ZEW policy brief

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What Should Free Allocation Buy? Leakage Protection and Investment Support in the EU ETS

The EU Emissions Trading System (EU ETS) puts a price on CO_2 emissions while granting eligible firms some allowances free of charge. As the Carbon Border Adjustment Mechanism (CBAM) is phased in, the rationale that free allocation protects against carbon leakage weakens in covered EU markets. Under current reform proposals, free allocation would be given a stronger role in supporting investment in cleaner production. The stakes remain substantial: Free allowances were worth about EUR 36 billion in 2025; their annual value could more than double with higher carbon prices. Free allocation has also helped secure political support for carbon pricing. Compensation, leakage protection and investment support require different economic justifications and assessment criteria. The value of an allowance measures neither the leakage risk nor the support required for an investment. Reforms should therefore take a targeted approach: leakage protection and investment support should be assessed separately, even when delivered together. Continued free allocation should leave room for reviewing who receives support, how much and in what form, while accounting for the political bargain sustaining the ETS.

KEY MESSAGES

- **Free allocation transfers public value.** Governments forgo auction revenue. If companies are to be compensated, it depends on the losses they incur as a result of CO_2 pricing. Their expenditures on allowances only provide a partial picture: a portion of the costs can be passed on to consumers through higher prices.
- **The political bargain can enable and constrain reform.** Repeated extensions of free allocation can make future reductions harder to negotiate as firms expect continued protection. Investment requirements can reduce firms' benefits and their willingness to support reform.
- **Leakage exposure is not a measure of investment needs.** A firm may need leakage protection but lack a suitable clean project; another may face little relocation risk yet have a clean project that would only be profitable with support. Investment support therefore needs its own eligibility criteria.
- **Investment requirements need their own economic justification.** Investment support may include projects that firms would undertake anyway. Investment requirements should be assessed against the investment problems they address, the decisions they change, and the costs of dedicated alternatives.

INTRODUCTION

Free allocation combines leakage protection with political compensation

The EU Emissions Trading System (EU ETS) puts a price on CO_2 emissions while granting eligible firms some allowances free of charge. Two rationales have shaped free allocation. First, it is intended to limit carbon leakage, i.e. the risk that carbon pricing shifts production and emissions abroad to regions with less stringent climate policy. Second, free allocation has underpinned the ETS scheme in the political-economy discussion since the ETS was established, by distributing valuable allowances to help secure support for carbon pricing.

Investment requirements would change the bargain

Current reform proposals provide for a more explicit role of free allocation in supporting investment in cleaner industrial production. The Commission's July 2026 proposal would link continued free allocation from 2031 to investment in decarbonisation in the EU. Although fewer allowances are distributed for free, their economic and political importance remains substantial. Tighter climate targets, the prospect of higher carbon prices and concerns about industrial competitiveness in Europe sharpen the debate over the future of allowances.

