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IMPACT ANALYSIS REPORT

Optimizing the CBAM De Minimis Threshold

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Executive Summary

The CBAM de minimis threshold determines which imports are small enough to be exempted from the mechanism's reporting and compliance obligations. In 2026 it changed from a €150-per-consignment value test to a cumulative threshold of 50 tonnes of CBAM goods per importer per year. This study asks, on empirical evidence, whether that threshold strikes the best available balance between administrative relief and environmental coverage, and how alternative designs would compare.

The analysis draws on a dataset of **63,405 import shipments** contributed by downstream manufacturers, principally in the automotive and machinery and equipment manufacturing sectors, covering the twelve months to September 2025. Six threshold designs are tested against this common dataset and judged on four measures: the share of embedded emissions retained in scope, and three distinct measures of administrative relief, being the shares of shipments, of importers, and of supplier relationships taken out of scope.

- The central finding is that administrative relief is multi-dimensional. A threshold can relieve the burden on importers or the burden that runs along the value chain (suppliers), and these are not the same. The current 50-tonne rule relieves importers well: it takes most of them out of scope while retaining 99.5 per cent of emissions. What it does not do is relieve the value chain: it leaves the great majority of supplier relationships in scope. A pair-based threshold does the reverse, relieving most relationships but less whole importers. Only the combined importer-and-pair design relieves both, exempting 56 per cent of importers and 74 per cent of relationships while holding 98.5 per cent of emissions. This matters because for every supplier relationship in scope, the third-country installation must determine and verify its embedded emissions, and that administrative cost rises as CBAM moves from default to actual emission values. The relief that a relationship-level threshold delivers, modest today, therefore grows more significant over time.
- The study's recommendation is to complement the current rule. The 50-tonne threshold performs its coverage and importer-relief functions well and should be retained; adding a relationship-level threshold of one tonne on top of it, the combined design, preserves that importer relief while extending relief to the value chain, at negligible cost to coverage. The pair-based threshold applied alone reaches a similar frontier with a simpler criterion. The choice between them is in part sectoral: the combined design suits concentrated downstream sectors of the kind studied here, while in more fragmented sectors, where most importers already fall below the 50-tonne rule, the pair-based threshold alone is the more relevant instrument.

These conclusions rest on downstream manufacturing data. The exact figures are specific to it; the ordering of the designs, however, follows from the shape of the import distribution rather than the sector, and is expected to hold more broadly. The precise calibration is left to the accompanying Policy Proposal.

1. Introduction & Context

1.1 The de minimis threshold in CBAM

The Carbon Border Adjustment Mechanism (CBAM) places a carbon cost on imports of certain goods into the European Union, matching the cost that EU producers already bear under the EU Emissions Trading System. In doing so it pursues two connected aims: to reduce the risk of carbon leakage[1], and to preserve a European level playing field between producers inside and outside the Union.

Like most reporting regimes, CBAM tempers these aims with a de minimis threshold: a rule that exempts sufficiently small imports from the obligation to report emissions and surrender certificates. Such a threshold removes from the system those imports whose contribution to the policy objective is negligible, and in doing so spares importers (smaller ones above all) an administrative effort that would otherwise stand out of proportion to the environmental benefit. The design of the threshold therefore determines how well the balance is struck between the objectives CBAM is meant to serve and the administrative burden it places on the economic actors within its scope.

1.2 Testing the threshold

The CBAM de minimis threshold has already been changed once. The original framework exempted consignments with an intrinsic value below €150; the 2025 simplification package[2] replaced this with a cumulative threshold of 50 tonnes of CBAM goods per importer per year, in force from 2026, with the declared aim of releasing a large number of small importers while keeping the great majority of embedded emissions within scope.

Whether that threshold represents the best available balance is the question this study examines. The 50-tonne rule is a considered calibration, and may well strike that balance effectively. However, it is recent, has yet to be tested against actual declaration data, and its performance relative to alternative or complementary designs is not yet established. The purpose of this study is not to presume it inadequate, but to test it on the evidence and, where the data suggests room to refine it, to identify how.

The question grows more pertinent as CBAM develops. The mechanism is also expected to widen over time, both in the range of goods it covers and in how far down manufacturing value chains it reaches. Each such extension places more weight on the de minimis rule and draws in a growing number of downstream importers, for whom CBAM goods are inputs to production rather than finished products.

[1] For a detailed definition and analysis of carbon leakage in the CBAM context, see A. Marcu et al., Carbon Leakage under CBAM and Free Allocation, ERCST, available at https://ercst.org/carbon-leakage-under-cbam-and-free-allocation/.

[2] https://eur-lex.europa.eu/eli/reg/2025/2083/oj/eng

1.3 Objective, scope and limits of the study

The study seeks to identify a de minimis threshold that holds the great majority of embedded emissions within CBAM's scope while removing administrative effort where it is least justified. It does so empirically, testing six threshold designs against a common dataset of import shipments from the fourth quarter of 2024 to the third quarter of 2025, and weighing, for each, the administrative relief obtained against the emissions coverage retained. It confines itself to observable quantities, shipments, weight, embedded emissions, and supplier relationships in scope, and does not model carbon leakage or decarbonization costs, which lie beyond its reach.

The dataset's value lies in what it represents: major downstream manufacturing sectors - principally automotive and machinery and equipment manufacturing - that import CBAM goods as inputs to their own production. These are the sectors on which CBAM's administrative burden increasingly falls, and towards which its scope is expected to move; bulk-commodity sectors such as cement and fertilizers, as well as hydrogen, are not represented. The findings should therefore be read as evidence of how the threshold designs behave for the downstream importers becoming central to CBAM, rather than as precise estimates for the mechanism as a whole. Section 5 returns to this point.

2. Background: Evolution of the De Minimis Rule

2.1 Historical Context

Where to draw the de minimis line under CBAM has been a live question since the mechanism was conceived, and the answer has already shifted significantly. In barely two years the threshold has moved from a value figure inherited from customs law to a mass-based annual exemption built around CBAM's own environmental logic, driven by practical experience during the transitional phase and by pressure to contain administrative burden.

The original CBAM Regulation, Regulation (EU) 2023/956[3], applied a per-consignment value threshold of €150, below which the mechanism did not apply to a shipment. The figure was not devised for CBAM: it was taken from the EU's standard customs-relief framework[4], where €150 is the value below which import duties are not collected[5], a threshold of commercial proportionality, not environmental significance.

Borrowing that threshold proved ill-suited to a carbon instrument, for a simple reason: a value threshold sorts imports by what they cost, not by what they emit. A high-value, low-mass

[3] https://eur-lex.europa.eu/eli/reg/2023/956/oj/eng

[4] https://eur-lex.europa.eu/eli/reg/2009/1186/oj/eng

[5] Note: The €150 customs relief the original CBAM threshold borrowed from (Reg. 1186/2009 Art. 23) was itself abolished EU-wide from July 1st 2026, due to widespread undervaluation and shipment-splitting. It was replaced by a flat €3 duty. https://eur-lex.europa.eu/eli/reg/2026/382/oj/eng

consignment could attract full obligations while a heavier, cheaper one carrying far more embedded carbon slipped through. And because the test applied shipment by shipment, an importer could divide a large consignment into several sub-€150 parts and bring in the same carbon untouched. The unit was measuring the wrong thing and could be gamed besides.

The transitional phase (October 2023 - December 2025) exposed these problems and prompted the Omnibus simplification. On 26 February 2025 the Commission presented the Omnibus I package, including a dedicated proposal to simplify the CBAM legislation[6]; the resulting Regulation (EU) 2025/2083 entered into force on 20 October 2025, amending Regulation (EU) 2023/956. The new threshold applies since the start of the definitive regime on 1 January 2026, with the €150 rule in force until then.

