forthcoming implementing acts, guidance, and the Commission's reports (for instance under Article 30) will likely need to provide clearer rules on acceptable schemes and anti-abuse safeguards. Until then, modellers and policymakers must recognize that assumptions about crediting design could materially affect revenue estimates and leakage outcomes.

1.6. Implications for neighbouring and candidate countries

CBAM has implications not only for EU Member States but also for neighbouring and candidate countries with close economic ties to the EU, such as Ukraine, the Western Balkans, and Türkiye.

While this section focuses on neighbouring and candidate countries, the same logic applies to other EU trading partners worldwide. The key difference is that, upon accession, candidate countries would be integrated into the EU ETS and CBAM would no longer apply to their exports. For third countries without accession prospects, however, CBAM obligations will remain a permanent feature of trade with the EU.

A key issue for neighbouring and candidate countries is the carbon price gap: the difference between projected EU carbon prices and those in their domestic jurisdictions (if present). The EU carbon price is currently around EUR 80/tCO_2 (mid-2025) and is projected to reach around EUR 123/tCO_2 by 2030[6]. Among non-EU neighbours, Montenegro currently operates a domestic emissions trading scheme with a reserve price of roughly EUR 24/tCO_2, although the system is small in scale and covers only one installation. In other Western Balkan countries, domestic carbon pricing remains largely nascent or absent, although some governments have expressed intentions to introduce pricing mechanisms.

In Türkiye, a national ETS is under development. A new Climate Law enacted in July 2025 provides the legal basis and institutional architecture for the Turkish ETS (TR ETS), with a pilot phase anticipated in 2026-2027 and full implementation in subsequent years. For Ukraine, the situation is more uncertain. Before the full-scale war, Ukraine had initiated discussions on ETS reform and carbon pricing, but a fully operational system has not yet emerged.

[6] From draft of Poland's updated National Energy and Climate Plan (NECP).

2. Analytical framework

2.1. Scenario design

Potential CBAM revenues for 2030 and 2035 are estimated under two scenarios: a **Reference Scenario**, which assumes the continuation of the current CBAM configuration, and an **Extension Scenario**, which assumes the inclusion of additional products through both vertical (downstream) and horizontal (energy-intensive) expansion.

1) **Reference Scenario** includes the current CBAM product list (excluding hydrogen), namely:
    - electricity,
    - iron and steel,
    - aluminium,
    - fertilizers,
    - cement.

    Hydrogen is excluded due to the negligible current level of hydrogen imports to the EU and uncertainty regarding its future role (e.g. widespread adoption of green hydrogen could alter emission profiles and CBAM relevance).

    For iron and steel and aluminium, only scope 1 emissions are covered, whereas for the other goods coverage extends to scope 2 as well. Under this scenario, no product extensions are expected by 2035.

2) **Extension Scenario** includes all products covered in the Reference Scenario and assumes that, from 2030, CBAM will be extended both vertically and horizontally to cover:
    - Indirect emissions (scope 2) for iron and steel and aluminium.
    - Additional products from energy-intensive industries (scope 1 and 2):
        - paper and paper products (including printing),
        - refinery products,
        - chemicals (excluding fertilisers) and pharmaceuticals,
        - plastics,
        - other non-metallic minerals (excluding cement),
        - other non-ferrous metals (excluding iron, steel, and aluminium).
    - Downstream goods (scope 2 emissions and emissions embedded in CBAM-covered materials like steel, aluminium, fertilisers, cement):
        - fabricated metal products,
        - electronics,

- electrical equipment,
- vehicles,
- transport equipment,
- furniture,
- other industrial products,
- agricultural products.

This scenario assumes that emissions are accounted for only one additional production stage, rather than the entire supply chain. This simplifying assumption reflects both data limitations and administrative feasibility.

The remaining economic assumptions, set out below, are identical for both the Reference and Extension Scenarios.

2.2. Data, assumptions, and calculation procedure

Procedure underlying projections of CBAM revenues can be summarised in the following steps:

1) Calculate the embedded emissions in 2024 imports, using trade data and product-specific emission intensities.
2) Project embedded emissions to 2030 and 2035, based on expected GDP growth and assumed reductions in emission intensities in non-EU countries.
3) Determine the number of CBAM certificates to be surrendered, applying reductions related to the CBAM factor and foreign carbon prices.
4) Estimate CBAM revenues by multiplying the number of certificates by the projected EU ETS allowance prices.

Step 1 - **Base year imports and emission intensities**

Imports: Import data for 2024, broken down by product (CN codes), receiving EU country, and partner non-EU country, are taken from the Eurostat COMEXT database. For each receiving (reporter) EU country, the import structure by product and source country is held constant over the projection horizon (2030 and 2035).

Emission intensities: Embedded emissions are calculated by multiplying import volumes by the relevant product-specific emission intensities, which cover direct and/or indirect emissions depending on the product.

For products on the current CBAM list (excluding electricity) - electricity, iron and steel, aluminium, fertilisers, and cement, included in both the Reference and Extension

Scenarios, benchmark (default) values from the CBAM transitory phase are used. These are expressed in tonnes of CO_2 equivalent per tonne of product.

For electricity, projected emission intensities from the Global Energy and Climate Outlook (GECO) 2021 are applied (the data were available on a country level).

For additional products included only in the Extension Scenario, emission intensities are estimated using GTAP 11 data for 2017, adjusted to 2024 to reflect global trends in emissions from electricity generation and steel production. These estimates are less detailed than CBAM benchmarks, being available only at the two-digit CPA classification level.

Step 2 - **Import volume and emission intensity projections**

GDP projections by EU Member State are based on PRIMES (2021). These growth rates are applied uniformly to all imported goods, thus preserving the structure of imports by product and source country. Compared to 2024, the resulting import volume increases are assumed to be as follows: EU average: +7% in 2030 and +14% in 2035; Poland: +16% in 2030 and +29% in 2035.

Projections for 2030 and 2035 also account for a gradual decline in emission intensities for non-EU producers, assumed to occur at an average annual rate of 1.4% up to 2035. This rate represents an intermediate value between the maximum and minimum improvement rates adopted by the European Commission when setting benchmarks for Phase IV of the EU ETS [Marcu, 2024]. Although these benchmark-based rates are derived from developments within the EU, they are applied here to non-EU exporters to reflect an assumed progressive reduction in their emission intensities as part of the global energy transition. This constitutes a simplifying assumption and may not fully capture differences in decarbonisation trajectories across regions. However, from a revenue perspective, this assumption is conservative: if non-EU producers decarbonise more slowly than assumed, embedded emissions – and thus CBAM revenues – would be higher than presented here.

Step 3 - **Foreign carbon price assumptions and sensitivity analysis**

While all key assumptions underlying the CBAM revenue projections (e.g. import growth, changes in emission intensities, EU ETS allowance prices) involve a degree of uncertainty and simplification, arguably the greatest uncertainty relates to the regulatory responses of EU trade partners to CBAM. These responses will directly affect effective foreign carbon prices, which in turn determine the number of CBAM certificates to be surrendered.

To reflect this uncertainty, a sensitivity analysis is carried out along this dimension. The focus is limited to this factor alone, as varying multiple dimensions simultaneously would make the analysis overly complex and difficult to interpret.

For each scenario (Reference and Extension), three foreign carbon price variants are considered:

- **Status Quo**: Carbon pricing systems remain relatively limited globally, and where they exist, prices are generally well below EU ETS levels. Carbon prices are assumed to stay at their 2024 levels, updated to 2030 and 2035 using annual growth rates of 10%, 5%, or 2%, depending on the country, to reflect the likely tightening of emission caps.
- **Moderate Alignment**: All trade partners implement domestic policies that raise carbon prices to 25% of the EU ETS price by 2030 and 50% by 2035, applied worldwide. The United Kingdom is assumed to be fully aligned with the EU ETS.
- **Strong Alignment**: Carbon prices reach 50% of the EU ETS price by 2030 and 75% by 2035, again applied worldwide except for the United Kingdom, which remains fully aligned with the EU ETS.

This sensitivity analysis is integrated into the presentation of all CBAM revenue results.

Step 4 - **EU ETS carbon prices**

EU ETS allowance prices are assumed at EUR 123/tCO_2 in 2030 and EUR 147/tCO_2 in 2035, expressed in 2024 prices (Ministry of Climate and Environment, 2024). These figures reflect the official carbon price trajectories used in the draft of the updated National Energy and Climate Plan (NECP, 2024) and serve as the reference for calculating the value of CBAM certificates.

2.3. Limitations

This analysis relies on a set of simplifying assumptions that allow for consistent and transparent revenue projections, but it does not capture several important behavioural and systemic effects. It should therefore not be interpreted as a comprehensive CBAM impact assessment.

First, the approach does not incorporate behavioural responses to CBAM-induced costs, such as potential slowdowns in import growth or shifts in trade patterns. The price elasticity of import demand and the extent to which CBAM costs are passed through to import prices are both highly uncertain - and importantly, they are heterogeneous across products and trading partners. As a result, actual CBAM revenues may differ from the projections presented here once these second-round effects are taken into account.

Second, the analysis keeps the EU ETS carbon price trajectory exogenous and does not model how CBAM might affect allowance demand, market expectations, or EUA prices. In reality, higher domestic production in CBAM-covered sectors, induced by reduced leakage, could increase EUA demand and push prices upwards. This would amplify both CBAM and ETS-

based auction revenues, with implications for the overall fiscal balance that are not captured in this study.

Third, the treatment of exemptions (e.g. de minimis thresholds, military uses, electricity interconnections) is necessarily stylised due to data limitations. Available evidence suggests that these exemptions mainly affect a large number of small importers while covering only a marginal share of embedded emissions in the core CBAM sectors. As such, their omission is unlikely to materially change aggregate revenue estimates, but it may matter for more granular distributional analyses.

Fourth, in projecting import volumes, GDP growth rates are applied uniformly to all imports. This provides a transparent and methodologically consistent baseline, avoiding the need to specify uncertain and highly heterogeneous product- and partner-specific trade elasticities. Although historical evidence suggests that imports often grow faster than GDP, this approach also represents a conservative assumption, helping to limit the risk of revenue overestimation in the absence of behavioural modelling.

Fifth, carbon price trajectories, especially for EU ETS allowances, are inherently uncertain, being subject to both market dynamics and regulatory developments. Other important sources of uncertainty include emission intensity forecasts and the gap between benchmark and actual emission intensities, which can vary across countries and producers.

Sixth, the analysis does not attempt to model CBAM's macroeconomic or sectoral impacts. While CBAM is expected to reduce non-EU imports in favour of EU production, this effect may be partially offset by higher costs of imported inputs. Moreover, at the Member State level, CBAM may simply redirect imports from extra-EU to intra-EU sources, without leading to a net increase in domestic output.

Finally, a full assessment of net budgetary impacts, however, would require analysing CBAM's indirect effects on other tax bases and revenues, a task that lies beyond the scope of this study.

3. Results

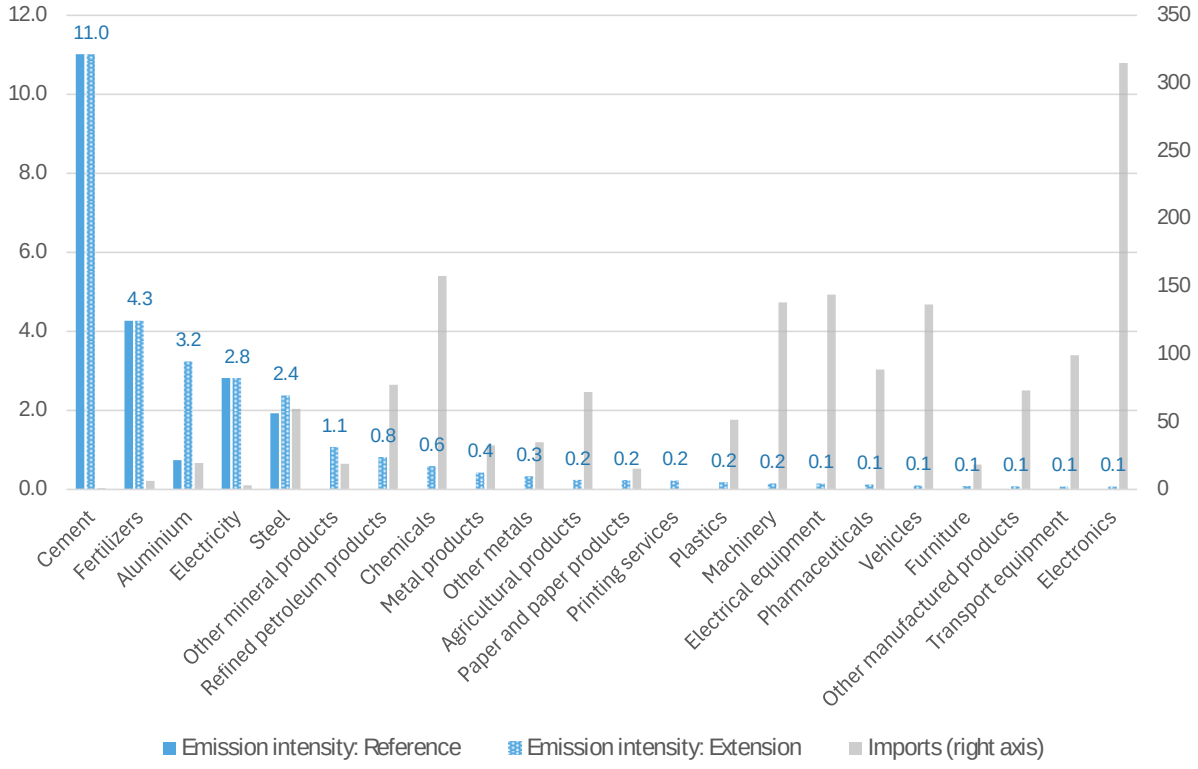
This section presents the core analytical findings regarding the volume of emissions embedded in EU and Polish imports, and the resulting potential CBAM-related revenues under the Reference and Extension scenarios. It also examines how revenues vary depending on foreign carbon pricing policies, including implications for neighbouring and candidate countries. The methodological framework underpinning these estimates is summarised in Section 2.