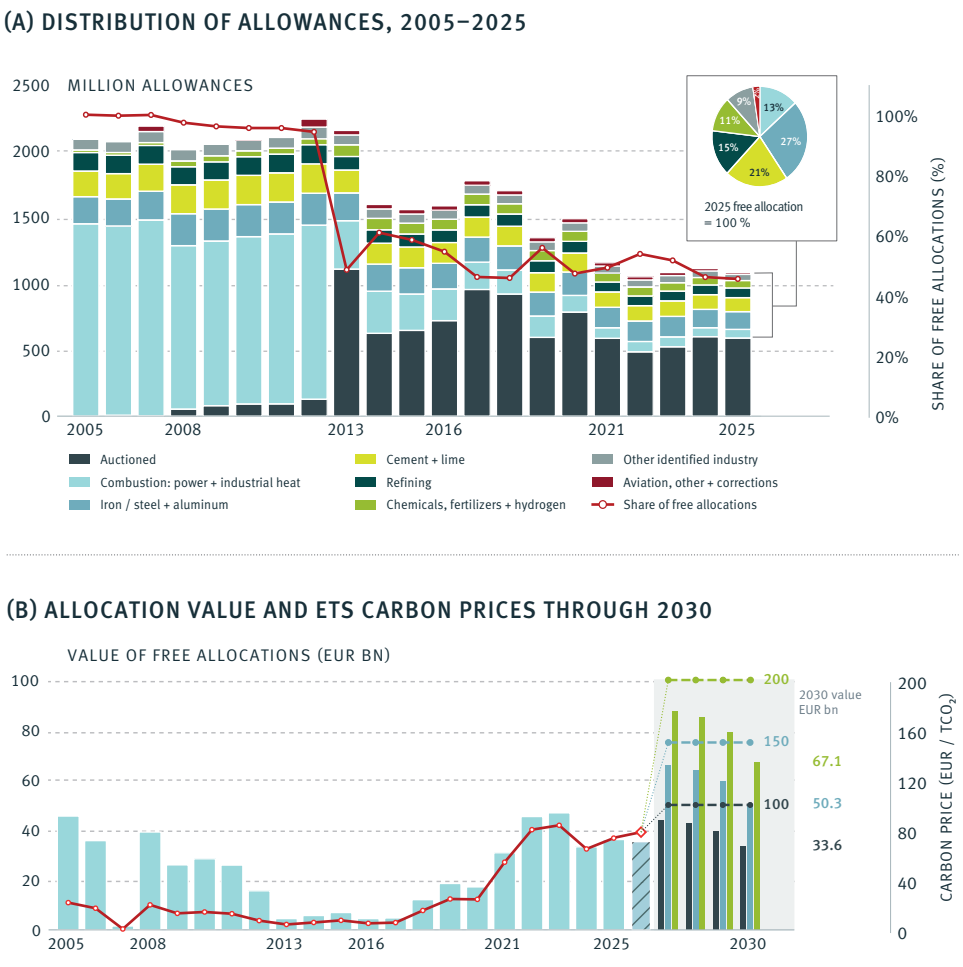
What should free allocation buy? What are the needs that justify its continuation, and how should investment support be organised and financed alongside it? The answers must account for leakage risks, the political bargains sustaining the EU ETS and the practical limits of public intervention. This policy brief (1) quantifies the volume and future stakes of free allocation; (2) describes the changing political bargain behind free allocation and the current reform debate; (3) examines the economic rationales for free allocation and (4) assesses reform options for free allocation and complementary investment support.

THE VOLUME AND FUTURE STAKES OF FREE ALLOCATION

EUR 36 billion in 2025

Under the free allocation, allowances worth tens of billions of euros are transferred each year (Figure 1). Free allowances distributed over 2005–2025 had a cumulative nominal value of about EUR 485 billion (valued at each year's average carbon price). In 2025 alone, their value was about EUR 36 billion. Almost all allowances were distributed for free when the ETS began; by 2025, this share had fallen to 45.5%. Auctioning expanded sharply in 2013, while free allocation to the power and heat sector declined and the remaining allocation became more concentrated in industries exposed to international competition. In 2025, iron, steel and aluminium, cement and lime, and chemicals together received about 60% of all free allowances.

FIGURE 1: FREE ALLOCATIONS IN THE PAST AND FUTURE: DISTRIBUTION AND VALUE



Notes: Own calculations based on EEA Union Registry data from September 2026 (European Environment Agency, 2026), EEA prices for 2005–2020 (European Environment Agency, 2021), EEX auction results for 2021–2026 (European Energy Exchange, 2026) and the European Commission's 2025 auction-calendar update (European Commission, 2025). (a) Bars show auctioned and free allowances; the line shows free allowances as a share of all distributed allowances. The pie chart shows (rounded) sectors' shares of 2025 free allocation. (b) Bars show free allowances multiplied by the carbon prices on the right axis (nominal EUR). Prices are annual means through to 2025 (red line); for 2026, we use the mean EEX auction price through to 14 October. For 2027–2030 (grey), dashed lines show assumed carbon prices of 100, 150 or 200 EUR/tCO_2. Quantities for 2026–2030 follow recorded allocation schedules and are identical across price cases, without further adjustments for production, benchmarks or CBAM-related reductions. Historical coverage follows ETS participation; from 2026, it covers EU 27 industry and eligible heat, excluding aviation and non-EU ETS countries.

Higher prices can sustain value as quantities fall

Scheduled free allocation to industry and eligible heat in the EU 27 declines by about 25% between 2026 and 2030. Higher carbon prices could nevertheless sustain or increase its annual value. At an assumed carbon price of EUR 150 per metric ton, the 2030 allocation would be worth EUR 50.3 billion. Prices of EUR 100 and EUR 200 would imply values of EUR 33.6 billion and EUR 67.1 billion, respectively. Who receives these allowances, and under what conditions, therefore remains consequential for both industrial support and public budgets.