The €150 per-shipment trigger gave way to a single mass-based threshold of 50 tonnes of CBAM goods per importer per year: importers whose total annual imports do not exceed 50 tonnes are exempt from CBAM's core compliance obligations (authorisation, reporting and certificate surrender) though they must still note the exemption in the ordinary customs declaration. The exemption does not extend to electricity or hydrogen.

The redesign answers both faults of its predecessor at once. It is mass-based, so the exemption is anchored to a quantity that tracks embedded emissions rather than to price. And it is annual and cumulative: the 50 tonnes are assessed across all of a single importer's CBAM goods over the year, an importer bringing in 30 tonnes of steel and 25 of cement reaches 55 and falls into scope for all its imports, which removes any advantage from splitting shipments.

Crucially, the threshold is calibrated to an environmental target rather than a figure borrowed from elsewhere. On the Commission's own estimates[7] it exempts the vast majority of importers - predominantly SMEs and occasional importers - while retaining at least 99 per cent of the embedded emissions in imported CBAM goods, a level the Commission is set to review annually. In effect the legislator selected the highest exemption rate compatible with that coverage.

2.2 Calibrating the threshold

Correcting the unit was the harder half of the problem; setting the level is the other. The 50-tonne threshold is a single figure, applied uniformly to every importer regardless of sector, size, or product mix. That uniformity is its virtue (it is simple and predictable) but it is also the open question. A threshold calibrated to retain 99 per cent of emissions across today's importer population need not do so across a different one, and CBAM's population is set to change: as coverage extends further downstream, the shipment profiles of affected importers grow more varied, and a level tuned for the present mix may not strike the same balance in the future.

[6] https://taxation-customs.ec.europa.eu/news/officially-published-simplifications-carbon-border-adjustment-mechanism-cbam-2025-10-20_en

[7] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52025SC0058

Before turning to the data, two comparators help frame the question. The F-Gas Regulation (Section 2.3) shows how EU law has calibrated emissions-based thresholds elsewhere; the small-emitter exclusions in the EU ETS itself, under Articles 27 and 27a of Directive 2003/87/EC (Section 2.4), show how CBAM's own parent carbon-pricing framework handles the same trade-off between administrative relief and environmental coverage.

2.3 Comparative Analysis: Lessons from the F-Gas Regulation

The EU's regulatory experience with fluorinated greenhouse gases offers the closest precedent for emissions-based threshold design in EU climate law. Fluorinated greenhouse gases (commonly referred to as F-gases) are a family of synthetic gases used primarily as refrigerants, fire suppressants, and insulants in industrial and commercial equipment. They include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), Sulphur hexafluoride (SF_6), and nitrogen trifluoride (NF_3), and are characterized by global warming potentials that are typically hundreds to thousands of times greater than CO_2. Their production, use, and trade are governed at EU level by Regulation (EU) 2024/573[8] (the F-Gas Regulation), in force since 11 March 2024.

The F-Gas framework operates through a quota system rather than a tax or certificate mechanism, yet it faces an analogous design question: how to set the thresholds below which obligations fall away, without opening loopholes that undermine the environmental objective. The Regulation is explicit that de minimis thresholds should be drawn so as to avoid disproportionate administrative burden, in particular for micro-enterprises.

Unlike CBAM's mass-based threshold, the F-Gas Regulation takes CO_2-equivalent quantities as its primary unit throughout. Leak-checking obligations, for instance, are triggered once equipment contains 5 tonnes of CO_2e or more; equipment holding between 50 and 500 tonnes of CO_2e must be checked at least every six months, and equipment above 500 tonnes at least every three months. The architecture thus scales obligations to the actual environmental significance of the quantities involved, taking emissions as the unit at every step.

The Regulation also establishes a tiered compliance structure: baseline annual reporting applies to all producers, importers, and exporters, while third-party verification is reserved for the largest importers of pre-charged equipment. This pattern (universal basic reporting with heavier verification held back for larger actors) offers a model for how CBAM might likewise distinguish declaration obligations from enhanced verification according to the scale of imports.

Key lessons for CBAM threshold design

Three principles emerge with direct relevance to this study.

[8] https://eur-lex.europa.eu/eli/reg/2024/573/oj

The first is that emissions-based thresholds are operationally feasible within EU climate law. The F-Gas Regulation has used CO_2e quantities to differentiate regulatory obligations since its 2014 predecessor, which establishes the approach as administratively workable. Scenario 4 of this study - an emissions-based CBAM threshold - would therefore not be an original practice, but an alignment with established EU practice in the greenhouse-gas domain.

The second is that calibration should be anchored to environmental objectives rather than administrative convenience. The F-Gas quota volumes are calibrated to the EU's contribution to the Kigali Amendment phase-down trajectory, rather than to a figure imported from another regulatory domain. The original CBAM €150 threshold failed this test; the 50-tonne threshold does better, though it remains tied to a single coverage metric, without differentiation by sector, importer size, or product type. These very limitations this study sets out to examine.

The third concerns circumvention. The F-Gas experience with non-refillable containers and illegal bulk-HFC imports shows that threshold-based systems invite gaming at the margin: since 2015 the scale of illegal bulk-HFC imports, typically in non-refillable containers, has been significant enough to prompt dedicated countermeasures in Regulation (EU) 2024/573, including customs verification powers and enhanced digital controls. For CBAM the lesson bears on the choice of unit. The scenarios that judge each shipment on its own (Scenario 5 (consignment weight) and Scenario 1 (value)) are the most exposed to artificial splitting. The cumulative designs are far more resistant: by aggregating an importer's activity across the year, as in Scenario 2, they leave nothing to be gained from dividing shipments. The pair-based designs, Scenarios 3 and 6, inherit most of that resistance but retain a subtler exposure, since an importer could spread a single supplier relationship across several supplier identities to keep each below the pair threshold, a possibility the study returns to in Section 5.

2.4 Comparative Analysis: Lessons from EU ETS Articles 27/27a

CBAM's parent framework offers a comparator closer to home than F-Gas. Directive 2003/87/EC[9] (which established the Emissions Trading System that CBAM is designed to mirror at the border) contains two small-emitter exclusions of its own.

Article 27 allows Member States to exclude installations reporting annual emissions below 25,000 tonnes of CO_2 equivalent (and for combustion installations, a rated thermal input below 35 MW) from the ETS, provided the installation remains subject to national measures achieving an equivalent contribution to emission reductions, and to monitoring and notification conditions. Article 27a extends a further exclusion to installations emitting below 2,500 tonnes of CO_2 equivalent, the so-called ultra-small-emitter exemption. Both provisions answer to the same logic this study applies to CBAM: the costs of monitoring, reporting, and verification fall disproportionately on small emitters relative to their environmental significance.

One feature sets these exclusions apart from both the F-Gas thresholds and CBAM's own 50-tonne rule. Exclusion under Article 27 is conditional rather than unconditional: it is available

[9] https://eur-lex.europa.eu/eli/dir/2003/87/2024-03-01/eng

only where the excluded installation remains subject to equivalent domestic measures delivering comparable emission reductions. CBAM's de minimis threshold, by contrast, removes exempted importers from the system altogether, with no substitute obligation.

3. Methodology

3.1 Data Sources and Contributors

The empirical analysis draws on anonymized, declaration-level import data contributed voluntarily by three industry associations whose members are active importers of CBAM-covered goods:

- the European Automobile Manufacturers' Association (**ACEA**);
- the German Machinery and Equipment Manufacturing Industry Association (**VDMA)**;
- the European Association of Automotive Suppliers (**CLEPA**).

The data was collected through a standardized template developed by ERCST, which specified the required fields for each declaration: the declaration date, an anonymized importer identifier, an anonymized supplier identifier, the net weight of the shipment (in tonnes), its value (in euros), and its embedded emissions (in tCO_2), together with a flag indicating whether actual or default emission factors were used. No company names, installation names, or other identifying information were collected or retained, and all analysis is conducted on the aggregated, anonymized dataset.