3.1. Emission embedded in imports

The amount of emissions embedded in imports is driven by two main factors:

- Emission intensity (i.e. emissions per unit of imported quantity or value[7]), which varies widely across product categories.
- Import volumes, which determine the overall scale of emissions entering the EU market through trade.

Figure 3. Average emission intensities of imports to the EU in 2024 (kg CO_2 eq / EUR, 2024 prices) and imports (EUR billion, 2024 prices)

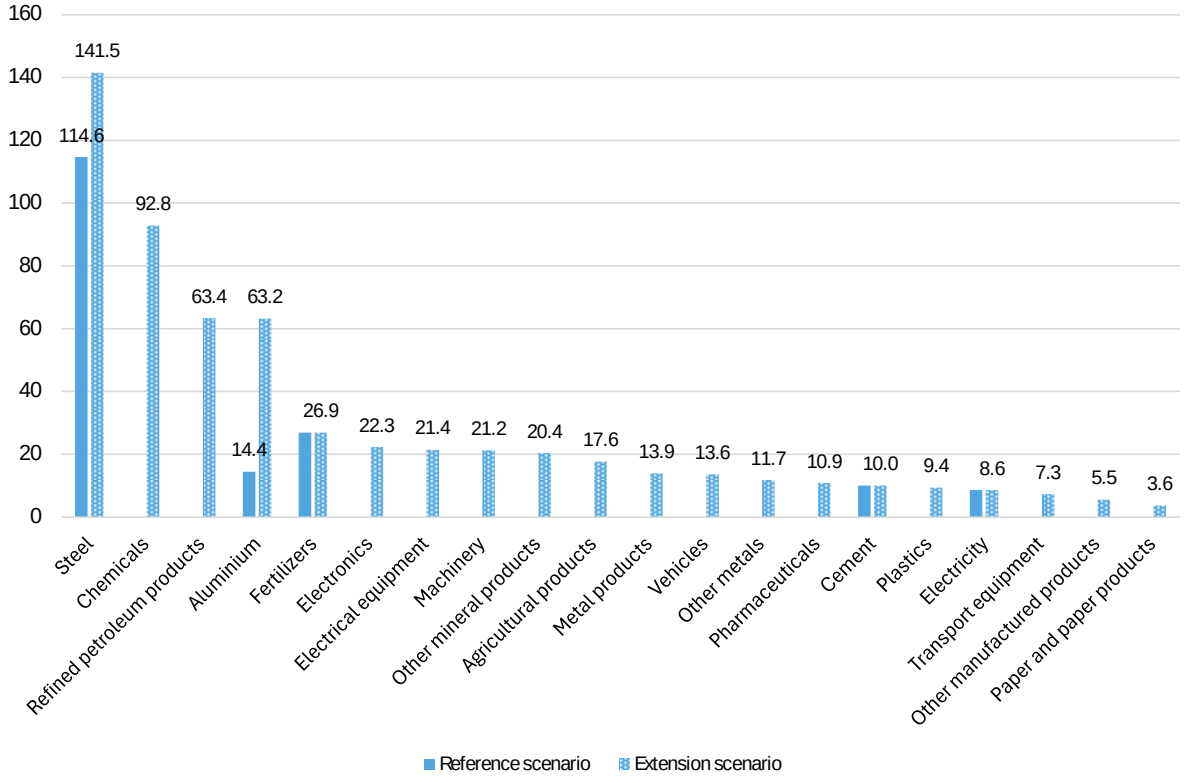


Source: CAKE/KOBiZE

[7] For goods covered under the current CBAM scope (Reference Scenario), embedded emissions are calculated based on emissions per physical quantity of imports. In this section, however, all emission intensities are expressed per euro of import value, to facilitate comparison across different product groups.

Current CBAM-covered products were selected because of their high emission intensity, particularly cement (Figure 3). However, these are not always the products with the highest import volumes. For example, electronics and vehicles have much lower emission intensities but are imported in far larger quantities. As a result, the ranking of products by total embedded emissions under the Extension scenario does not mirror the current CBAM list. The difference in emission intensity for aluminium is due to the inclusion of downstream products. In 2024, cement ranks only 15th in the EU among two-digit CPA product groups (approximately 10 Mt CO_2), whereas iron and steel rank first, with 115-142 Mt CO_2 depending on whether indirect emissions are included (Figure 4).

Figure 4. Emissions embedded in imports to the EU in 2024 (Mt CO_2 eq)



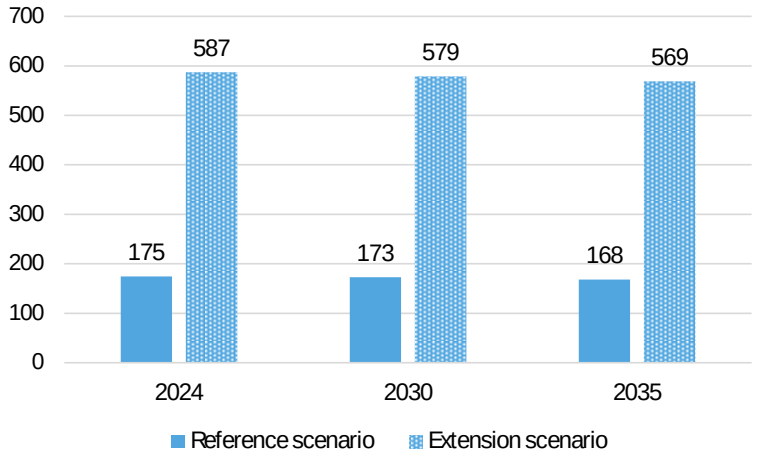
Source: CAKE/KOBiZE

Under the Reference Scenario, which reflects the current CBAM scope, the total embedded emissions in imports into the EU amount to around 175 Mt CO_2 in 2024, decreasing slightly to 173 Mt in 2030 and 168 Mt in 2035 (Figure 5). This stability reflects the offsetting effects of moderate import growth and gradual improvements in emission intensities in non-EU countries.

The Extension Scenario, which expands CBAM coverage both horizontally (additional energy-intensive industries) and vertically (downstream products), captures a much broader

emissions base. In this scenario, total embedded emissions rise to around 587 Mt CO_2 in 2024, decreasing modestly to 579 Mt in 2030 and 569 Mt in 2035 (For comparison, verified emissions from all stationary installations in the EU ETS amounted to around 1000 Mt in 2024[8]). Chemicals (excluding fertilisers) and refinery products emerge as major sources of embedded emissions, reflecting their combination of fairly high emission intensities and substantial import volumes. Downstream products contribute additional emissions, though their unit intensities remain low.

Figure 5. Projected aggregate emissions embedded in imports to the EU (Mt CO_2 eq)



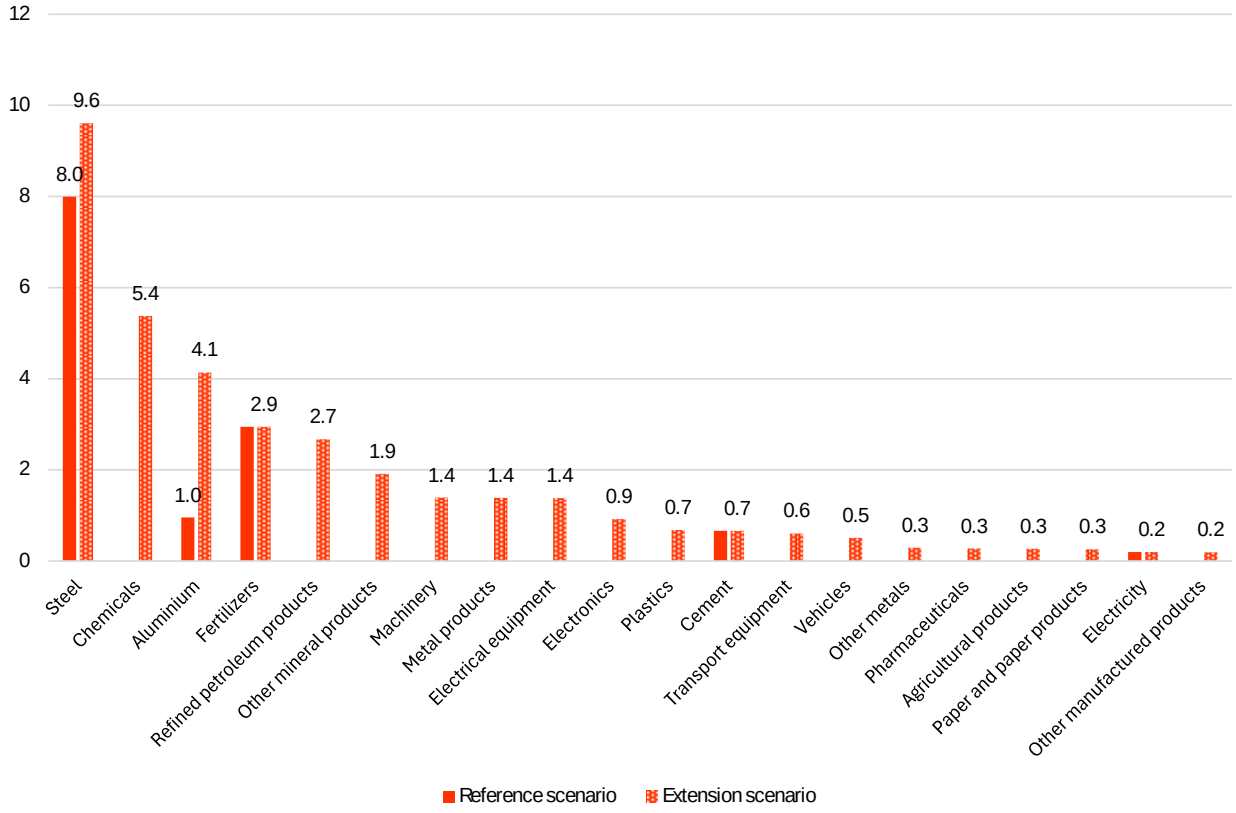
Source: CAKE/KOBiZE

For Poland, the product structure of embedded emissions is broadly similar to that of the EU. Iron and steel account for the largest share (9.6 Mt in 2024 under the Extension Scenario), followed by chemicals, aluminium, fertilisers, and refined oil products (

Figure *6*). Under the Extension Scenario, total embedded emissions in Polish imports increase only modestly over time, from 36 Mt CO_2 in 2024 to 38 Mt in 2030 and 39 Mt in 2035 (**Figure 7**). A similar pattern is observed under the Reference Scenario, where emissions remain stable at around 13-14 Mt CO_2 throughout the projection period.

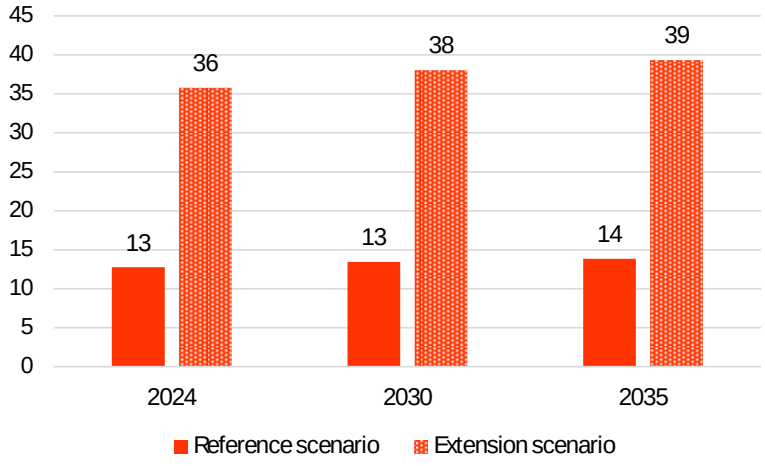
[8] Based on data from the EU Emissions Trading System (ETS) Data Viewer, European Environment Agency (EEA).