THE CHANGING POLITICAL BARGAIN AND THE CURRENT REFORM DEBATE

EU-wide rules reshaped industrial protection

Free allocation has helped to make a binding carbon constraint politically acceptable by cushioning its distributional consequences. At the ETS's outset, allocating allowances largely on the basis of past emissions softened opposition from existing producers, while national allocation plans preserved member states' discretion. This initial bargain also gave recipients a valuable entitlement to defend in later reforms. The terms changed as the costs of that bargain became visible. Power producers could pass carbon costs through to electricity prices while obtaining allowances for free, which generated windfall profits and weakened the case for continued compensation. From 2013, auctioning became the default for electricity generation, while EU-wide benchmarks and a more explicit carbon-leakage rationale reshaped industrial allocation. Common EU rules reduced national governments' scope to favour domestic producers. Industry lobbying shifted towards sector eligibility and product benchmarks, which shaped how much protection different sectors would receive.[1]

Longer protection in return for investment commitments

The current debate adds clean investment to this bargain. The Commission's July 2026 proposal would give free allocation a more explicit role in financing industrial decarbonisation in Europe. From 2031, recipients would generally need an approved plan for clean investment in the EU, with eligible expenditure at least matching the value of their free allowances over five years. Most allowances (80%) would be released following plan approval, with a smaller share (20%) conditional on verified implementation and emissions reductions. Although there are exemptions to these requirements, the central idea is clear: continued access to valuable allowances would carry an obligation to invest in cleaner European production. These obligations are accompanied by an extension of protection. For goods covered by the Carbon Border Adjustment Mechanism (CBAM), the Commission proposes shifting the complete free allocation phase-out from 2034 to 2038. CBAM is intended to replace free allocation as protection against leakage in EU markets. The proposal slows this transition, citing remaining leakage risks. CBAM does not address EU exporters' exposure in foreign markets.

Concessions can secure support and entrench expectations

The proposed reform can be understood as a renegotiation of the political bargain sustaining the ETS. Alongside compensation for carbon costs and protection against leakage, free allocation would acquire a more explicit industrial-policy purpose: securing commitments to decarbonise production within Europe. The proposed compromise combines longer protection with stronger decarbonisation commitments. Historical evidence does not establish how much additional climate ambition a given transfer secures. Such bargains may help secure support for tighter emissions limits and their continued enforcement. However, repeated concessions may also reinforce expectations of continued support and increase resistance to later reform. Whether continued allocation secures support for tighter emissions limits is a political economy-related question. A separate question is whether allocation rules improve production and investment incentives. Political acceptance alone is no proof that the existing recipients, amounts or conditions are economically justified.

1 Before 2013, governments proposed national allocation plans, subject to Commission approval. From 2013, common EU rules limited their discretion: Sectors classified as exposed to carbon leakage received a larger share of their benchmark-based entitlement, while product benchmarks set the reference allocation per unit of output. Industry could influence both the eligibility criteria and the technical design of benchmarks, for which regulators relied partly on industry data. Governments could still defend domestic industries in EU negotiations, but comparable producers across countries generally faced the same rules.

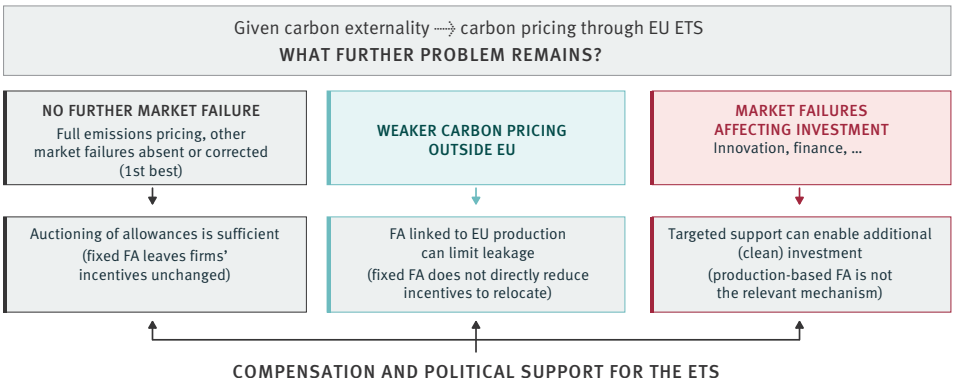
ECONOMIC RATIONALES FOR FREE ALLOCATION

Compensation, leakage protection and clean investment address different problems. A transfer of allowances can compensate firms for losses without changing their behaviour. But if the aim is to prevent leakage or encourage additional clean investment, this requires influencing firms' production and investment decisions. Figure 2 illustrates the implications of three different economic settings for investment support: Auctioning is sufficient when emissions are appropriately priced worldwide and other market failures are absent or corrected; production-linked allocation can limit leakage; and targeted support can address market failures affecting investment. Leakage risks and investment-related market failures can coexist.