3.2 Dataset Overview

The combined dataset covers a full twelve-month period, from 1 October 2024 to 30 September 2025, a complete annual cycle, and therefore the natural unit against which the cumulative, annually-assessed thresholds are evaluated. It comprises 63,405 individual import shipments, submitted by 169 distinct importer (legal-entities) codes across the 33 contributing companies.

Across these shipments, the dataset captures 169,524 tonnes of net import weight and 437,142 tonnes of embedded CO_2. The total declared shipment value is approximately EUR 480 million. The shipments involve 2,271 distinct suppliers and 2,954 distinct importer-supplier pairs, and cover goods from a range of countries of origin.

The dataset is concentrated. The ten largest importers, by number of shipments, account for approximately 63 per cent of all shipments. Moreover, embedded emissions are more concentrated still, a feature examined in Section 4.3, and one that directly matters for how each scenario's results should be read.

3.3 The six Scenarios

The study tests six threshold designs. Each defines a different rule for deciding whether a given importer, shipment, or importer-supplier relationship falls below the de minimis line and is therefore exempt from CBAM obligations. The first five correspond to the different design

options set out in this section; the sixth combines two of them, for reasons explained below. All are modelled at the central threshold values in Table 2, which are only indicative as each is also tested across a range of values in the **sensitivity analysis (Section 4.2)**.

- ***Scenario 1*** **- Value per consignment (€)**

A shipment is exempt if its declared value is below €150. This replicates the original CBAM de minimis threshold as it applied during the transitional phase (October 2023 - December 2025), taken directly from the EU's general customs-relief framework. The exemption is assessed on the individual consignment and does not aggregate across shipments or across the year.

- ***Scenario 2*** **- Cumulative weight per importer (tonnes per year - current rule)**

An importer is exempt if the total net weight of CBAM goods it imports for the year, across all consignments and product types, does not exceed 50 tonnes. This is the current rule, introduced by Regulation (EU) 2025/2083 and applying from 1 January 2026. The threshold is assessed annually and cumulatively: all of an importer's CBAM activity is aggregated before the exemption is applied.

- ***Scenario 3*** **- Weight per importer-supplier pair (tonne per year)**

A declaration is exempt if the total net weight imported from a given supplier by a given importer over the year does not exceed 1 tonne. The unit of assessment is the individual trading relationship rather than the importer as a whole, so a large importer can have some relationships exempt and others in scope, depending on the volume traded with each. This is the design that most closely mirrors the installation-level logic of EU ETS Articles 27 and 27a.

- ***Scenario 4*** **- Emissions-based threshold (tCO_2 per year)**

An importer is exempt for the year if the total embedded emissions of all the CBAM goods it imports do not exceed 4,000 tCO_2. Using CO_2-equivalent quantities as the compliance unit has precedent in EU climate regulation, notably the F-Gas Regulation (Section 2.3); the specific value is calibrated to the CBAM context and explored across alternatives in the sensitivity analysis.

- ***Scenario 5*** **- Consignment weight (tonnes per shipment)**

A declaration is exempt if the net weight of that individual consignment does not exceed 3 tonnes. As in Scenario 1 the exemption is assessed per shipment, but the metric is physical mass rather than value, which ties it more directly to embedded emissions.

- ***Scenario 6*** **- Combined importer and pair test (tonnes)**

A declaration is in scope only where the importer exceeds the 50-tonne annual threshold and the specific importer-supplier relationship exceeds 1 tonne; If either condition is not met, the declaration is exempt: if either the importer stays under the 50-tonne annual threshold OR the specific importer supplier relationship does not exceed 1 tonne. Scenario 6 is not a further single-dimension option but a synthesis of Scenarios 2 and 3, and it is included because each of those has a blind spot the other covers. The importer-level rule (S2) can exempt a small importer even where it runs a single large, emissions-heavy supplier relationship; the pair-level rule (S3) can pull a major importer into scope over a trivial relationship. Requiring materiality on both dimensions at once - a substantial importer and a non-trivial relationship - tests whether a combined rule isolates the genuinely low-value administrative steps more precisely than either threshold alone.

Table 1:Scenario definitions and central threshold values

#	Scenario	Rule for exemption	Unit of assessment	Central threshold
S1	**Value per consignment**	Declared value below the threshold	Individual consignment	€150
S2	**Cumulative weight per importer**	Importer's total annual net weight at or below the threshold	Importer (annual, cumulative)	50 tonnes / year
S3	**Weight per importer-supplier pair**	Pair's total annual net weight at or below the threshold	Importer-supplier relationship (annual)	1 tonne / year
S4	**Cumulative emissions per importer**	Importer's total annual embedded emissions at or below the threshold	Importer (annual, cumulative)	4,000 tCO_2 / year
S5	**Consignment weight**	Consignment net weight at or below the threshold	Individual consignment	3 tonnes
S6	**Combined importer + pair**	In scope only if importer > 50 t and pair > 1 t; exempt if either is at or below	Importer and Importer-Supplier relationship (annual)	50 tonnes + 1 tonne

3.4 Evaluation Criteria

Each scenario is evaluated against four metrics:

- **Emissions coverage (tCO_2, %):** the share of embedded emissions that remain in scope, carried by the shipments still above the threshold. This is the main measure of environmental integrity. The Commission's target for the current 50-tonne rule is at

least 99 per cent coverage, which the study uses as a reference point rather than a fixed constraint.

- **Shipments exempted (#, %):** the share of shipments that fall below the threshold and drop out of the CBAM population. This is the broadest measure of relief, capturing the volume of import activity lifted out of the system.
- **Importers exempted (#, %):** the share of importers taken wholly out of scope, counting an importer as exempted only where none of its shipments remain liable. This is the measure of relief that matters most at the level of the obligated entity: an importer with even one liable shipment must still register as a CBAM declarant, calculate emissions, file the annual declaration and surrender certificates, so it obtains no real relief until it leaves the system entirely. It is also the metric the Commission uses to assess the current rule.
- **Suppliers exempted (#, %):** the share of distinct suppliers, or, for the pair-based designs, importer-supplier relationships, taken out of scope. This captures relief along the value chain: every relationship still in scope obliges not only the importer to report, but the relevant third-country installation to determine and verify its embedded emissions. A threshold that retains a high share of emissions while leaving many relationships in scope spreads compliance cost across the supply chain, not just onto the importer.

The three relief metrics are deliberately distinct, because a threshold can relieve one kind of burden while leaving another untouched: a rule may exempt many importers but few of their supplier relationships, or the reverse. Reading them together is what reveals how each design actually distributes relief.

3.5 Characteristics of the Data

The most important characteristic is sectoral: the data comes from downstream manufacturing (automotive and machinery and equipment manufacturing), not from bulk-commodity sectors such as cement or fertilizers, so the quantitative results are specific to these sectors. Section 5.2 examines why the ranking of the designs is nonetheless expected to generalize.

A second characteristic of the data is the reporting window. A single twelve-month period is the natural unit for testing annual, cumulative thresholds, but it cannot show year-to-year variation; a design that performs well over this year may behave differently across several.

The third is the unit of assessment in the pair-based scenarios. CBAM's obligations ultimately attach to the production installation, but the data identifies suppliers, so Scenarios 3 and 6 treat the importer-supplier relationship as a proxy. Since one supplier may run more than one installation, the proxy is close but not exact and understates the number of installations engaged.

A small number of records were also set aside in cleaning where their format or values could not be reconciled, and a few shipments lack an individual field. Together these affect a negligible share of the dataset and do not bear on the results.