Figure 6. Emissions embedded in imports to Poland in 2024 (Mt CO_2 eq)



Source: CAKE/KOBiZE

Figure 7. Projected aggregate emissions embedded in imports to Poland (Mt CO_2 eq)



Source: CAKE/KOBiZE

3.2. Budgetary revenues from CBAM

Projected revenues are calculated by applying the CBAM factor and the assumed EU ETS allowance prices (EUR 123/tCO_2 in 2030; EUR 147/tCO_2 in 2035) to the embedded emissions volumes, adjusted for carbon pricing in exporting countries.

- Three elements drive revenue outcomes:
  1) **Scope of CBAM coverage** - the Extension Scenario generates roughly three times more revenue than the Reference Scenario, due to its broader coverage of embedded emissions.
  2) **Foreign carbon pricing** - revenues depend strongly on how quickly trading partners align their carbon prices with the EU ETS. Under the Strong Alignment variant, projected revenues are less than half of those under Status Quo by 2030.
  3) **Phase-out of free allocation** - as free allowances are phased out by 2035, the CBAM factor reaches 100%, substantially increasing the share of embedded emissions subject to CBAM payments.
- For the EU as a whole (**Figure 8**):
  - Under the Reference Scenario, revenues are projected at EUR 5-9 billion in 2030 (point estimate) and EUR 6-22 billion in 2035 (in 2024 prices), depending on foreign carbon pricing.
  - Under the Extension Scenario, revenues increase to EUR 16-31 billion in 2030 and EUR 20-75 billion in 2035.
- For Poland (**Figure 9**):
  - Under the Reference Scenario, projected revenues amount to EUR 0.4-0.8 billion in 2030 and EUR 0.5-1.9 billion in 2035.
  - Under the Extension Scenario, they rise to EUR 1.1-2.1 billion in 2030 and EUR 1.4-5.3 billion in 2035.

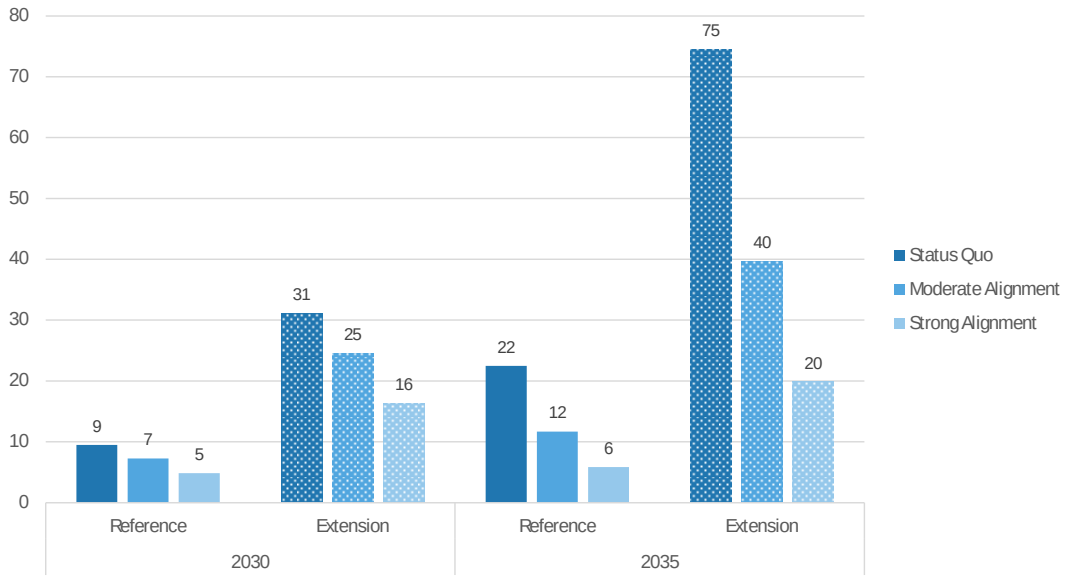
Between 2030 and 2035, revenues increase significantly due to the rising CBAM factor, even though embedded emissions remain relatively stable. However, if partner countries raise their domestic carbon prices in parallel, this revenue effect is partly offset.

Compared with the European Commission's impact assessment, which projects CBAM-based own resources, with a possible scope extension, of around EUR 1.4 -1.5 billion per year from 2028 onwards[9], the scenarios presented here yield substantially higher revenue ranges for

[9] Commission staff working document accompanying the document Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions - *A dynamic EU budget for the priorities of the future: the Multiannual Financial*

2030. This divergence primarily reflects higher ETS price assumptions and the fact that Commission figures are reported as multi-year averages, whereas the present analysis focuses on specific years with a more advanced phase-out of free allocation.

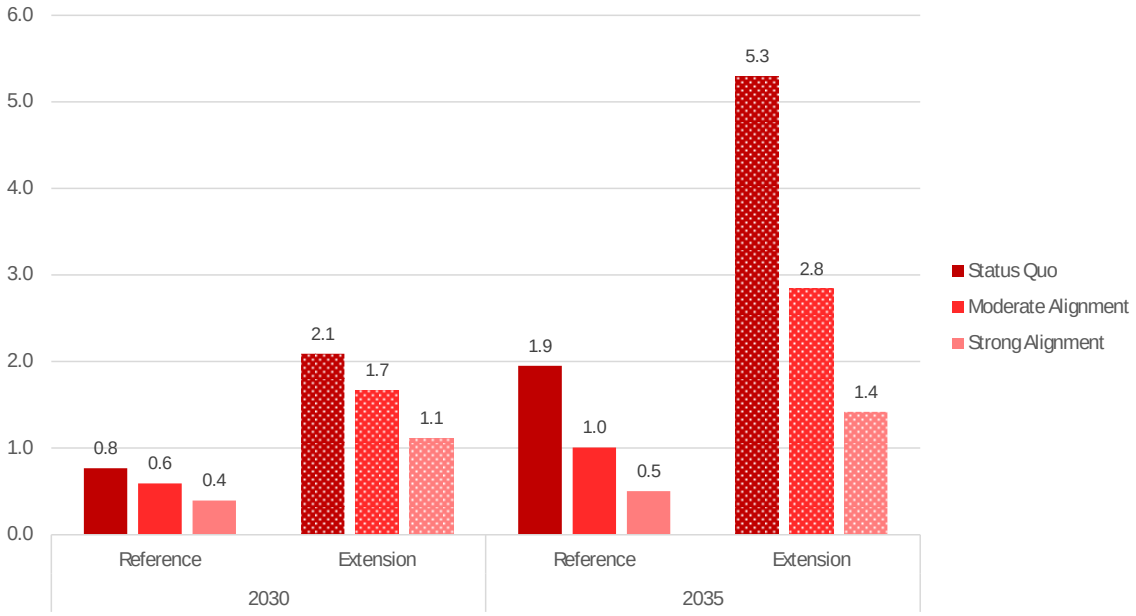
Figure 8. Projected aggregate budgetary revenues from CBAM in the EU (EUR billion, 2024 prices)



Based on **EU ETS prices** of **EUR 123**/tCO₂ (**2030**) and **EUR 147**/tCO₂ (**2035**), 2024 prices.
Source: CAKE/KOBiZE

Framework 2028-2034 {COM(2025) 570 final} - {SWD(2025) 571 final}: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52025SC0570R(01)

Figure 9. Projected aggregate budgetary revenues from CBAM in Poland (EUR billion, 2024 prices)

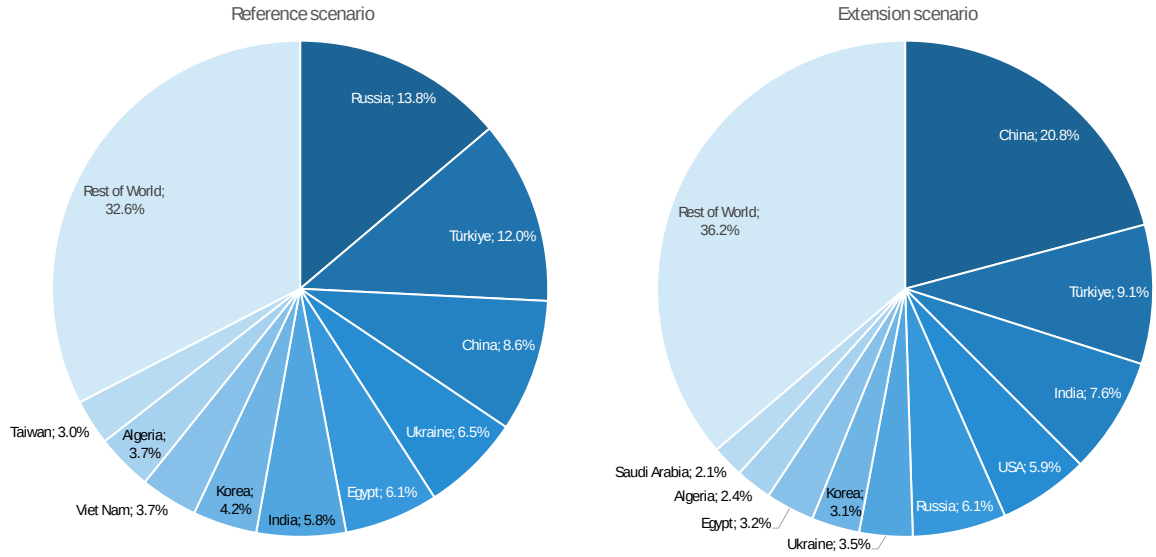


Based on **EU ETS prices** of **EUR 123**/tCO₂ (**2030**) and **EUR 147**/tCO₂ (**2035**), 2024 prices.
Source: CAKE/KOBiZE

3.3. Distributional patterns across products and trading partners

The structure of CBAM revenues mirrors that of embedded emissions. Under the Reference Scenario, steel dominates revenue streams, followed by fertilisers. In the Extension Scenario, chemicals and refinery products become major revenue sources (for details see Figures 14-17 in **Annex II**).

Figure 10. Projected budgetary revenues from CBAM in the EU by country of imports origin (%) - average across years (2030-2035) and carbon pricing alignment variants

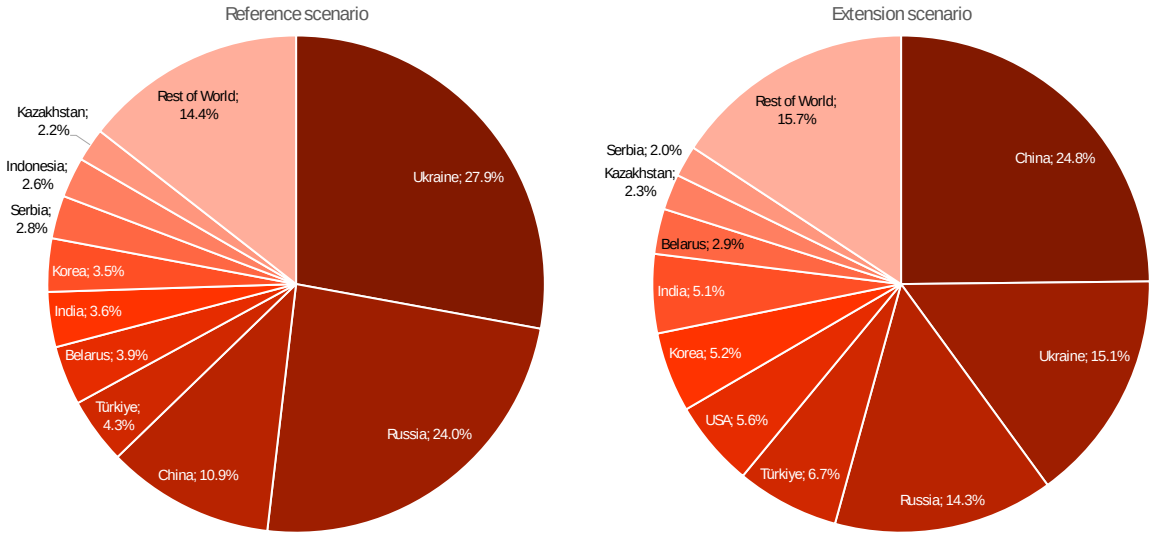


Source: CAKE/KOBiZE

The geographical distribution of revenue also shifts with CBAM extension. Under the Reference Scenario, China accounts for around 9% of total EU CBAM revenue, while under the Extension Scenario this rises to 21% (**Figure 10**), whereas the share of the United States increases from 2% to 6%. Similar patterns are observed for Poland (China's share rising from 11% to 25%) (**Figure 11**). Conversely, the relative importance of Ukraine declines as product coverage expands beyond steel, fertilisers and other products from the current CBAM list.

This shift underscores the growing centrality of China in the CBAM revenue base, especially under broader product coverage, and highlights the importance of EU–China dialogue on carbon pricing and industrial decarbonisation.