Fixed allocations preserve incentives but redistribute value

The idealised economic benchmark. An allowance is a tradable asset: using it to cover emissions means forgoing its sale value. This opportunity cost arises even if the allowance was received for free. Firms therefore still have an incentive to avoid emissions. If firms can freely buy and sell allowances without influencing their price (no market power), and if access to finance does not constrain their choices, a fixed allocation then raises profits without changing the incentives to adjust output or reduce emissions per unit of output. Here, "fixed" means that the future free allocations do not depend on the firms' decisions. They would receive the same allowances even if they were to reduce production, adopt cleaner technology or close a plant. Assuming (unrealistically) that worldwide emissions are comprehensively priced to reflect their climate damage and that other market failures are absent or corrected, the incentives for firms are then efficient (the first-best benchmark). Auctioning is sufficient from an efficiency perspective (Figure 2, left column). Fixed free allocation has an impact on profits and public revenue while preserving these incentives.

FIGURE 2: FREE ALLOCATION: RATIONALES AND LIMITS



Production-linked allocation changes firms' incentives

Production and location incentives. Current EU ETS rules already depart from the fixed-allocation benchmark: Free allowances depend on continued operation and production levels. For production covered by product benchmarks, the basic relationship is

Free allowances ≈ eligible production × product benchmark × allocation factor.

The product benchmark specifies allowances per unit of product. The allocation factor reflects leakage risks, the CBAM-related phase-out for covered products and other adjustments.

Eligible production is updated with a lag and subject to thresholds.[2] The formula uses production and standardised emissions intensities to approximate carbon-cost exposure without reimbursing each plant's actual emissions.

This simplifies administration and preserves incentives to reduce emissions per unit of output, but it does not establish how much support is needed to prevent leakage. Producing more can bring additional allowances; producing less can reduce future allocation, while closing the plant ends future support. These rules therefore subsidise continued production and can influence where firms operate or invest. They weaken the incentive to cut emissions by producing less. Cutting emissions per unit of output still enables firms to avoid paying the full carbon price for each metric ton avoided, provided allocation remains unchanged. This support for production needs economic justification beyond compensation. Preventing carbon leakage provides one: linking allocation to EU production can serve a corrective purpose by countering incentives to shift production and emissions to countries with weaker carbon pricing.

Leakage protection. Where the EU cannot directly correct weaker carbon pricing abroad (a second-best setting), free allocation linked to production or continued operation can help limit leakage (Figure 2, middle column). As CBAM takes over protection against covered imports, the remaining case for free allocation needs to distinguish between export exposure and activities outside CBAM's scope. This includes future investment: A firm may keep its existing EU plant open but build its next plant abroad to avoid carbon costs. These decisions depend on expected carbon costs and protection over the plant's lifetime. Uncertainty about future carbon pricing and allocation rules can delay investment or influence location decisions. Support should therefore reflect how each additional euro affects the likelihood or extent of relocation, and the resulting emissions abroad. Trade exposure and carbon intensity provide only a rough guide to these responses. Protecting production through output-linked allocation involves a trade-off: By keeping carbon-intensive goods cheaper, it can weaken consumers' incentives to reduce their consumption or choose cleaner alternatives. To meet the emissions cap, more reductions through cleaner production or in other ETS sectors are then required. This could result in emission reductions being shifted to more costly measures.