4. Results: The Six Scenarios

4.1 Baseline results across the six scenarios

Table 2: Baseline results across the six scenarios (central thresholds)

#	Scenario	Threshold	Emissions covered (%) *(good if high)*	Shipments exempted (%) *(good if high)*	Importers exempted (%) *good if high*	Suppliers exempted (%) *(good if high)*
S1	**Value per consignment**	€150	**93.9%**	**39.8%**	**9.5%**	**27.5%**
S2	**Cumulative weight / importer (Current)**	50 t / yr	**99.5%**	**8.4%**	**53.8%**	**9.5%**
S3	**Weight / importer-supplier pair**	1 t / yr	**99.0%**	**19.9%**	**28.4%**	**70.5%***
S4	**Cumulative emissions / importer**	4,000 tCO_2	**89.5%**	**51.0%**	**91.7%**	**56.6%**
S5	**Consignment weight**	3 t	**88.9%**	**91.5%**	**45.6%**	**86.2%**
S6	**Combined importer + pair**	50 t + 1 t	**98.5%**	**25.8%**	**55.6%**	**74.0%***

**In-scope share for S3 and S6 is measured as distinct importer-supplier pairs; for all other scenarios as distinct suppliers. Percentages are taken over each scenario's assessed shipments. Source: study model, Cross-Scenario Results.*

Please note: The central threshold values are not essential to reading the results. Each was chosen either because it corresponds to an actual or former legislative figure (€150 for the value threshold and 50 tonnes for the cumulative importer threshold) or, as a representative value near the middle of the range tested. The baseline results below should therefore be read as an indication of how each design behaves at a reasonable setting, not as a verdict tied to one number; the **sensitivity analysis** that follows traces how the results move as each threshold is varied across its full range.

At their central threshold values, the six scenarios produce sharply different combinations of emissions coverage and administrative relief. **Table 2** reports each against four metrics: one measure of coverage, and three of relief, being the share of shipments, of importers, and of supplier relationships taken out of scope. The three relief measures are the key to reading the table, because they diverge: a design can relieve one kind of burden while leaving another almost untouched. The discussion below reads the table on that basis.

The current rule relieves importers, not the value chain. Scenario 2, the 50-tonne cumulative rule now in force, retains 99.5 per cent of embedded emissions and takes 53.8 per cent of importers out of scope. On the measure the Commission itself uses to assess the rule, the number of importers exempted, it is well targeted: it removes the small importers from the

system while holding almost all emissions. What it does not do is relieve the value chain: only 9.5 per cent of supplier relationships fall out, because the many importers that remain in scope must still document each of their suppliers. It also exempts few shipments (8.4 per cent), since shipment volume is concentrated in the large importers it keeps in. The rule is therefore not poorly calibrated; it is calibrated for one dimension of relief, the importer, and largely silent on the others.

The importer figure invites comparison with the Commission's own. The Commission's impact assessment[10] finds that the 50-tonne rule exempts around 91 per cent of importers while retaining 99 per cent of emissions; this study finds 53.8 per cent. The difference is one of population. The Commission measures the entire EU importer base, which is dominated by very small and occasional importers, the median importing little more than a thousand euros of CBAM goods a year, almost none of whom appear in this dataset of large downstream manufacturers. Both figures describe the same rule doing the same thing: exempting the small, retaining the large. That the exemption rate is lower here simply reflects that this dataset is close to the population the rule keeps in scope.

The relationship-based designs relieve the value chain, and the combined test relieves both. The pair threshold (S3) is the mirror image of the current rule: it exempts 70.5 per cent of supplier relationships but only 28.4 per cent of whole importers, because a large importer keeps at least one relationship above the tonne and so stays in the system. It strips out the small relationships each importer must document while leaving the importers themselves in scope. The combined test (S6) is the only strong design on both counts: it exempts 55.6 per cent of importers and 74.0 per cent of relationships, at 98.5 per cent coverage. It leads on no single relief measure, but it is the only design without a weak one, and it holds coverage within a point of the current rule.

The remaining designs buy relief at the cost of coverage. The value threshold (S1) exempts 39.8 per cent of shipments but retains only 93.9 per cent of emissions, since value bears little relation to carbon content, and it relieves few importers (9.5 per cent). The importer-emissions threshold (S4) exempts the most importers of any design, 91.7 per cent, as most importers fall under a 4,000-tonne annual emissions cap, but at a real coverage cost, holding only 89.5 per cent of emissions. The consignment threshold (S5) exempts the most shipments (91.5 per cent) and supplier relationships (86.2 per cent) of any design, but holds the least emissions (88.9 per cent), through a per-shipment test that is also the most open to circumvention.

Two findings run through the table. First, relief is multi-dimensional: the current rule and the pair rule each relieve one kind of burden and neglect another, and only the combined test relieves importers and the value chain together. Second, relief and coverage are not in simple opposition; the designs that assess imports cumulatively and at the level of the trading

[10] European Commission, Impact Assessment accompanying the CBAM simplification proposal, SWD(2025) 58, 26 February 2025.

relationship obtain substantial relief at almost the current rule's coverage, whereas the per-shipment and value-based designs give up coverage as they exempt more.

4.2 Sensitivity to the threshold value

The baseline results hold at single threshold values; the sensitivity analysis tests how each metric responds as those values move. The scenarios are presented in turn (Figures 1–6b), each plotting the four metrics against its threshold.

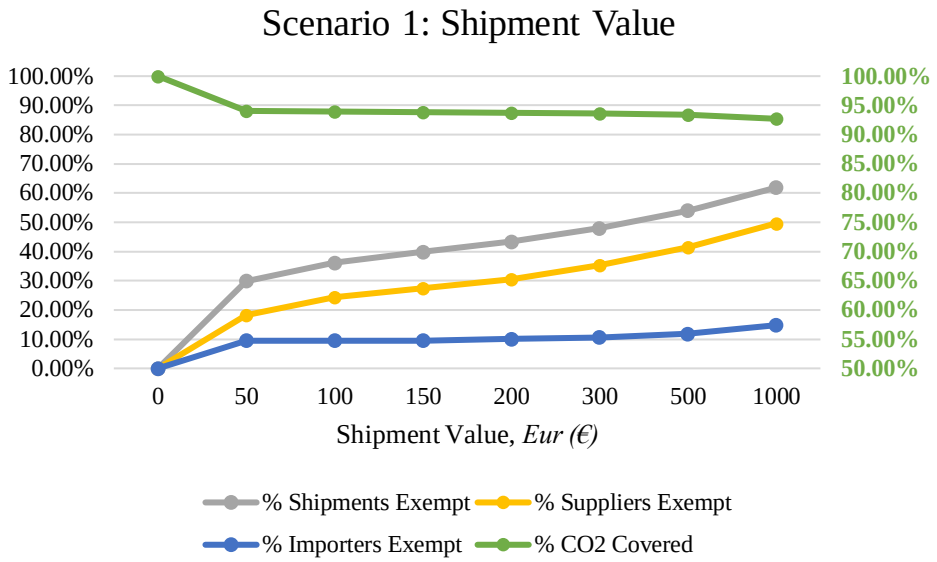


Figure 1: Scenario 1 (value) — metric response across €50–€1,000

Scenario 1 - value (*Figure 1*). As the threshold rises from €50 to €1,000, shipment exemptions climb from 30 to 62 per cent, yet coverage barely moves, from about 94 to 93 per cent. That near-flat coverage line is the finding: a value threshold screens out transactions, not emissions, so raising it exempts more shipments without changing how much carbon stays in scope. It barely relieves importers at all, with importer exemptions rising only from about 10 to 15 per cent across the whole range, because value seldom takes a whole importer out of scope.