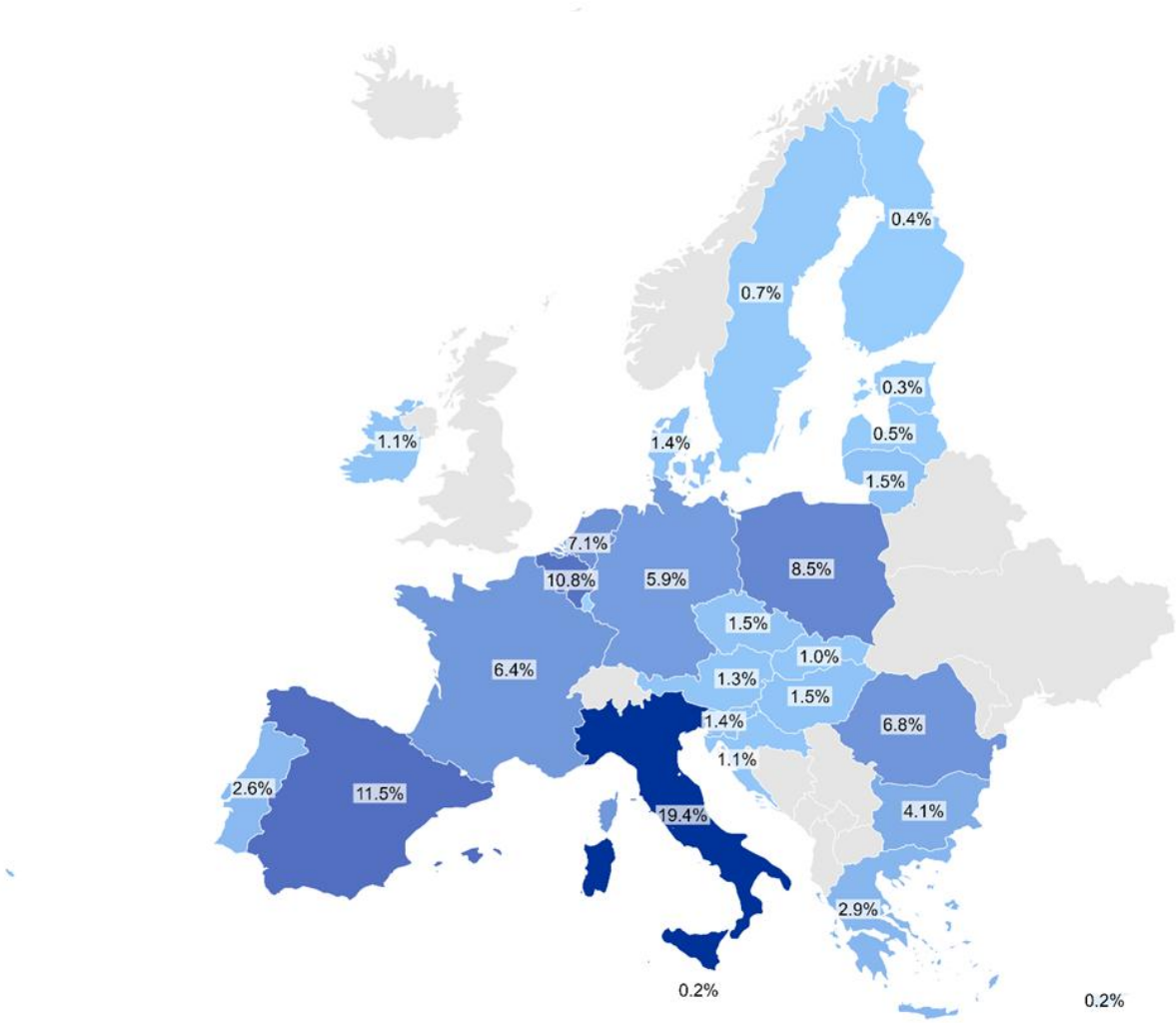
Figure 11. Projected budgetary revenues from CBAM in Poland, by country of imports origin (%) - average across years (2030-2035) and carbon pricing alignment variants



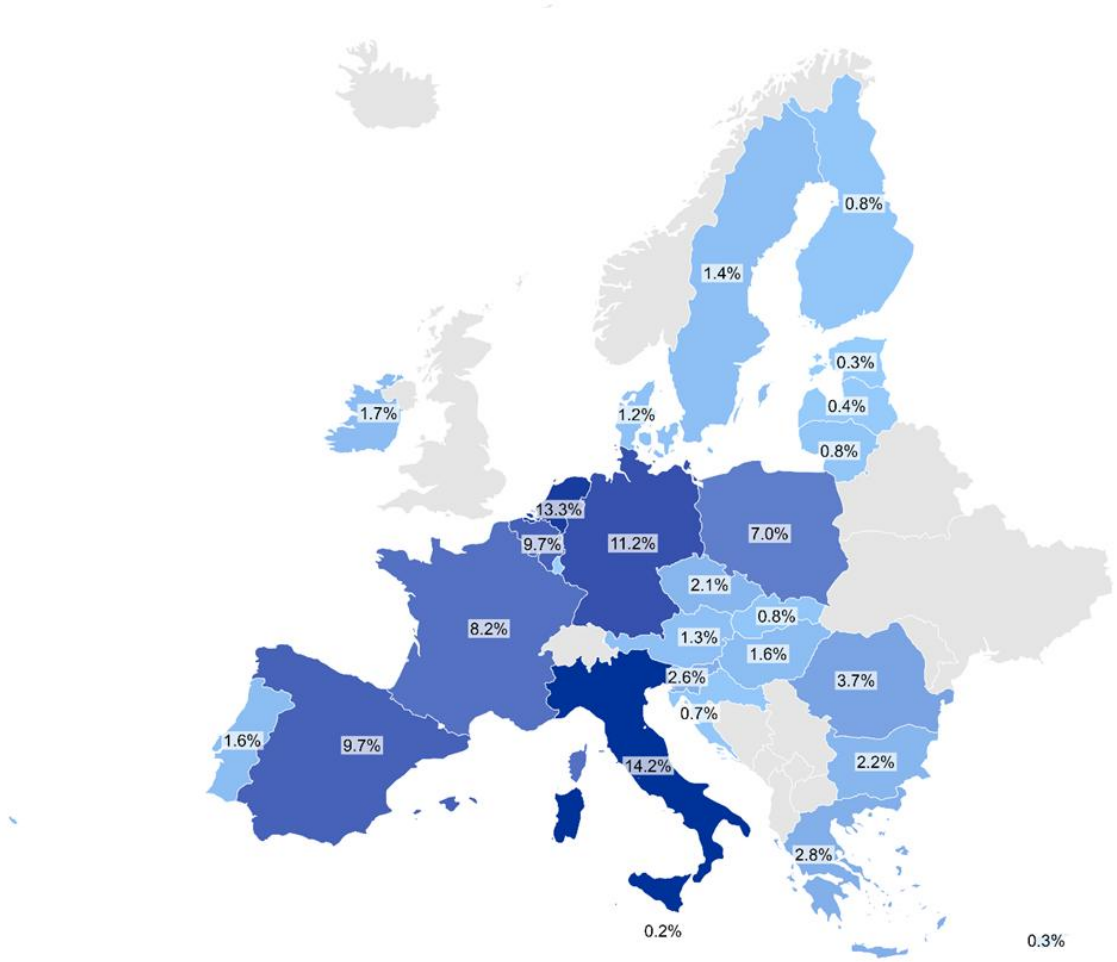
Source: CAKE/KOBiZE

Figure 12. CBAM revenue by receiving country (%) - average across years (2030-2035) and carbon pricing alignment variants

Reference scenario



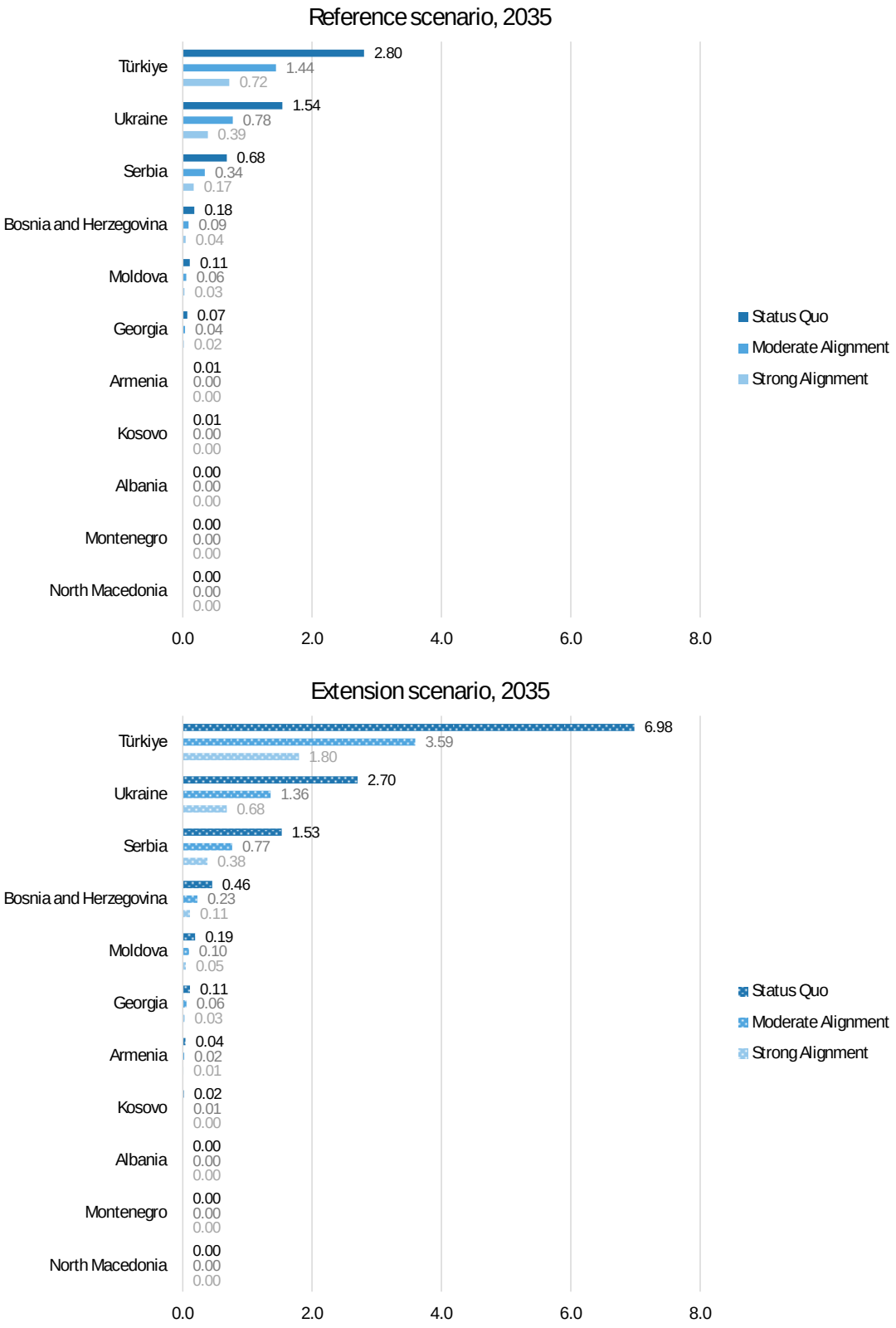
Extension scenario



Source: CAKE/KOBiZE

Among EU Member States, Italy generates the largest share of CBAM revenue in both scenarios, around 19% in the Reference and 14% in the Extension (**Figure 12**). Spain, Belgium, the Netherlands, and Germany follow, reflecting their import structures. Poland's share of total EU CBAM revenue is estimated at 7-8%, depending on the scenario (see **Annex II** for details). Poland's smaller share in the overall CBAM revenue pool under the extension scenario means a relatively smaller contribution by Poland to the financing of new EU own resources, including instruments related to the repayment of joint debt after NextGenerationEU. This means that the extension of CBAM is fiscally beneficial for Poland, as the total pool of EU revenues increases, but the burden is distributed more evenly, which reduces the relative burden on countries with lower imports of high-emission products. In addition, the extension of CBAM protects the Polish processing industry, as it also covers highly processed products, so that imports from outside the EU can no longer compete by avoiding emission costs, which restores fair competition conditions for Polish companies.

Figure 13. Projected CBAM revenue / import cost by neighbouring and candidate countries (EUR billion, 2024 prices)



Based on **EU ETS prices** of **EUR 123**/tCO_2 (**2030**) and **EUR 147**/tCO_2 (**2035**), 2024 prices.

Source: CAKE/KOBiZE

3.4. Implications for neighbouring and candidate countries

For neighbouring and candidate countries, CBAM represents both a cost exposure (as EU importers purchase certificates) and a potential fiscal opportunity, if these countries introduce domestic carbon pricing that can be credited under CBAM.