Leakage protection involves a consumption trade-off

Clean investment. Carbon pricing already rewards cleaner production, so additional support needs further economic justification. Such support may be warranted when firms cannot capture the wider benefits of their innovations, or when financing barriers and difficulties in coordinating shared infrastructure prevent socially valuable projects. Cleaner technology can be profitable only if firms expect carbon pricing to remain sufficiently stringent over the technology's life cycle. Support may also be useful when there is uncertainty about whether future policy will safeguard the returns associated with cleaner production. Credible long-term commitments and contracts can reduce this risk. Targeted support can therefore complement carbon pricing (Figure 2, right column). An investment problem does not by itself justify free allocation as the response. Dedicated instruments can support investment directly. Linking investment requirements to continued allocation is another option, but an advantage over supporting investment separately needs to be evident. Activities for which substantial allowances are needed may also offer significant opportunities for emissions savings. However, the return on a particular investment depends on the emissions avoidance achieved and the investment costs, rather than on existing allocation alone. Higher carbon prices already reward those savings; free allocation adds an additional in-

Additional investment support needs economic justification

2 Eligible production: For existing plants, initial allocation uses historical production. Adjustments use average output over the previous two years, with a first adjustment triggered by a change of more than 15% from the historical baseline. Product benchmark: This is a common reference based on the average emissions per unit of output of the most efficient 10% of installations producing the same product. Benchmarks are tightened over time to reflect technological progress. Allocation factor: Sectors classified as exposed to carbon leakage generally qualify for 100% of the benchmark-based amount before further adjustments; less exposed sectors receive a smaller share. Other adjustments include reductions for unmet energy-efficiency or climate-neutrality-plan requirements, where applicable, and any correction needed to keep total allocation within the available budget.

centive to adopt cleaner technology only where choosing cleaner production increases the support received. Investment support should be assessed by whether it enables socially valuable investment that would otherwise not occur.

Carbon bills do not measure compensation needs

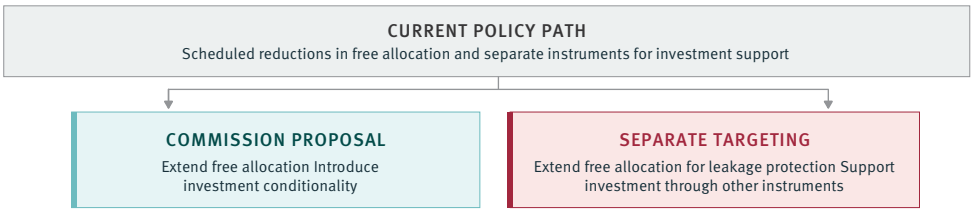
Compensation and distribution. Free allocation can compensate existing producers for losses in asset values or facilitate adjustment to carbon pricing, thus helping to secure political support across the economic settings shown in Figure 2. The decision whether, and to what extent, a loss is to be compensated is a distributional choice: Firms receive a valuable public asset, while governments forgo auction revenue that could finance other priorities. The compensation needed to preserve profits cannot be inferred from a firm's carbon bill. Some costs may be passed on to consumers, while profits also depend on changes in sales and production costs. Compensation should therefore reflect the losses it aims to address; it does not, in itself, justify subsidising each additional unit produced.

Beyond these rationales, the debate over free allocation also reflects concerns about retaining European industrial capabilities, securing supplies against geopolitical disruptions and sustaining employment in regions dependent on particular industries. These objectives are distinct from leakage protection and additional clean investment. Free allocation is a blunt instrument for pursuing them: Production levels and emissions benchmarks do not directly reflect the economic costs of supply disruptions or the adjustment costs faced by particular industries and regions.

FREE ALLOCATION AND INVESTMENT SUPPORT: DESIGN PRINCIPLES AND OPTIONS

If substantial free allocation continues, how should carbon leakage protection and investment support be related? Current rules already influence where firms operate and invest by linking free allocation to production. The Commission's July 2026 proposal would prolong free allocation for CBAM goods and introduce additional investment requirements. Figure 3 contrasts this proposal with an approach that extends free allocation for leakage protection while supporting investment through other instruments. Both reform paths extend free allocation beyond the current schedule but differ in how they link leakage protection and investment support. The case for continuing leakage protection does not in itself justify making that protection conditional on investment.

FIGURE 3: FREE ALLOCATION AND INVESTMENT SUPPORT: ALTERNATIVE DIRECTIONS OF REFORM



Leakage exposure does not establish a need for investment

In the following, we highlight general design principles and discuss their implications for the benefits and limitations of reform options. Match support to its purpose. Leakage protection and investment support need distinct criteria for eligibility and support levels. Leakage support should reflect how it changes production and location decisions and the resulting emissions abroad. This assessment should include export markets, which CBAM does not cover, and activities outside CBAM.

