Price Production and Consumption Separately

A two-track architecture for carbon pricing in open economies

One carbon price does two jobs, and in an open economy the second undermines the first. Price production with a revenue-neutral feebate and consumption at the destination: the full carbon price signal, without leakage and at no cost to the treasury.

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Carbon prices are too low and too narrow to meet the Paris goals

28%

of global emissions covered by an explicit carbon price (2025)

~$19

per tonne of CO_2: the average price where a carbon price applies (about $5 averaged over all emissions)

$50–100

per tonne by 2030, at least: the range judged consistent with the Paris goals

The usual explanation is political will. Part of the gap is built into the instrument.

Source: World Bank, State and Trends of Carbon Pricing 2025; High-Level Commission on Carbon Prices (2017).

In an open economy, one price does two jobs and the second undermines the first

Job 1: cut emissions per tonne of output. A carbon tax on producers does this well.

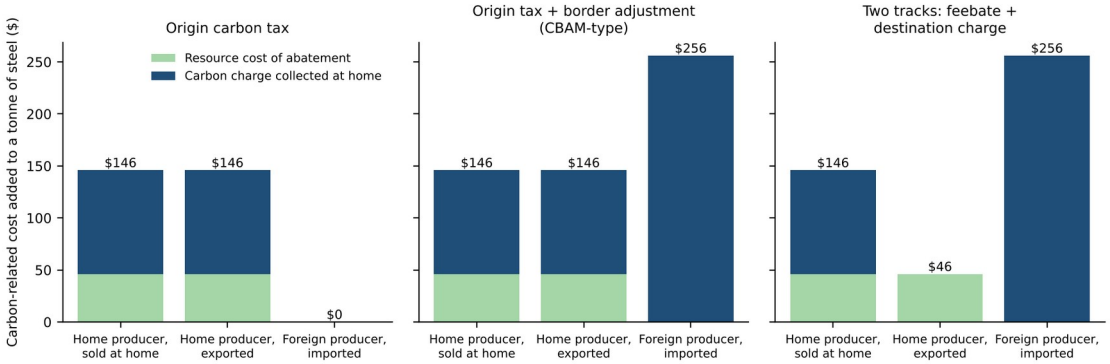
Job 2: make buyers pay for carbon. The tax raises the price of everything the country makes, so buyers use less.

Exports pay, imports do not. Part of the fall in home output is replaced by foreign supply: leakage, 5–25% of the emission cut in model studies, concentrated in steel, cement and other trade-exposed industries.

So governments exempt industry or keep the rate low. A border charge on imports (the EU's CBAM) protects the home market but leaves exports carrying the bill.

Source: Branger and Quirion (2014); Keen, Parry and Roaf (2022).

Two tracks: price production by intensity, consumption at the destination



Carbon-related cost per tonne of steel at $80/tCO$_2$ (stylized: home mill at Türkiye's default intensity, foreign at China's).

Production track: a feebate. Pay on emissions per tonne above the sector average, rebate below. Payments cancel; the full marginal incentive stays.

Consumption track: a carbon component of VAT, imports charged, exports exempt; plus a forward obligation on fuel suppliers.

Exports carry only the cost of the abatement itself.

Source: Author's calculation; working paper 1.1, Figure 1.

A feebate raises exporters' costs about a third as much as a tax at the same rate

Hot-rolled steel exporter (default tCO_2/t)	Carbon tax at $80	Feebate at $80
Japan (2.1)	+21%	+7%
Türkiye (2.4)	+25%	+8%
China (3.2)	+32%	+10%
India (4.3)	+43%	+14%

A tax charges for every tonne still emitted; a feebate only for the cost of cutting. The most carbon-intensive exporters gain most from choosing a feebate.

Source: EU default values (Implementing Regulation (EU) 2025/2621); base price $600/t and abatement costs stylized. Working paper 1.1, Table 1.

The feebate gives no reason to consume less; the consumption track supplies it, without leakage

The saving has a price. Alone, a feebate needs a higher rate than a tax to cut the same tonnes, because it barely raises the average price.