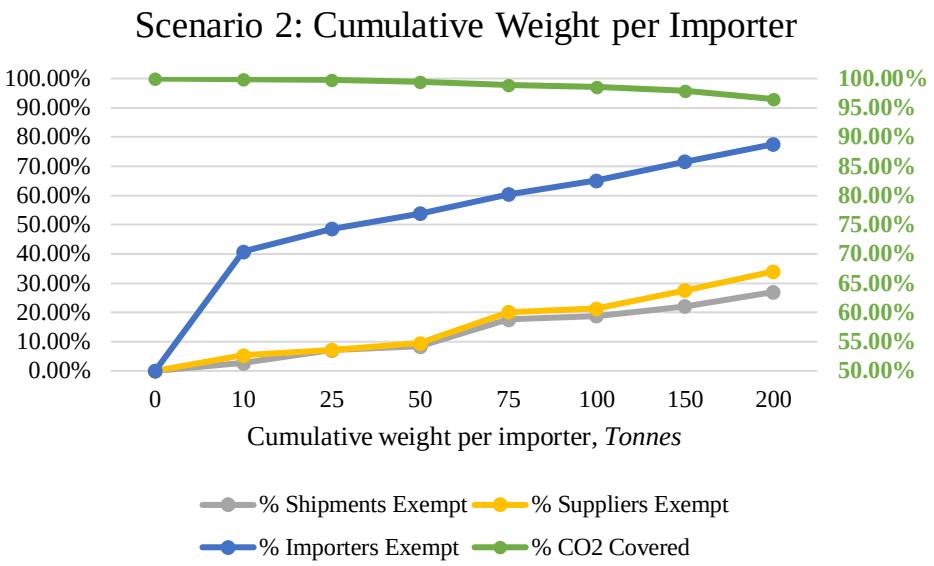


Figure 2:Scenario 2 (cumulative weight per importer) — 10–200 t

Scenario 2 - cumulative weight per importer (*Figure 2*). Coverage remains very high across the entire range, falling only from 99.9 to 96.5 per cent as the threshold rises from 10 to 200 tonnes, four times the current level, while shipment exemptions rise modestly from 3 to 27 per cent. Where the design does move is on importers: importer exemptions climb from 41 to 78 per cent, confirming that the importer is the dimension this rule relieves. Supplier relationships, by contrast, stay largely in scope throughout. The design is robust because the large importers that dominate emissions stay in scope; the step between 50 and 75 tonnes, where shipment exemptions jump from 8 to 18 per cent, reflects the way importers cluster around that size.

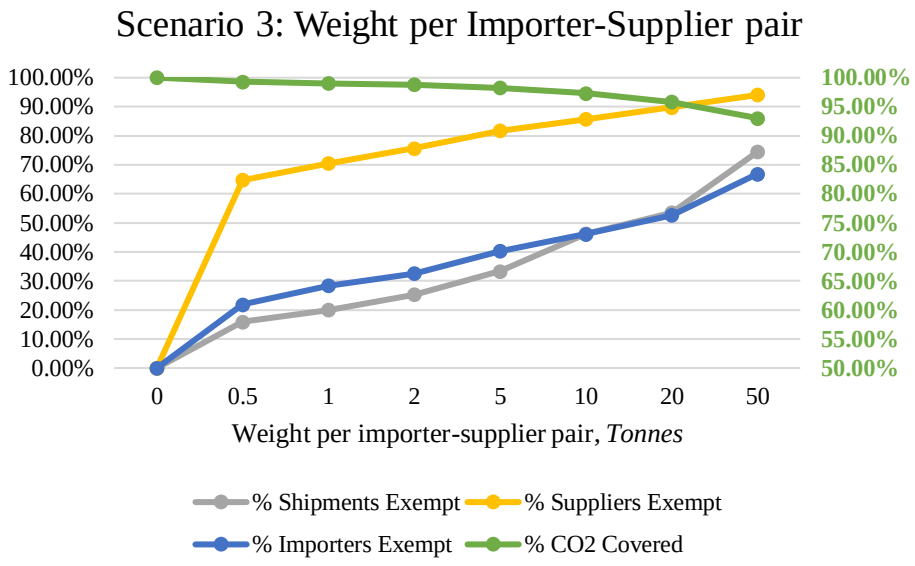


Figure 3: Scenario 3 (weight per importer-supplier pair) — 0.5–50 t

Scenario 3 - weight per importer-supplier pair (*Figure 3*). Coverage holds above 98 per cent up to a 5-tonne threshold, by which point shipment exemptions have reached a third, and stays above 93 per cent even at 50 tonnes. Exempt relationships rise faster than in any other design, from 65 per cent at half a tonne to 94 per cent at 50, while importer exemptions rise more slowly, from 22 to 67 per cent, staying below the current rule's importer relief across much of the range. The pair rule can therefore be loosened well beyond its central tonne with little cost to coverage and a large gain in value-chain relief, though it relieves whole importers less than the importer-based rules do.

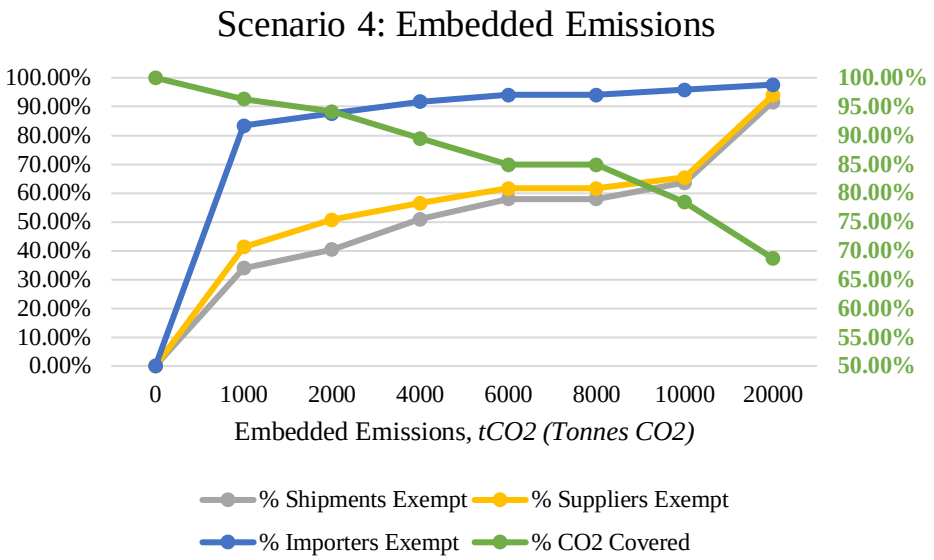


Figure 4: Scenario 4 (cumulative emissions per importer) — 1,000–20,000 tCO_2

Scenario 4 - cumulative emissions per importer (*Figure 4*). Coverage falls steadily as the threshold rises, from 96 per cent at 1,000 tCO_2 to 69 per cent at 20,000, because raising an importer-level emissions cap releases whole importers, and the emissions attached to them, at once. It exempts more importers than any other design, from 83 per cent already at 1,000 tCO_2, but that is precisely the problem: the importers it releases carry real emissions. It is the least robust of the six, its coverage responding almost linearly to the threshold with no plateau to settle on.

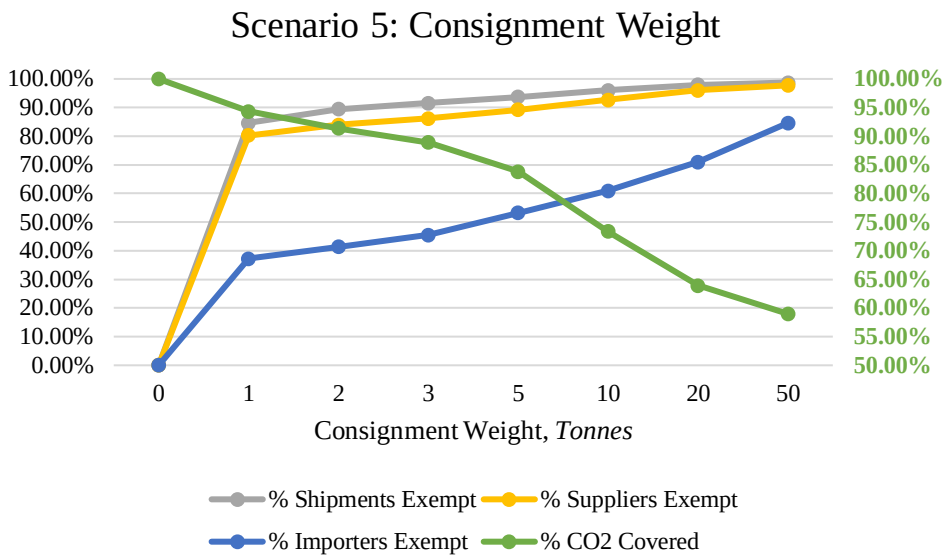


Figure 5: Scenario 5 (consignment weight) — 1–50 t

Scenario 5 - consignment weight (*Figure 5*). Shipment exemptions start high and climb further, from 85 per cent at 1 tonne to 99 per cent at 50, and exempt relationships stay very high throughout (above 80 per cent), but coverage falls quickly alongside them, from 94 to 59 per cent. Assessed shipment by shipment, the design sheds coverage rapidly as the threshold is relaxed and offers no robust setting.