By 2035, under the Reference Scenario, the largest CBAM-related import costs are projected for Türkiye (EUR 0.7-2.8 billion) and Ukraine (EUR 0.4-1.5 billion), followed by Serbia. Under the Extension Scenario, these figures rise substantially (Türkiye: EUR 2-7 billion; Ukraine: EUR 0.7-2.7 billion) (**Figure 13**). The magnitude of these costs highlights the strategic importance of domestic carbon pricing reforms in neighbouring economies, particularly for energy-intensive sectors.

For these countries, the choice is therefore not only whether to accept CBAM-related costs, but how to recycle carbon pricing revenues domestically. Introducing or strengthening national ETS or carbon tax systems – designed in a way that allows crediting under CBAM – would enable them to capture part of the revenue currently accruing to the EU budget, while supporting their own transition investment needs. This is particularly relevant for Ukraine and Türkiye, given the scale of projected CBAM-related import costs.

For Montenegro, Albania, and North Macedonia which are assumed to join the EU ETS by 2035 - CBAM will no longer apply to their exports to the EU from that point onwards, as these flows will be treated as intra-EU trade.

4. Summary

This report has analysed the potential budgetary revenues arising from the EU Carbon Border Adjustment Mechanism (CBAM) for the European Union as a whole and for Poland, focusing on the years 2030 and 2035. The analysis considers two scenarios: a Reference Scenario, limited to the current CBAM product coverage, and an Extension Scenario, which assumes a broader scope both horizontally (additional energy-intensive products) and vertically (downstream products). Three foreign carbon pricing variants - Status Quo, Moderate Alignment, and Strong Alignment - are used to reflect possible regulatory responses by EU trading partners.

The results highlight three key findings.

- First, CBAM extension significantly increases the coverage of embedded emissions and potential revenues. Under the Reference Scenario, total embedded emissions in EU imports are estimated at around 175 Mt CO_2 in 2024, decreasing slightly to 168 Mt by 2035. Under the Extension Scenario, coverage expands to approximately 587 Mt in 2024 and 569 Mt in 2035, reflecting the inclusion of additional product groups, notably chemicals, refinery products, and downstream manufacturing sectors. The Extension Scenario also captures indirect (scope 2) emissions for steel and aluminium, which provides a further meaningful increase in coverage, particularly in the case of aluminium due to its high electricity intensity.

  This broader coverage translates into a substantial increase in projected CBAM revenues: from EUR 5-9 billion in 2030 (in 2024 prices) and EUR 6-22 billion in 2035 under the Reference Scenario, to EUR 16-31 billion in 2030 and EUR 20-75 billion in 2035 under the Extension Scenario. For Poland, revenues increase from EUR 0.4-0.8 billion (2030) and EUR 0.5-1.9 billion (2035) in the Reference Scenario to EUR 1.1-2.1 billion and EUR 1.4-5.3 billion, respectively, in the Extension Scenario.

- Second, the evolution of CBAM revenues over time is driven less by changes in embedded emissions than by regulatory parameters and foreign policy choices. Embedded emissions in imports remain relatively stable over the projection horizon due to the offsetting effects of import growth and declining emission intensities in third countries. This finding should be understood alongside the previous point on product coverage: while coverage expansion is a major driver of differences in revenue levels across scenarios, the year-to-year evolution within each scenario is shaped mainly by other factors.

  Revenue growth is primarily driven by the progressive increase in the CBAM factor between 2026 and 2035, reflecting the phase-out of free allocation under the EU ETS. At the same time, the degree of carbon price convergence in third countries exerts a strong moderating effect. Under the Strong Alignment variant, where foreign carbon prices reach

75% of the EU ETS level by 2035, EU CBAM revenues are reduced by a factor of three to four compared with the Status Quo.

These results reflect the methodological choice to explore uncertainty mainly through the foreign carbon pricing dimension, while assuming relatively simple and uniform dynamics of import volumes and emission intensities across products. In reality, emission intensities may not decrease as assumed, or may depend more strongly on differing mitigation ambitions across countries. This should be borne in mind when interpreting the projections.

- Third, CBAM has heterogeneous implications across products, Member States, and trading partners. Under the current scope, steel and aluminium dominate the emissions and revenue structure. With CBAM extension, chemical and refinery products become major sources of revenue, while downstream sectors contribute additional, though less emission-intensive, volumes. Among EU Member States, Italy consistently accounts for the largest share of total CBAM revenue, followed by Spain, Belgium, the Netherlands, Germany, and Poland. On the partner country side, China's share of CBAM revenues increases substantially under the Extension Scenario, reflecting the importance of its exports of downstream products to the EU. For neighbouring and candidate countries, notably Türkiye and Ukraine, CBAM represents both a significant cost exposure and a potential fiscal opportunity if domestic carbon pricing is introduced.

The extension of CBAM significantly increases the stability and predictability of the EU's own resources, as it covers a larger share of international trade and a wider range of emissions. The broad product base reduces the risk of circumventing the mechanism by replacing raw materials with imports of highly processed products, which strengthens the integrity of EU climate policy. As a result, CBAM more effectively prevents carbon leakage and supports the competitiveness of European industry. Broader sectoral coverage also contributes to a more equitable distribution of costs among Member States. As a result, the expanded CBAM strengthens both the financial and regulatory foundations of the EU's climate transition.

In the case of Poland, the extension of CBAM lowers its relative share in total EU revenues, reducing Poland's contribution to new EU own resources and to the repayment of joint debt.This makes the mechanism fiscally favourable for Poland, as a broader revenue base spreads the burden more evenly. By also covering highly processed goods, the extension strengthens the competitiveness of Poland's processing sector by preventing non-EU imports from avoiding carbon costs.

Overall, CBAM could emerge as an important new source of budgetary revenue for the EU and its Member States, with 75% of proceeds channelled to the EU budget as part of the ongoing reform of the Union's system of own resources. However, the future scale of these revenues depends critically on the scope of CBAM coverage, the trajectory of foreign carbon pricing, the level of EU ETS allowance prices, and the effectiveness of administrative

implementation. Extending CBAM downstream would increase revenues and reduce carbon leakage risks but would also raise administrative complexity. In parallel, higher carbon pricing in third countries would reduce EU CBAM revenues while supporting global decarbonisation objectives, which serves as a reminder that CBAM's fiscal role is closely intertwined with its climate policy function.

References

1. Aguiar, A., Chepeliev, M., Corong, E. L., McDougall, R., van der Mensbrugghe, D. (2023), The GTAP Data Base: Version 11, Center for Global Trade Analysis, Purdue University, available at: https://www.gtap.agecon.purdue.edu/databases/v11/ [last accessed: 06.06.2025].
2. Elkerbout, M., Nehrkorn, K., Kleimann, D. (2025). For Climate-and-Trade Policies, the Principle of "Common but Differentiated Responsibilities" Cuts Both Ways. Issue Brief 25-08. Resources for the Future, May 2025. https://www.rff.org/documents/4898/IB_25-08_updated.pdf [last accessed: 09.10.2025].
3. European Commission (2020). Commission Communication - Guidelines on certain State aid measures in the context of the system for greenhouse gas emission allowance trading post-2021 (2020/C 317/04), link: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:C:2020:317:FULL [last accessed: 10.04.2025].
4. European Commission (2021). Update of benchmark values for the years 2021 - 2025 of phase 4 of the EU ETS: Benchmark curves and key parameters (final version issued on 15 June 2021), link: https://eur-lex.europa.eu/legal-content/PL/TXT/?uri=CELEX%3AE2021X0415%2801%29 [last accessed: 10.04.2025].
5. European Commission (2023a). *Default values for the transitional period of the CBAM between 1 October 2023 and 31 December 2025*, link: https://taxation-customs.ec.europa.eu/system/files/2023-12/Default%20values%20transitional%20period.pdf [last accessed: 10.04.2025].
6. European Commission (2023b). Commission Implementing Regulation (EU) 2023/1773 of 17 August 2023 laying down rules for the application of Regulation (EU) 2023/956 of the European Parliament and of the Council as regards reporting obligations for the purposes of the transitional period of the carbon border adjustment mechanism, Official Journal of the European Union, link: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023R1773 [last accessed: 10.04.2025].
7. European Commission (2024). *Guidance for CBAM implementation for importers bringing goods into the EU*, Brussels, 30 May 2024, link: https://taxation-customs.ec.europa.eu/document/download/bc15e68d-566d-4419-88ec-b8f5c6823eb2_pl?filename=TAXUD-2023-01189-01-00-PL-TRA-00.pdf [last accessed: 10.04.2025].
8. European Commission (2025). Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2023/956 as regards simplifying and strengthening the carbon border adjustment mechanism, link: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52025PC0087 [last accessed: 10.04.2025].
9. European Commission (2025). Commission Staff Working Document. Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the regions
10. Keramidas, K., Fosse, F., Díaz Vázquez, A., Dowling, P., Garaffa, R., Després, J., Russ, P., Schade, B., Schmitz, A., Soria, Ramirez, A., Vandyck, T., Weitzel, M., Tchung-Ming, S., Diaz

Rincon, A., Rey Los Santos, L., Wójtowicz, K. (2021). Global Energy and Climate Outlook 2021: Advancing towards climate neutrality, EUR 30861 EN, Publications Office of the European Union, Luxembourg, 2021, ISBN 978-92-76-42314-0, doi:10.2760/410610, JRC126767, link: https://publications.jrc.ec.europa.eu/repository/handle/JRC126767 [last accessed: 10.04.2025].

11. Marcu, A., Mehling, M., Cosbey, A., Svensson, S. (2024). *Review of Carbon Leakage Risks of CBAM Export Goods*, European Roundtable on Climate Change and Sustainable Transition (ERCST), link: https://ercst.org/review-of-carbon-leakage-risks-of-cbam-export-goods/ [last accessed: 10.04.2025].
12. Ministry of Climate and Environment (2024). *Forecasting assumptions and forecasting methodology - Annex 3 to the draft aKPEiK*, Warsaw, October 2024, link: https://bip.mos.gov.pl/fileadmin/user_upload/bip/dostep_do_informacji/2024-10-11_Zal_3_do_proj_aKPEiK_Zalozenia_prognostyczne.pdf [last accessed: 10.04.2025].
13. PRIMES (2021). Reference scenario: Detailed Analytical Results, E-3 Modelling.

Annex I. Methodological details

- This annex provides additional methodological details underlying the quantitative analysis presented in the report. It describes the data sources and assumptions used to calculate embedded emissions, carbon pricing trajectories, and CBAM revenue calculation under the different scenarios.

A. Imports

- Import data for 2024 were sourced from Eurostat's COMEXT database, covering approximately 8,000 product categories. The dataset includes:
  - Import values expressed in EUR at current 2024 prices.
  - Quantities expressed in kilograms or in MWh for electricity.
  - A detailed product breakdown at the CN classification level.
  - Hydrogen was excluded due to its negligible import volume in the baseline year.
- Import projections for 2030 and 2035 were derived by applying GDP growth rates by product category, consistent with the transformation scenario results in the Impact Assessment of the Fit for 55 Package (based on the PRIMES model, European Commission, 2021). This implies that import volumes grow in line with projected GDP, with no additional trade policy or structural changes assumed.

B. Emission intensities

- For products currently covered by CBAM (cement, iron and steel, aluminium, fertilisers, electricity), emission intensities were based on the benchmark values used during CBAM's transitional phase. Although the definitive phase will rely on actual emission data reported by importers, these benchmarks remain the best available source at present.
  - Benchmarks refer to specific CN codes, expressed in tonnes of CO_2 per tonne of product (or per MWh for electricity).
  - For projections to 2030 and 2035, benchmark values were reduced annually by 1.4 %, reflecting assumed gradual global decarbonisation.
- For additional products included in the Extension Scenario, emission intensities were sourced from the GTAP 11 Circular Economy database (kg CO_2 per USD of 2017 product value) (Aguiar et al. 2023). These data were:
  - Updated to 2024 EUR using a correction factor based on the change in average EU import prices between 2017 and 2024.
  - Refined to reflect global trends, including declining electricity emission intensities and a slight increase in global steel emission intensity.

- The emission intensity of imported electricity was estimated using GECO 2021 projections (Keramidas et al., 2021), combined with the structure of electricity imports by country of origin.
- For downstream products in the Extension Scenario, emission coverage goes beyond standard scope 2. In addition to electricity-related indirect emissions, the calculations include emissions of precursor inputs - such as steel, aluminium, cement, and fertilisers - used in the production of downstream goods. This represents an "extended embedded emissions" approach, consistent with CBAM's treatment of emissions of these precursors in the implementing regulation.
- For steel and aluminium, scope 2 emissions are also included, in addition to scope 1. Unlike the calculation of embedded emissions for CBAM-listed products, which is based on transitional benchmark values, embedded precursor emissions are calculated using emission intensities from the GTAP 11 database for the relevant precursor sectors.