Investment support should address market failures affecting investment, such as knowledge creation and diffusion spillovers, or problems with the credibility of future policy. A plant may need leakage protection yet lack a suitable investment project; another may have a promising project but face little relocation risk. Eligibility for one form of support should therefore not automatically imply eligibility for the other. A firm may still warrant leakage protection even if further investment support is not justified.

Spending commitments do not establish additionality

Assess investment requirements for additionality and economic justification. Where free allocation continues, investment requirements should induce firms to start projects that they would not otherwise undertake.[3] Requiring firms to spend an amount equal to the value of their free allowances does not establish additionality: They may count this towards projects they would undertake anyway. Allowance value also provides little information on the support a project needs since it reflects production, benchmarks and carbon prices. More investment does not necessarily imply a better use of public resources. Investment requirements need to address market failures or policy-credibility problems left unresolved by carbon pricing, and the resulting benefits should justify the investment and implementation costs. Their effects on leakage protection also matter.

Auctions can fund targeted investment support

Choose and fund investment instruments. Where investment support is justified, grants can help cover initial investment costs, while carbon contracts for difference can contribute towards the additional costs of cleaner production and make part of the return on investment less dependent on future allowance prices. Reform could build on the EU Innovation Fund, which uses allowance-auction revenues to support projects through competitive calls and auctions.[4] Competitive selection can help compare requested support and limit overcompensation. These targeted instruments can complement free allocation but, unlike in the Commission proposal, do not use free allocation rules for investment support. Auctions for some allowances that would otherwise be allocated for free could expand dedicated investment support. Whether the proceeds would be sufficient depends on the programme's scale, expected payments and the funding risks over its duration.

Investment requirements can weaken recipients' support

Account for public costs and distributional effects. Within a given cap, additional free allocation leaves fewer allowances for auctioning or for other recipients. If the allowance value is redirected to investment programmes, this shifts support from existing recipients towards firms with eligible projects. The definition of investment requirements also has the effect of reducing the value of free allocation for recipients if the required investments cost more than the private returns they would expect. Even if firms receive free allowances of the same value, these requirements can therefore weaken their support for the reform.

Enforcement can conflict with leakage protection

Design based on information and enforcement limits. Standardised allocation rules reduce the need to assess each firm's support requirements individually. Investment requirements add another task: Authorities must assess firms' investment plans and check whether they are implemented. More detailed reporting can help with these checks but raises costs for firms and authorities. Even when a project is completed, this does not establish whether it would have gone ahead without support. A further difficulty arises from the enforcement of investment requirements linked to free allocation: Withdrawing allowances after a missed commitment may also remove justified leakage protection, creating pressure to waive the penalty. Separate instruments allow investment support to be withheld without automatically withdrawing leakage protection, although they still require project assessment, monitoring and coordination.

3 Recognising past low-carbon investment may serve fairness or policy credibility but cannot be credited with causing it.

4 The Innovation Fund's 2020–2030 funding basis comprises approximately 530 million allowances. For comparison, auctioning an illustrative 10% of scheduled free allocation in 2027–2030 would release about 159 million allowances. The Fund's full envelope is not its remaining uncommitted budget.

CONCLUSION AND OUTLOOK

Assess leakage protection and investment support separately

Free allocation remains economically substantial and politically consequential even as the number of allowances distributed for free declines. It can help to limit leakage and sustain support for the ETS, but the introduction of clean-investment obligations requires its own economic justification. Leakage protection and investment support should therefore be assessed separately, even when delivered together. If access to allowances is conditional on investment in technology, this can influence technology choices. However, the conclusion should not be that the investment is additional or addresses a problem left unresolved by carbon pricing. Standardised allocation rules simplify administration, yet allocations awarded do not establish how much support is needed to prevent leakage or make a particular clean investment viable.

Design must reflect what authorities can assess and enforce

The next stage of reform should translate this distinction into an assessment of remaining leakage risks and the market or policy problems affecting investment. For leakage, this includes exposure in export markets and activities outside CBAM. For investment, it means examining whether conditions attached to free allocation or dedicated instruments can address the identified problems at acceptable cost. These assessments will remain imperfect, making reporting requirements, enforcement and administrative capacity part of the instrument choice. Continued free allocation should leave room to reconsider who receives support, how much they receive and through which instrument, while recognising the political consequences of changing the existing bargain.

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