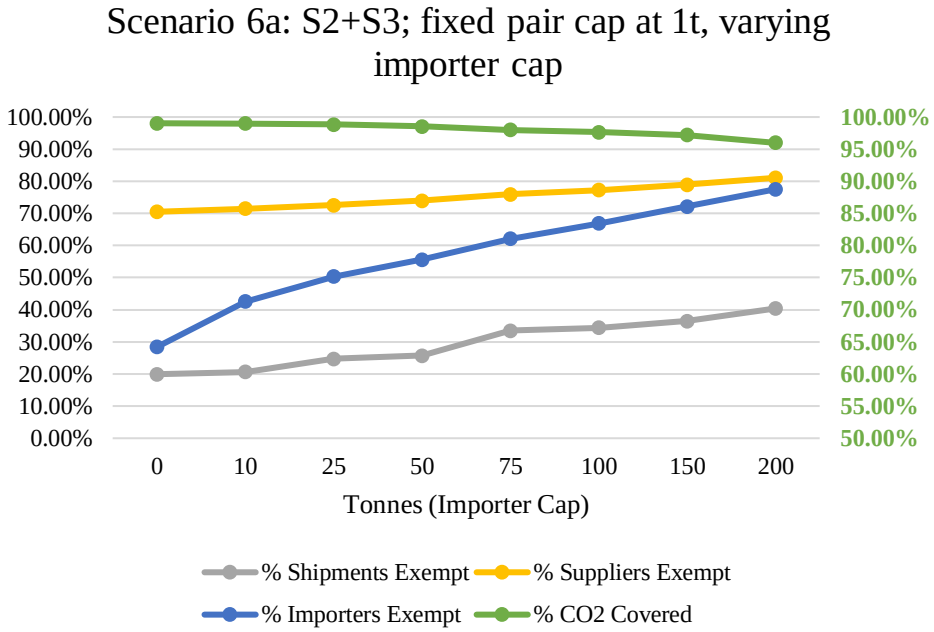


Figure 6a: Scenario 6a — varying the importer cap (pair held at 1 t)

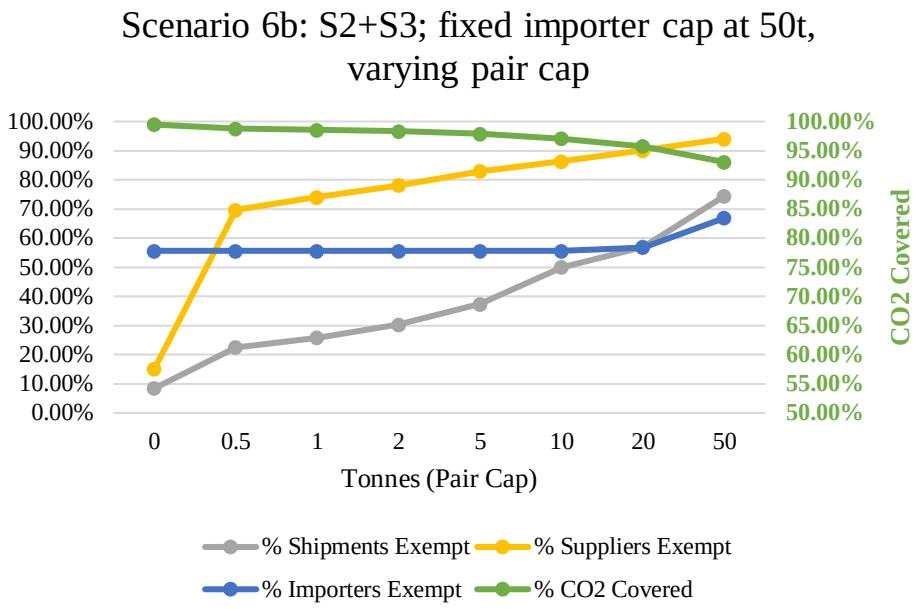


Figure 6b: Scenario 6b — varying the pair cap (importer held at 50 t)

Scenario 6 - combined importer and pair test (*Figures 6a and 6b*)[11]. With two thresholds, each is varied in turn. Holding the pair cap at 1 tonne and raising the importer cap (*Figure 6a*) has only a modest effect on shipments, exemptions rising from 21 to 40 per cent between 10 and 200 tonnes while coverage stays above 95 per cent, because the 1-tonne pair sub-cap keeps catching material relationships whatever the importer cap; importer exemptions, however, track the importer cap closely, rising from 43 to 78 per cent. Holding the importer cap at 50 tonnes and raising the pair cap (*Figure 6b*) is the stronger lever for shipments and relationships, exemptions rising from 22 to 74 per cent as the pair cap moves from half a tonne to 50, with coverage easing only from 98.5 to 93.0 per cent, but importer exemptions stay almost flat at around 56 per cent across the whole range. This is the clearest illustration in the analysis that the two dimensions of relief answer to different controls: whole-importer relief is governed by the importer cap, and value-chain relief by the pair cap, so the combined design can tune each without disturbing the other.

Read together, the sensitivities reinforce the baseline on both counts. The cumulative and relationship-based designs (Scenarios 2, 3 and 6) hold their coverage across wide threshold bands, so they can be tuned for more relief at little environmental cost, while the per-shipment and importer-emissions designs (Scenarios 4 and 5) shed coverage quickly as their thresholds relax and the value design stays coverage-neutral throughout. And the two relief dimensions respond to different levers: importer exemptions move with the importer-level thresholds and

[11] Because Scenario 6 combines two thresholds, setting one to zero leaves the other in force: at a zero importer cap the rule reduces to the pair test alone, and at a zero pair cap to the importer test alone. The zero point therefore does not represent full coverage, unlike in the single-threshold scenarios.

barely with the pair cap, which is why the combined test can raise value-chain relief without giving up the importer relief the current rule already delivers.

4.3 The concentration of emissions

One feature of the data underlies the results in this chapter: embedded emissions are highly concentrated. The largest importers account for a considerable amount of all embedded emissions, and the same pattern holds among trading relationships, where a small number of importer-supplier pairs carry most of the emissions.

This is what gives the threshold their shape. The emissions sit in a few large flows that no de minimis threshold would exempt, so any rule that keeps large importers and large relationships in scope retains almost all of them; this is why coverage stays high across the cumulative and pair-based designs, and why it moves so little as their thresholds vary. The relationship-based designs draw their efficiency from the other side of the same distribution: the many small relationships they exempt hold, together, very little embedded carbon, so exempting them lifts a large share of the administrative load at a modest cost to coverage.

This concentration is characteristic of the downstream manufacturing sectors the dataset represents, where a few large importers account for most of both the volume and the emissions.

5. Qualitative assessments

5.1 Circumvention risk

Section 2.3 noted that any threshold applied shipment by shipment invites gaming at the margin: an importer can split a large shipment into smaller ones, each below the line, importing the same goods while escaping the obligation. The question here is not whether that is possible but how much of the emissions base it puts at risk under each design, and on that the scenarios differ sharply.