C. Carbon pricing assumptions

- Foreign carbon pricing trajectories are developed for the three variants defined in the main report:
  - Status Quo - limited and uneven carbon pricing outside the EU, reflecting current global price levels and coverage, extrapolated over time.
  - Moderate Alignment - foreign effective carbon prices reach 25 % of the EU ETS price by 2030 and 50 % by 2035; the UK is fully aligned.
  - Strong Alignment - foreign effective carbon prices reach 50 % by 2030 and 75 % by 2035; the UK is fully aligned.
- Baseline 2024 carbon price levels, shown in **Table 2**, are drawn from the World Bank Carbon Pricing Dashboard, ICAP, and national sources. These form the basis of the Status Quo variant: prices are projected forward using three alternative annual growth rates 10 %, 5 %, and 2 % to reflect different levels of foreign policy ambition.

Table 2. Baseline foreign carbon prices in 2024 - starting point for Status Quo projections

Code	Country	Price (EUR/tCO_2)	Source (as of: 31.01.25)
CN	China	12.1	World Bank, https://carbonpricingdashboard.worldbank.org/compliance/price
US	USA	21.3	ICAP (RGGI system)
KR	South Korea	6.1	World Bank
SA	Saudi Arabia	7.7	Carbon Pulse: https://carbon-pulse.com/350343/
TR	Türkiye	3.4	Türkiey's tax data from Ministry of Treasury and Finance
UA	Ukraine	0.7	Ukraine's environmental tax rates from pre-2022 legislation

GB	United Kingdom	42.5	ICE
JP	Japan	1.8	World Bank
IN	India	4.8	World Bank
RU	Russia	1.1	World Bank
VN	Vietnam	9.7	https://www.green.earth/news/vietnam-to-harness-200-million-annually-in-carbon-credits
BR	Brazil	24.1	https://carbon-pulse.com/338004/
TW	Taiwan	9.0	https://www.moenv.gov.tw/en/375192F88A851A76/ed49e408-fb08-482f-b4b7-50ebe56af0ea
BD	Bangladesh	4.8	https://ieefa.org/resources/readiness-key-bangladeshs-carbon-market-prospect
CO	Colombia	6.4	World Bank
KZ	Kazakhstan	1.0	World Bank
ME	Montenegro	24	ICAP

Source: CAKE/KOBiZE

- For the Moderate and Strong Alignment variants, foreign carbon prices are not extrapolated from 2024 levels, but instead directly set as a percentage of the EU ETS price (25%/50% and 50%/75% in 2030/2035, respectively).
- For the EU ETS, carbon price assumptions are taken from Poland's updated National Energy and Climate Plan (NECP, 2024) (
- *Table 3*). These values are used both as inputs to revenue calculations and as the reference for determining foreign effective carbon prices under the alignment scenarios.

Table 3. EU ETS carbon price assumptions for scenario calculations (2024 prices)

	2024	2030	2035
Price (EUR/tCO₂)	80	123	147

Prices are expressed in constant 2024 EUR using HICP inflation adjustments (Eurostat, 2020-2024, cumulative inflation factor: 1.226).

Source: CAKE/KOBiZE, based on draft of Poland's updated National Energy and Climate Plan (NECP)

D. CBAM Exemptions

- The methodology acknowledges but does not fully model most CBAM exemptions, except where data permit. Specifically:
  - De minimis exemption - Under proposed CBAM amendments, imports of covered goods below 50 tonnes per importer per year are exempt. This change is expected to exempt about 90 % of importers, while still capturing over 99 % of embedded CO_2 emissions in the main CBAM sectors (iron & steel, aluminium, cement, fertilisers)

(European Commission, 2025). However, due to data limitations at the importer-level, this exemption *is not* applied in our revenue calculations (i.e. we do not remove small-volume import flows).

- Military exemption - Imports intended for use by Member States' armed forces or within NATO/CFSP cooperation are exempt from CBAM. These flows are not explicitly deducted in the projections due to the lack of sufficiently disaggregated data.
- EFTA exemption - Imports from Norway, Iceland, Liechtenstein, and Switzerland are treated as exempt, since these countries participate in or link to the EU ETS. This exemption *is* accounted for in the analysis.
- Electricity exemptions - Some technically integrated electricity markets (e.g. a future integrated grid with Ukraine) may be exempted under CBAM rules. We do not include this exemption in general, but we assume no imports of electricity from Ukraine to Poland in 2030 and 2035.

E. Calculation of CBAM certificates (modeling formula)

- To operationalise the CBAM obligation in our model, we use the following assumed (model) formula to compute the number of certificates to be surrendered for in (EU) country r in year t:

$$\text{Certificates}_{r,t} = \sum_{i,s} E_{i,s,r,t} \times F_t \times \max\left\{0, 1 - \frac{P_{s,t}}{P_t^{EU}}\right\}$$

where:

$E_{i,s,r,t}$ - Embedded emissions (tCO_2) of product i, imported from (non-EU) country s to (EU) country r in year t,

F_t - CBAM factor in year t (share of embedded emissions subject to CBAM),

P_t^{EU} - EU ETS allowance price in year t (EUR/tCO_2),

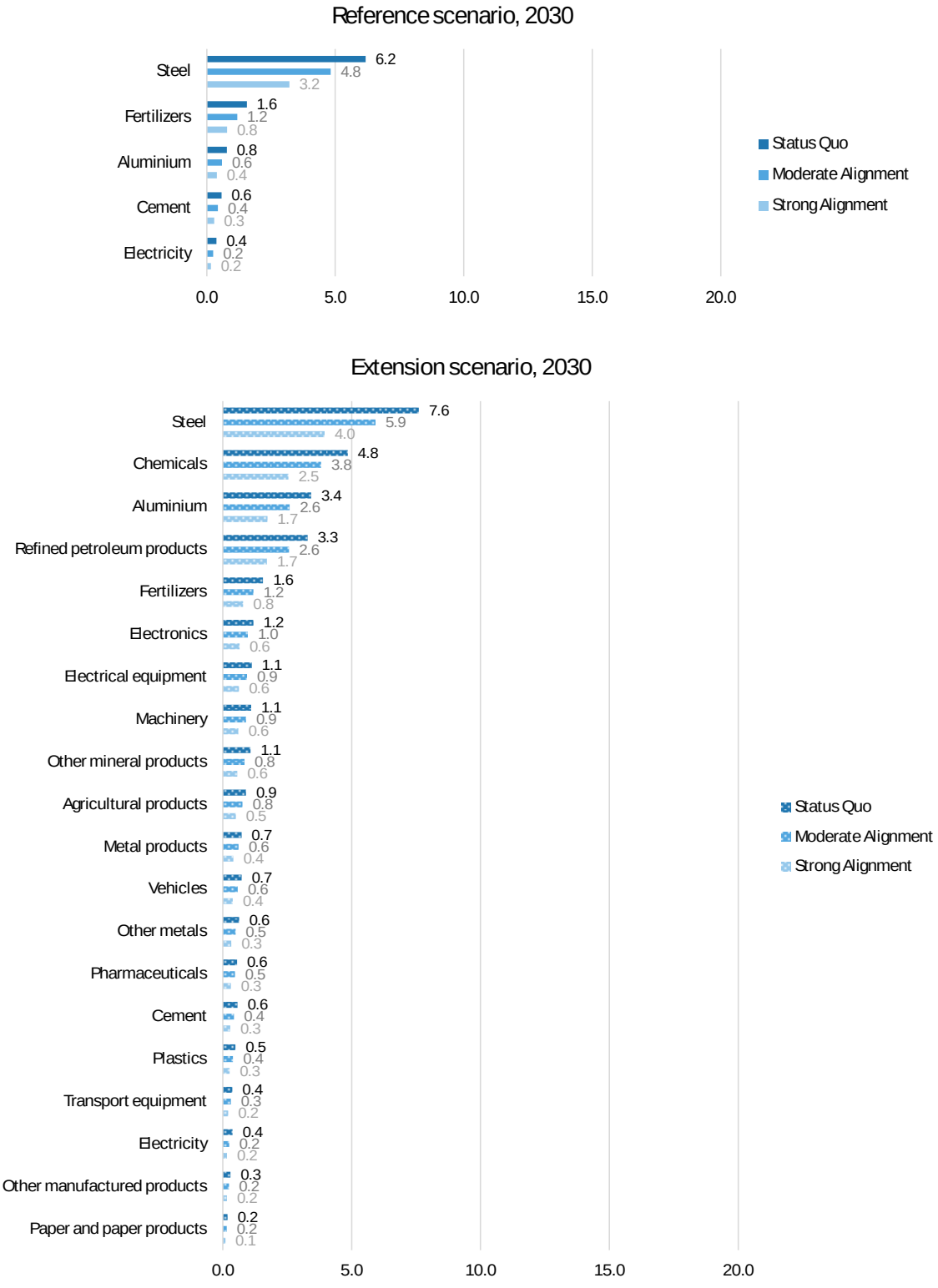
$P_{s,t}$ - effective foreign carbon price in country s in year t (EUR/tCO_2).

The corresponding CBAM revenue is: $\text{Revenue}_{r,t} = \text{Certificates}_{r,t} \times P_t^{EU}$.

- This expression is consistent with the Regulation's general logic (certificates proportional to embedded emissions, with crediting for carbon prices effectively paid abroad). However, the CBAM Regulation and implementing acts have not yet published an official formula for calculating the number of certificates. The expression used here is therefore a transparent modelling assumption for the purposes of scenario analysis.

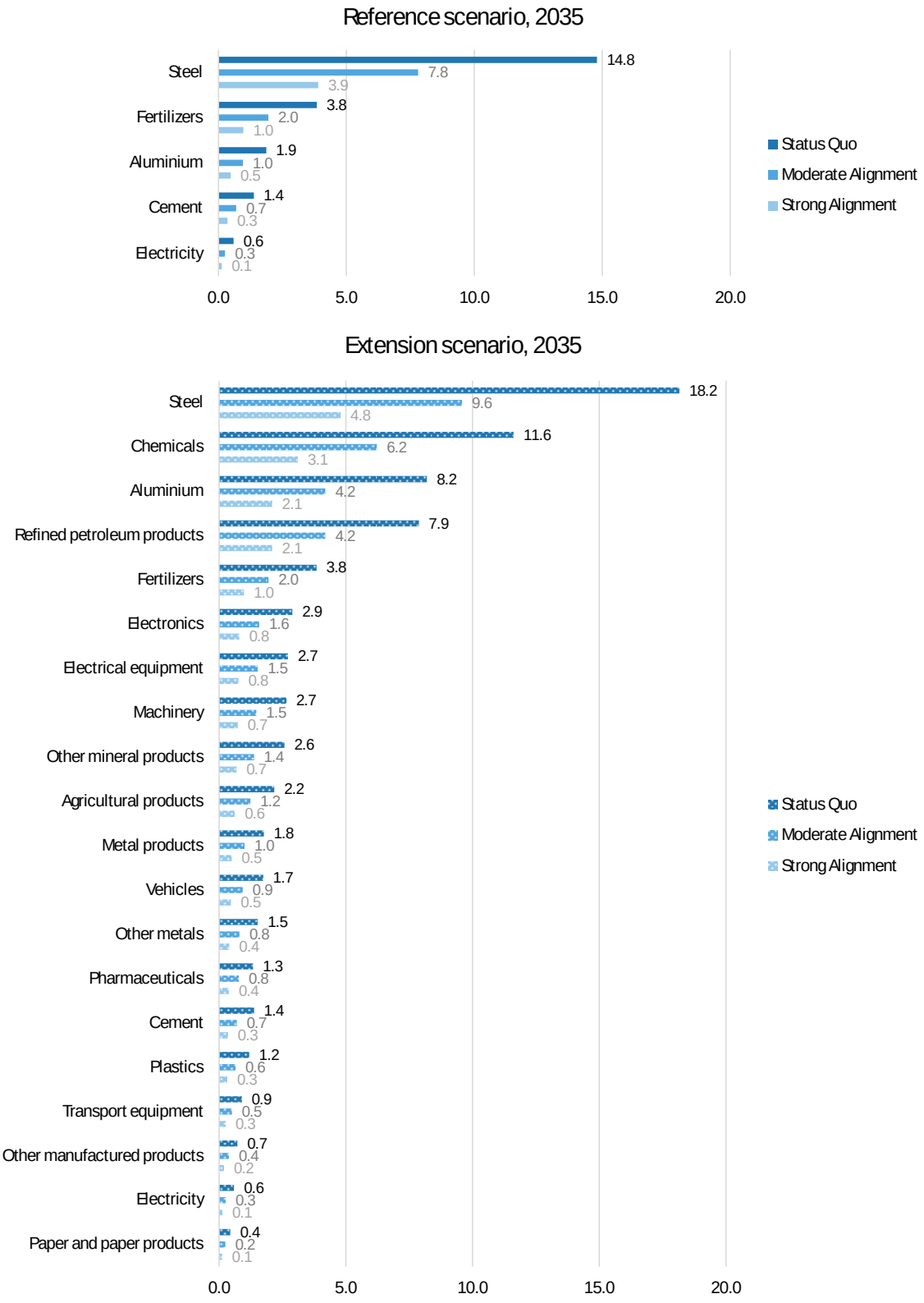
Annex II. Additional detailed results

Figure 14. Projected budgetary revenues from CBAM in the EU in 2030, by products (EUR billion, 2024 prices)