The exposure is largest by far for the consignment threshold. Under Scenario 5 a shipment is judged on its own weight against the 3-tonne limit, so a liable shipment can be brought below the line simply by dividing it. Of the roughly 5,400 shipments that remain liable, about 1,900, a third of them, sit in the 3-to-6-tonne band just above the threshold, where a single split would exempt them; between them they carry close to 9 per cent of total embedded emissions. A liable population that easily reduced offers weak assurance that the design's coverage would survive importers reorganizing their shipping to fit it.

The cumulative and relationship-based designs are far more resistant, because aggregating an importer's activity over the year removes any gain from dividing individual shipments. The one residual route is that an importer could spread a single supplier relationship across several supplier identities to keep each pair below the 1-tonne threshold under Scenarios 3 and 6, but the emissions within reach of that maneuver are trivial: the liable pairs sitting just above the threshold, in the 1-to-2-tonne band, carry about 0.2 per cent of total emissions. Even if every

one were split, coverage would move by a fraction of a percentage point. The value threshold (Scenario 1) is splittable in the same per-shipment way as the consignment design, but its marginal emissions are just as small, around 0.25 per cent, since value bears little relation to embedded carbon in the first place.

Circumvention therefore points the same way as coverage and sensitivity: the per-shipment designs place a materially larger share of emissions within reach of simple splitting than the cumulative and relationship-based designs, whose annual aggregation leaves little to be gained from it.

5.2 Sectoral scope and the generalizability of the findings

The dataset represents downstream manufacturing, principally automotive and machinery and equipment manufacturing, not bulk-commodity sectors such as cement or fertilizers. The exact figures are therefore specific to the sectors studied and should not be read across to sectors with a different profile.

The ranking of the designs, however, travels further. As Section 4.3 showed, the results turn on the shape of the import distribution, a small number of large flows alongside a long tail of small ones, rather than on anything particular to automotive or machinery supply chains. Wherever that shape recurs, the same ordering of designs should follow.

But sectors differ, and two cases at the edges of that shape show why no single threshold can be expected to fit every sector equally well. Bulk-commodity sectors move goods in large per-consignment loads, with few small supplier relationships; there the pattern is if anything sharper, and only the consignment threshold would behave differently, exempting little where shipments are uniformly large. A fragmented sector is the opposite case: the same volume is spread across many small importers, most of them already below the 50-tonne rule (aluminium is the sector most often mentioned). In such a case, the importer-level rules may already exempt most of the chain, so the combined design's extra advantage, its whole-importer relief, largely disappears. What still adds value in a fragmented sector is the relationship dimension, which continues to relieve the value chain wherever individual relationships are small, so the pair-based design applied on its own would be the more relevant instrument.

The broader point is that different sectors trade in different materials, volumes and structures, and a single de minimis threshold cannot be perfectly calibrated for all of them at once. The evidence here points to the relationship level as the dimension where relief is most needed across sectors; how it is best combined with the importer rule, uniformly or with some sectoral differentiation, is a question the accompanying Policy Proposal takes up. Confirming these sectoral patterns would require data that those sectors have not yet contributed.

5.3 What the administrative burden consists of

The relief metrics used in this study count importers and supplier relationships taken out of scope, but the burden they stand for is not uniform, and two features of it bear on how the results should be weighed.

The first is that the importer-level and relationship-level burdens are different in kind. An importer that remains in scope faces a fixed set of obligations that arise once a year: it must register as an authorized CBAM declarant, submit a single annual CBAM declaration, and surrender certificates. Relieving that importer of one shipment, or one supplier relationship, does not lift these obligations, which is why whole-importer exemption is the relevant measure of relief at the level of the obligated entity. The relationship-level burden is of a different nature: for every supplier relationship that remains in scope, the relevant third-country installation must determine, monitor and communicate the embedded emissions of the goods it supplies, and the importer must obtain and handle that data. This is a recurring, per-relationship cost that falls across the value chain rather than on the importer alone, and it is the burden the relationship-based designs can relieve.

The second is that this relationship-level cost depends on whether embedded emissions are reported using default or actual values, and the two impose very different administrative burdens. Default values are administratively light: the figures are set by the Commission and require no monitoring or verification by the supplier. Actual values are considerably more demanding, requiring the supplying installation to monitor its emissions and the importer to collect, check and document verified data; the Commission's own impact assessment estimates the administrative cost of compliance using actual values at several times that of default values[12]. Default values are, however, set conservatively, so they typically yield a higher embedded-emissions figure and thus a higher CBAM bill. Importers therefore face a trade-off, and to the extent importers move towards actual values precisely to reduce their certificate cost, they will be accepting the greater administrative effort in exchange. As the use of actual values spreads, the administrative burden attached to each supplier relationship in scope will rise accordingly. The value-chain relief that the relationship-based designs deliver, modest where default values dominate, therefore becomes materially more significant over time. This is the burden a purely importer-level metric does not capture.

5.4 Relevance of the study results as CBAM coverage extends

There is a further property worth weighing alongside relief and coverage: how well a design holds its balance as the importer population changes. A threshold that must be recalibrated each time the population shifts carries a recurring cost, in administrative effort and in uncertainty for importers.

The sensitivity analysis in Chapter 4 speaks to this directly. A design whose coverage is flat across a wide band of thresholds is, for the same reason, insensitive to changes in the underlying mix of importers. The cumulative and relationship-based designs sit on such a plateau; the per-consignment and emissions-based designs sit on a slope, where coverage responds sharply to the threshold and would need closer and more frequent adjustment as the population moves around it. As CBAM's scope widens and its importer base grows and becomes more varied,

[12] European Commission, SWD(2025) 58, 26 February 2025, op. cit.

that robustness becomes a practical advantage, one that will make a difference to how smoothly the mechanism operates.

6. Conclusions

6.1 What the data shows

The study set out to test whether the current de minimis threshold strikes the best available balance between administrative relief and emissions coverage, and how alternative designs compare. Measured against a dataset of 63,405 downstream import shipments, the findings are consistent across the baseline, the sensitivity analysis and the circumvention assessment.

The central finding is that administrative relief is multi-dimensional: a threshold can relieve importers or the value chain, and these are not the same. On this evidence the current 50-tonne rule relieves importers well, taking a majority (54 per cent) out of scope while retaining 99.5 per cent of emissions, which is why it is well calibrated on the Commission's own metric; but it does little for the value chain. The pair-based design does the reverse, and only the combined test relieves both, exempting 56 per cent of importers and 74 per cent of relationships at 98.5 per cent coverage. The shipment-based designs, by contrast, exempt more but shed coverage, and are the most exposed to shipment splitting.

6.2 Implications for the threshold

The evidence points in a clear direction. The current rule relieves importers effectively but does little for the value chain, and it is the value-chain burden, the obligation attached to each supplier relationship that remains in scope, that the current rule leaves unaddressed. The most efficient way to relieve that burden without materially reducing coverage is to assess imports at the level of the individual trading relationship: a relationship threshold exempts the many small supplier links that carry negligible emissions, while leaving the large relationships that hold most of the emissions in scope.

This addresses the natural objection that value-chain relief is not worth pursuing, on the grounds that an importer already in scope bears its main compliance costs regardless of how many of its relationships are exempted. That is true of the fixed, importer-level obligations, but not of the relationship-level burden, which is separate and recurring: for every relationship in scope, the supplying installation must determine and communicate verified emissions, and, as Section 5.3 set out, that cost rises several-fold as CBAM moves from default to actual values. Relationship relief is therefore modest today but materially more significant as actual values become the norm, which is precisely the direction of travel.