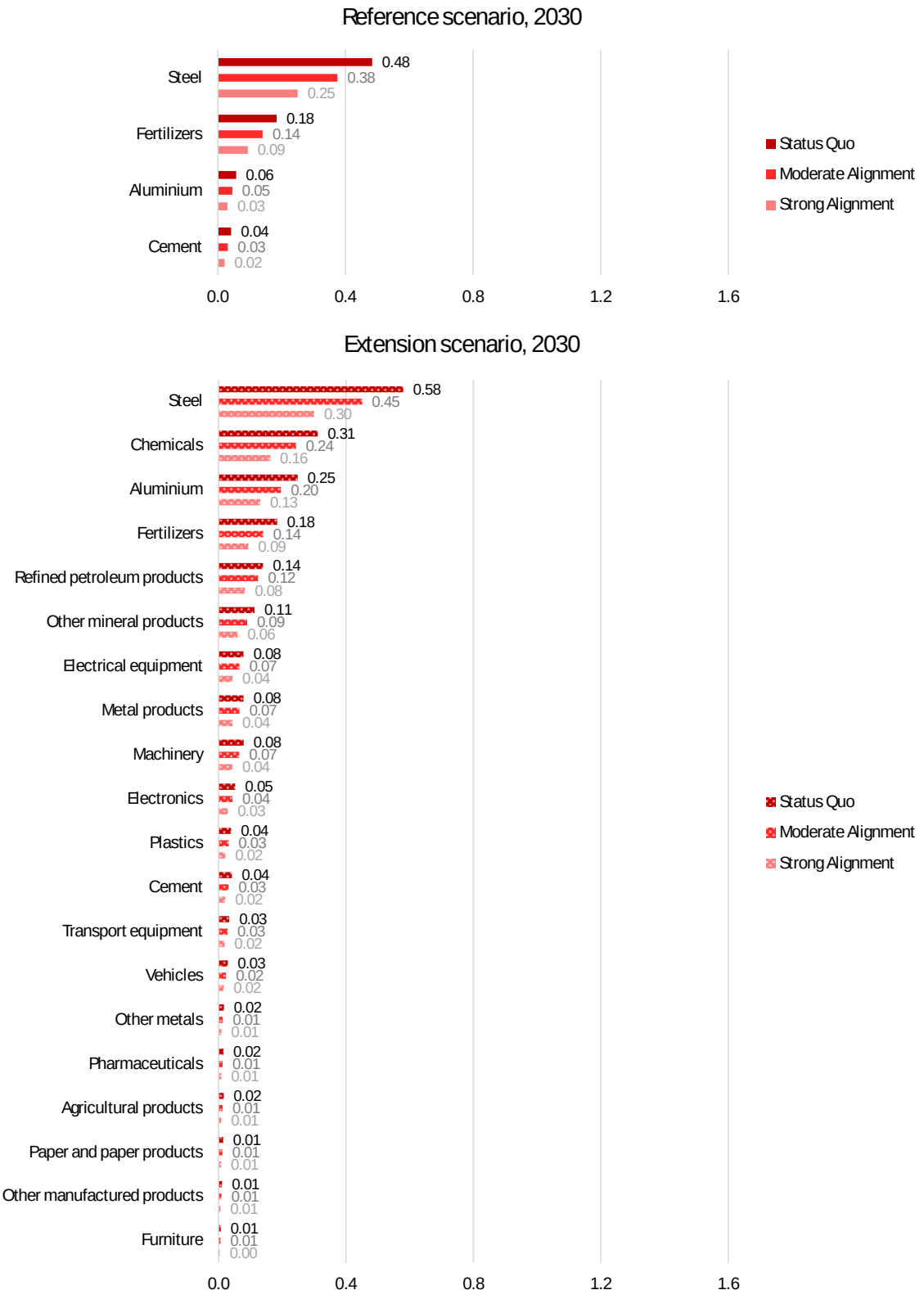
Based on **EU ETS prices** of **EUR 123**/tCO₂ (**2030**) and **EUR 147**/tCO₂ (**2035**), 2024 prices.
Source: CAKE/KOBiZE

Figure 15. Projected budgetary revenues from CBAM in the EU in 2035, by products (EUR billion, 2024 prices)



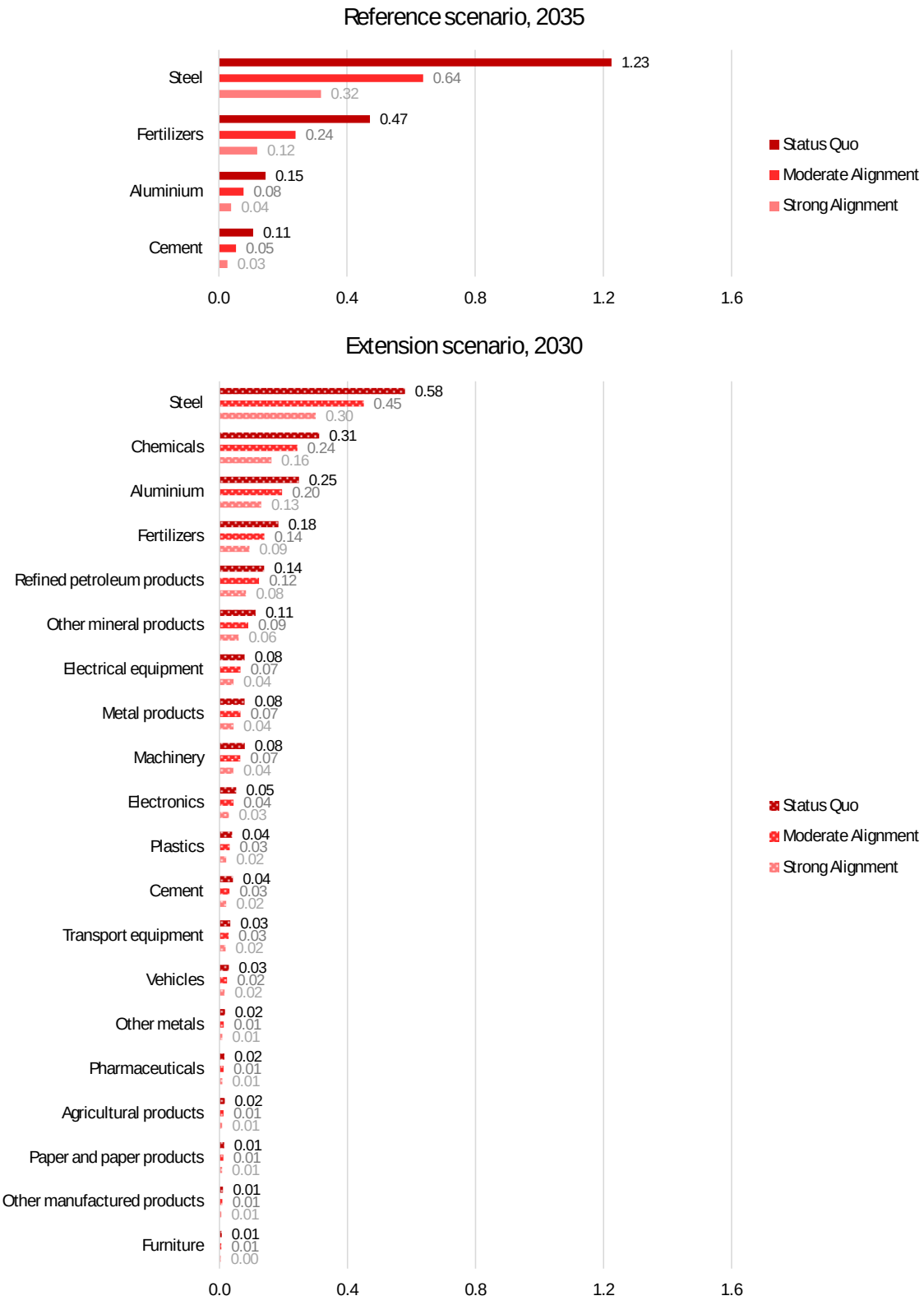
Based on **EU ETS prices** of **EUR 123**/tCO₂ (**2030**) and **EUR 147**/tCO₂ (**2035**), 2024 prices.
Source: CAKE/KOBiZE

Figure 16. Projected budgetary revenues from CBAM in Poland in 2035, by products (EUR billion, 2024 prices)



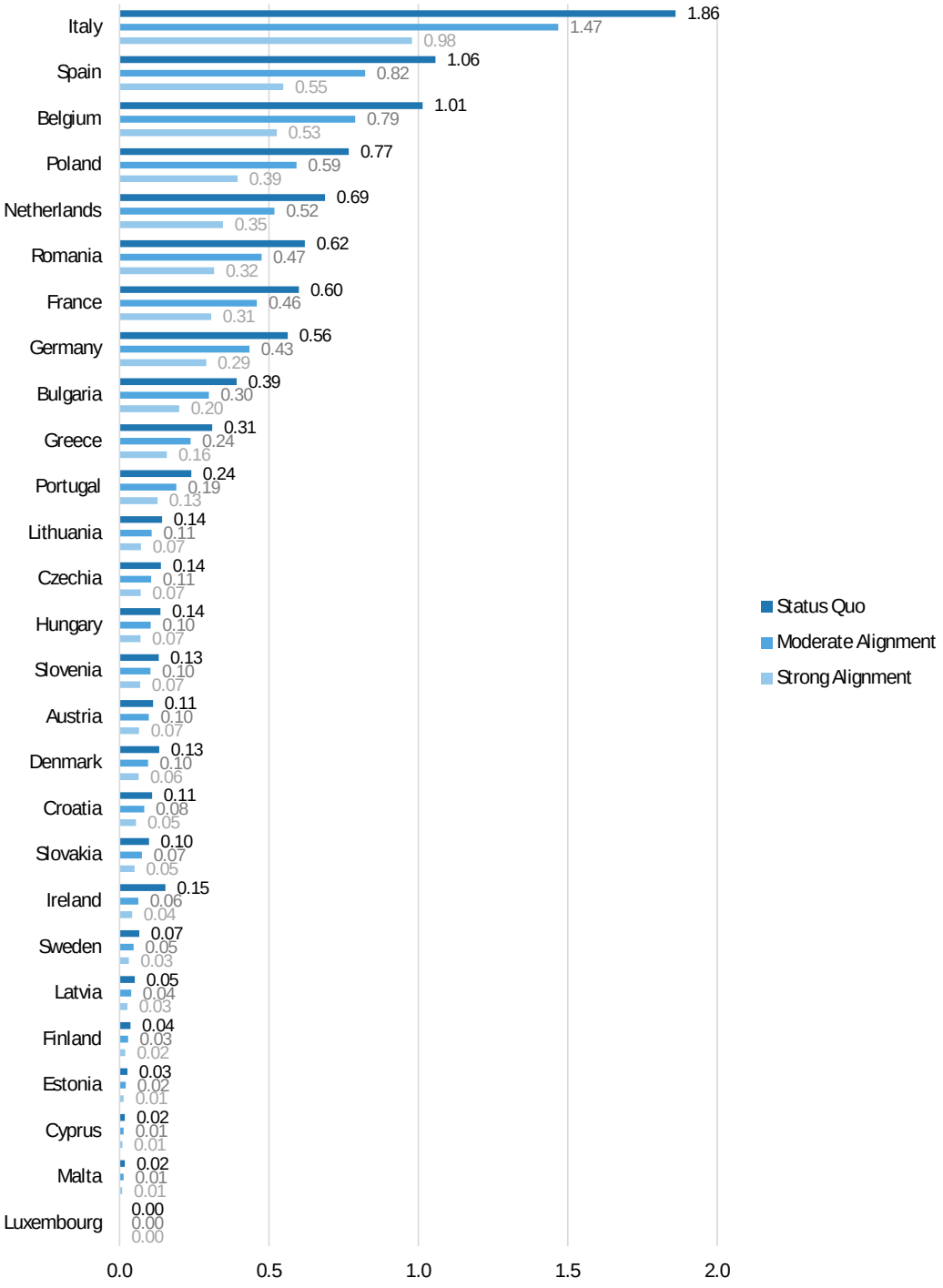
Based on **EU ETS prices** of **EUR 123**/tCO₂ (**2030**) and **EUR 147**/tCO₂ (**2035**), 2024 prices.
Source: CAKE/KOBiZE

Figure 17. Projected budgetary revenues from CBAM in Poland in 2035, by products (EUR billion, 2024 prices)