On the question the current rule raises, whether to replace or complement it, the evidence favors complementing it. The 50-tonne test already performs its coverage and importer-relief functions well and should be kept. The combined importer-and-pair test delivers the largest overall gain in relief by adding a relationship-level exemption on top of that test rather than

discarding it: it keeps everything the 50-tonne rule exempts and additionally exempts the small relationships of larger importers, raising the shipment-exemption rate from around 8 to around 26 per cent, exempting 56 per cent of importers and 74 per cent of relationships, while retaining close to 98.5 per cent of emissions. The recommendation is therefore to complement the current rule with a relationship-level threshold, not to replace it.

One qualification follows from the sectoral analysis. The advantage of the combined design over the current rule lies in its additional whole-importer relief, and that advantage depends on the sector being concentrated, as the downstream sectors studied here are. In a fragmented sector, where the same volume is spread across many small importers, the importer gate already exempts most of the chain, and the relationship dimension carries the value; there, the pair-based threshold applied on its own would be the more relevant instrument. The precise calibration of either, and the choice between them across sectors, is a matter of policy design that the accompanying Policy Proposal takes up; the contribution of this report is to establish, on the evidence, that the relationship level is where the unaddressed relief lies.

6.3 Outlook

The case for acting on this evidence strengthens as CBAM develops. As its scope widens and its importer base grows more varied, a threshold that holds its balance across a wide range of importer profiles, as the relationship-based designs do (Section 5.4), is better suited to that trajectory than one that must be recalibrated. Beyond the mechanics of the threshold, there is a further consideration. The economic incidence of CBAM, on the prices of covered goods and on the competitiveness of the downstream firms that import them, has not yet been widely felt in the EU, but it is likely to become more visible as the definitive regime takes hold and its scope widens. At that point, administrative burden that is not justified by environmental benefit becomes a political liability, not only for CBAM but for the broader carbon-pricing framework it belongs to. Removing avoidable burden while the stakes are still low is therefore prudent as well as efficient. Designing the rule well is not only a matter of improving the present balance, but of setting a threshold that stays sound, and defensible, as CBAM grows around it.

Annex A. Sensitivity tables

Each table reports, for the scenario indicated, how the four measured quantities respond as the threshold is varied across the range tested. The central (baseline) value is shown in bold. Figures are drawn from the study model; percentages are taken over each scenario's assessed shipments.

Table A1 — Scenario 1: Value per consignment

S1: Shipment Value	% Shipments Exempt	% CO2 Covered	% Weight Covered	% Suppliers Exempt	% Importers Exempt
0	0.00%	100.00%	100.00%	0.00%	0.00%
50	29.85%	94.05%	98.45%	18.23%	9.47%
100	36.13%	93.94%	98.41%	24.35%	9.47%
150	39.82%	93.86%	98.38%	27.48%	9.47%
200	43.35%	93.76%	98.34%	30.52%	10.06%
300	47.94%	93.60%	98.27%	35.36%	10.65%
500	54.00%	93.36%	98.10%	41.44%	11.83%
1000	61.85%	92.70%	97.76%	49.63%	14.79%

Table A2 — Scenario 2: Cumulative weight per importer

S2: Cumulative weight per importer	% Shipments Exempt	% CO2 Covered	% Weight Covered	% Suppliers Exempt	% Importers Exempt
0	0.00%	100.00%	100.00%	0.00%	0.00%
10	2.69%	99.92%	99.92%	5.28%	40.83%
25	7.07%	99.76%	99.80%	7.18%	48.52%
50	8.41%	99.47%	99.59%	9.47%	53.85%
75	17.57%	98.92%	99.19%	20.08%	60.36%
100	18.80%	98.54%	98.78%	21.36%	65.09%
150	22.10%	97.95%	98.01%	27.52%	71.60%
200	26.97%	96.49%	96.97%	33.99%	77.51%

Table A3 — Scenario 3: Weight per importer-supplier pair

S3: Weight per importer-supplier pair	% Shipments Exempt	% CO2 Covered	% Weight Covered	% Suppliers Exempt	% Importers Exempt
0	0.00%	100.00%	100.00%	0.00%	0.00%
0.5	15.88%	99.29%	99.93%	64.79%	21.89%
1	19.94%	99.03%	99.86%	70.51%	28.40%
2	25.26%	98.79%	99.73%	75.63%	32.54%
5	33.34%	98.27%	99.39%	81.69%	40.24%
10	46.26%	97.32%	98.89%	85.65%	46.15%
20	53.55%	95.84%	97.88%	89.78%	52.66%
50	74.41%	93.04%	95.55%	94.04%	66.86%

Table A4 — Scenario 4: Cumulative emissions per importer

S4: Embedded emissions	% Shipments Exempt	% CO2 Covered	% Weight Covered	% Suppliers Exempt	% Importers Exempt
0	0.00%	100.00%	100.00%	0.00%	0.00%
1000	33.91%	96.28%	90.31%	41.26%	83.43%
2000	40.35%	94.12%	88.43%	50.73%	87.57%
4000	50.98%	89.46%	82.68%	56.54%	91.72%
6000	57.95%	84.93%	79.12%	61.60%	94.08%
8000	57.95%	84.93%	79.12%	61.60%	94.08%
10000	63.63%	78.44%	72.09%	65.35%	95.86%
20000	91.66%	68.67%	18.55%	93.92%	97.63%

Table A5 — Scenario 5: Consignment weight

S5: Consignment Weight	% Shipments Exempt	% CO2 Covered	% Weight Covered	% Suppliers Exempt	% Importers Exempt
0	0.00%	100.00%	100.00%	0.00%	0.00%
1	84.60%	94.32%	96.93%	80.27%	37.28%
2	89.44%	91.36%	94.27%	83.93%	41.42%
3	91.52%	88.89%	92.34%	86.22%	45.56%
5	93.67%	83.80%	89.19%	89.21%	53.25%
10	96.03%	73.37%	83.14%	92.69%	60.95%
20	97.99%	63.94%	72.87%	95.99%	71.01%
50	98.75%	58.99%	65.38%	97.75%	84.62%

Table A6a — Scenario 6a: combined test, varying importer cap (pair cap held at 1 t)

S6a: Vary Importer Cap (Pair Held at 1t)	% Shipments Exempt	% CO2 Covered	% Weight Covered	% Suppliers Exempt	% Importers Exempt
0	19.94%	99.03%	99.86%	70.51%	28.40%
10	20.61%	98.98%	99.80%	71.50%	42.60%
25	24.68%	98.82%	99.68%	72.58%	50.30%
50	25.77%	98.54%	99.48%	73.97%	55.62%
75	33.48%	98.01%	99.09%	75.96%	62.13%
100	34.39%	97.63%	98.68%	77.22%	66.86%
150	36.50%	97.21%	98.06%	78.94%	72.19%
200	40.40%	95.98%	97.16%	81.08%	77.51%

Table A6b — Scenario 6b: combined test, varying pair cap (importer cap held at 50 t)

S6b: Vary Pair Cap (Importer Cap held at 50t)	% Shipments Exempt	% CO2 Covered	% Weight Covered	% Suppliers Exempt	% Importers Exempt
0	8.41%	99.47%	99.59%	15.03%	55.62%
0.5	22.53%	98.78%	99.53%	69.67%	55.62%
1	25.77%	98.54%	99.48%	73.97%	55.62%
2	30.33%	98.33%	99.37%	78.10%	55.62%
5	37.38%	97.90%	99.11%	82.87%	55.62%
10	49.93%	97.06%	98.68%	86.32%	55.62%
20	56.95%	95.73%	97.76%	90.01%	56.80%
50	74.41%	93.04%	95.55%	94.04%	66.86%

Note on Scenario 6: because the combined test applies two thresholds at once, setting one to zero leaves the other in force. At a zero importer cap the rule reduces to the pair test alone; at a zero pair cap, to the importer test alone. The zero point therefore does not represent full coverage, unlike in the single-threshold scenarios.