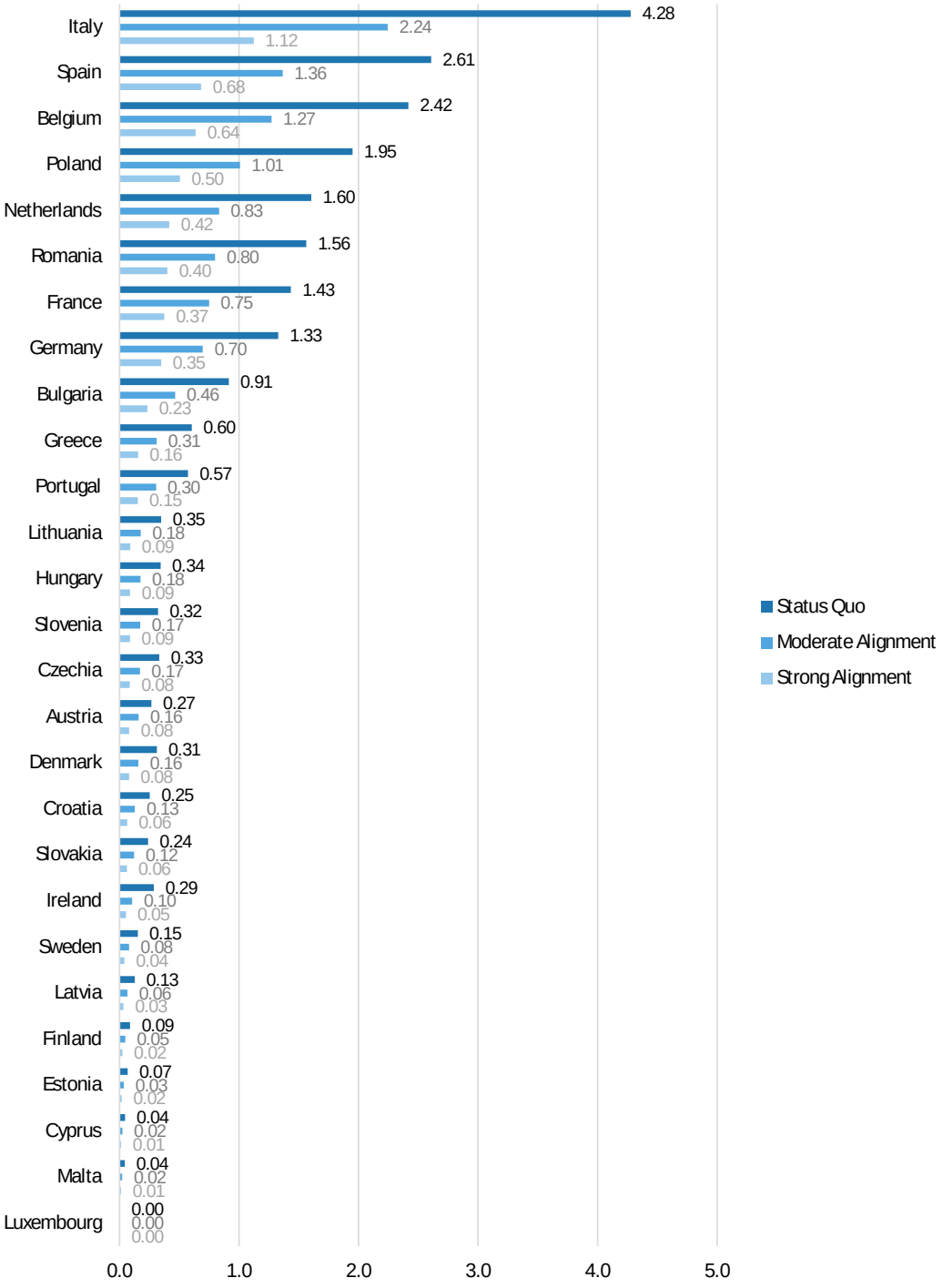
Based on **EU ETS prices** of **EUR 123**/tCO₂ (**2030**) and **EUR 147**/tCO₂ (**2035**), 2024 prices.
Source: CAKE/KOBiZE

Figure 18. Projected budgetary revenues from CBAM by EU Member State, Reference scenario, 2030 (EUR billion, 2024 prices)



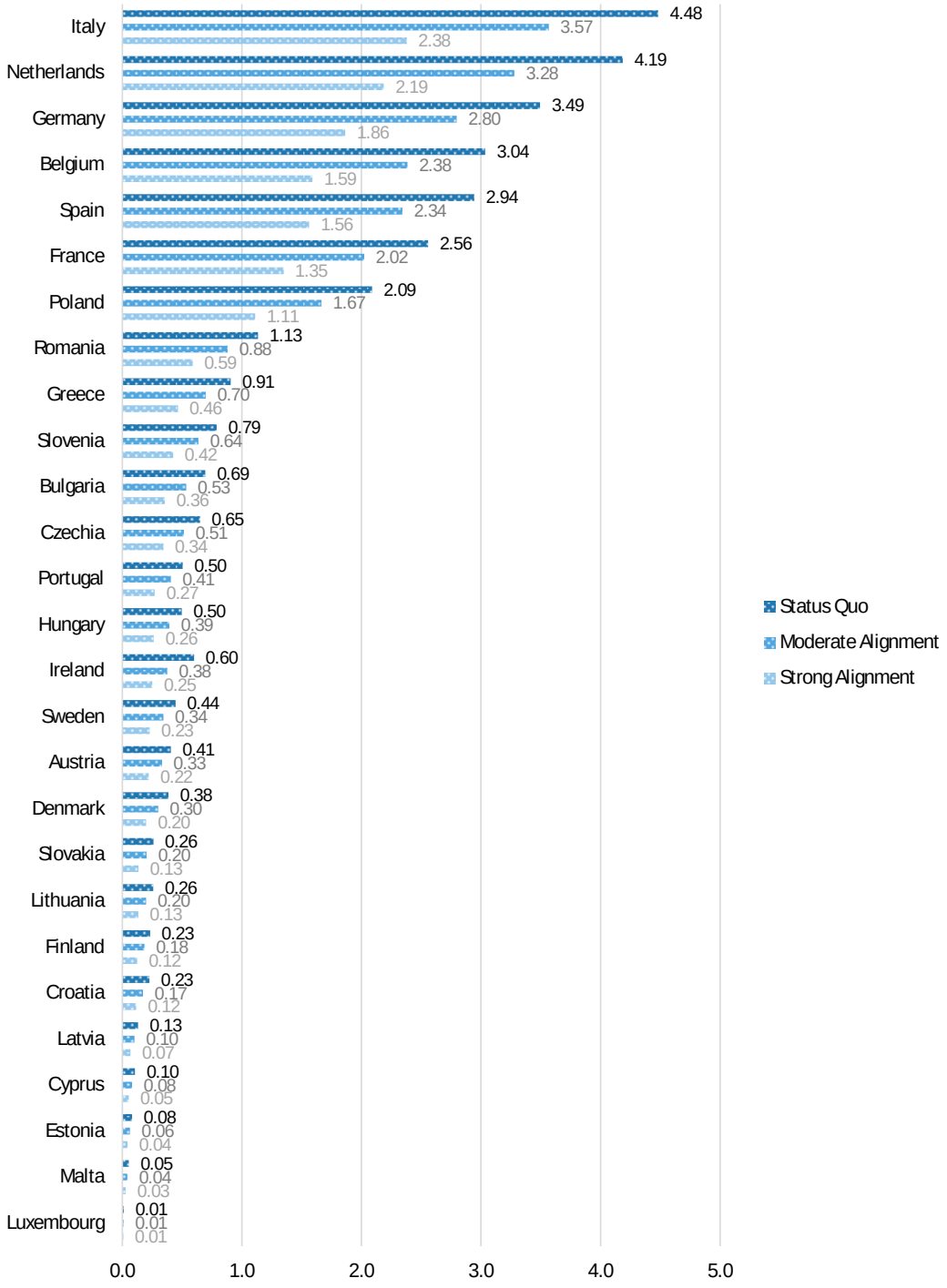
Based on **EU ETS prices** of **EUR 123**/tCO₂ (**2030**) and **EUR 147**/tCO₂ (**2035**), 2024 prices.
Source: CAKE/KOBiZE

Figure 19. Projected budgetary revenues from CBAM by EU Member State, Reference scenario, 2035 (EUR billion, 2024 prices)



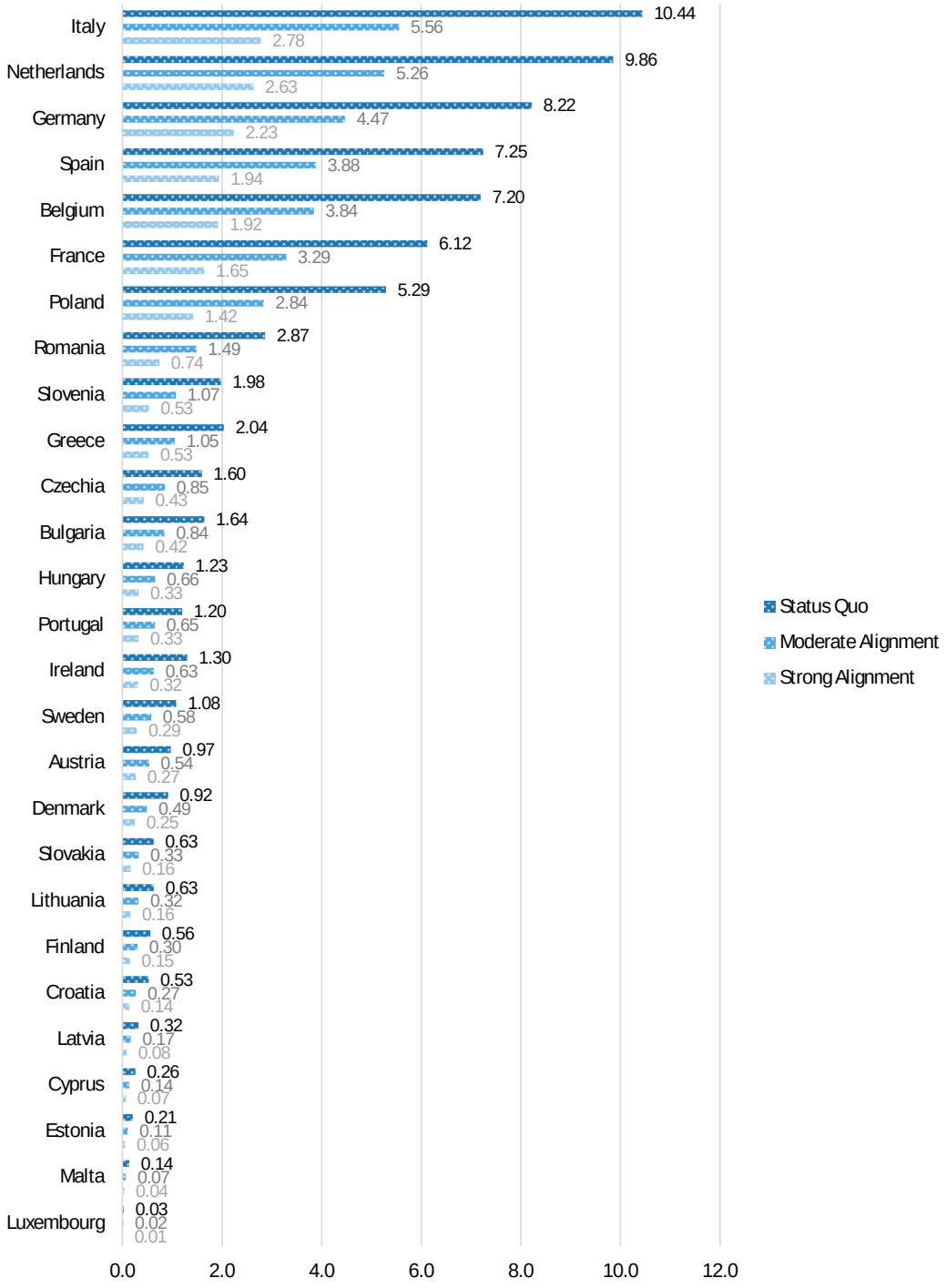
Based on **EU ETS prices** of **EUR 123**/tCO₂ (**2030**) and **EUR 147**/tCO₂ (**2035**), 2024 prices.
Source: CAKE/KOBiZE

Figure 20. Projected budgetary revenues from CBAM by EU Member State, Extension scenario, 2030 (EUR billion, 2024 prices)



Based on **EU ETS prices** of **EUR 123**/tCO₂ (**2030**) and **EUR 147**/tCO₂ (**2035**), 2024 prices.
Source: CAKE/KOBiZE

Figure 21. Projected budgetary revenues from CBAM by EU Member State, Extension scenario, 2035 (EUR billion, 2024 prices)



Based on **EU ETS prices** of **EUR 123**/tCO₂ (**2030**) and **EUR 147**/tCO₂ (**2035**), 2024 prices.
Source: CAKE/KOBiZE

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