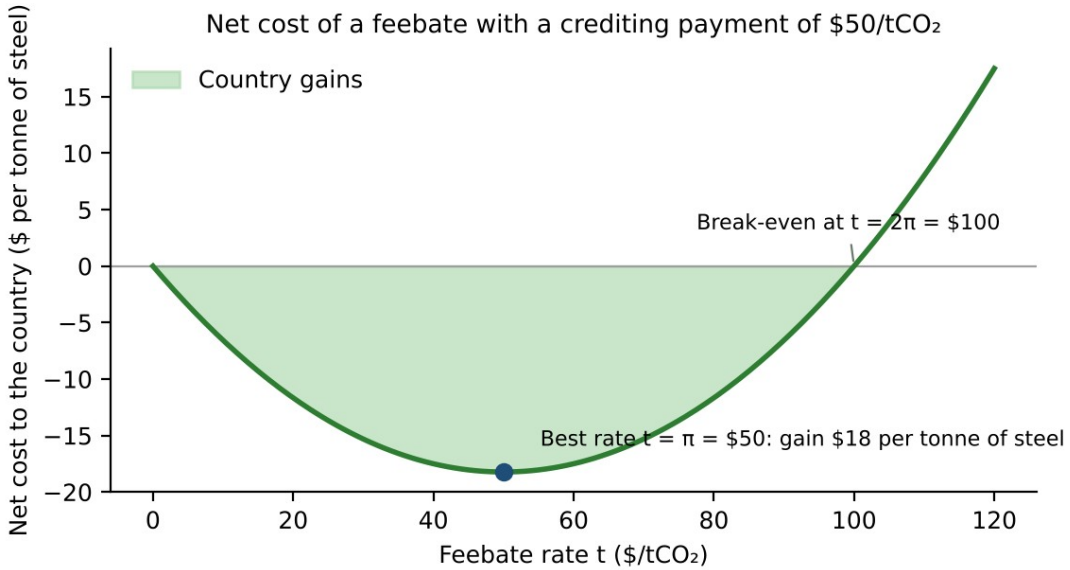
A carbon component of VAT charges home-made and imported goods alike, so buying abroad gains nothing. The value part of VAT can fall as the carbon part rises.

Fuel for homes and vehicles is covered by a legal obligation on the few large suppliers, announced years ahead so investors know the price.

The two rates can differ. The production rate can be high because it barely raises costs; the consumption rate is set by what households accept.

Source: Working paper 1.1, Sections 4–5; Brief 1.3.

Climate finance above half the feebate rate makes adoption a gain for the country



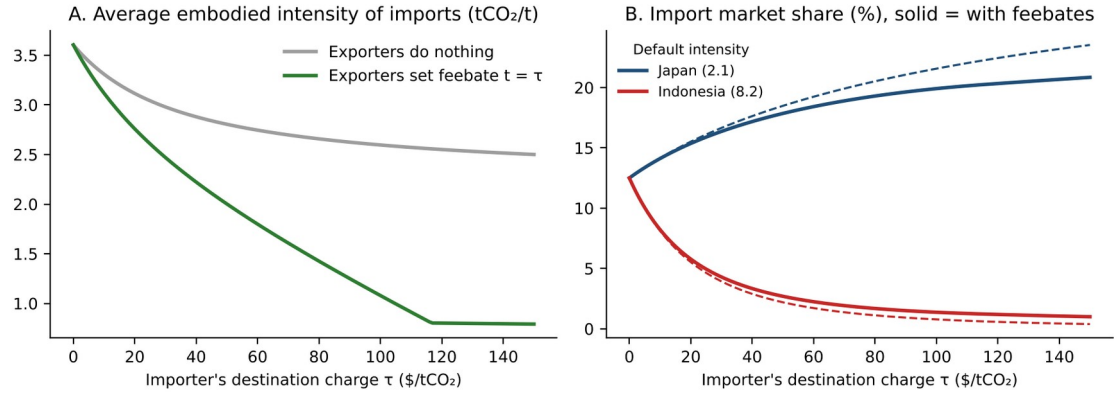
Average cost is half the marginal cost: the cheapest cuts come first.

So a payment above half the rate pays, and the country's best feebate rate equals the payment.

Pay for policies, not projects: a whole sector's measured intensity, not contested single installations. Under an Article 6 transfer the threshold rises to about 1.5 times the rate.

Source: Author's calculation, steel at Türkiye's default intensity, payment $50/tCO₂; Strand (2020).

Border charges set by country and sector turn leakage into a race to the top



Simulated steel import market, eight exporters at EU default intensities (prices and costs stylized).

No mill can move its country's charge; a national feebate can. The best feebate rate equals the charge.

At a $100 charge, import carbon falls 28% through supplier mix alone, 70% when exporters respond.

Today's CBAM credits only a price paid, so a feebate earns nothing. Credit carbon-price equivalents.

Source: Author's calculation; working paper 1.1, Figure 3.

The design rides on systems that already exist

Data: the feebate needs sector output, plant emissions and a benchmark rule. The CBAM already defines plant measurement in six sectors.

VAT: the consumption charge needs a working VAT. Countries without one can run the feebate first, where most of their emissions are.

Trade rules: a charge levied alike on imports and home goods, exports exempt, follows border adjustment of internal taxes; the feebate's rebate leg needs careful drafting.

Households: measure the net effect of the VAT shift on poorer households before setting the rate.

Source: Working paper 1.1, Sections 8–9; Mehling et al. (2019).

What to do

What the analysis shows

Equivalence: at one rate, the two tracks give the Pigouvian outcome for home consumption, with no leakage through goods.

Cost: a feebate costs exporters about a third of a tax.

Crediting: payments above half the rate make adoption a gain.

Race to the top: exporters match their markets' charge at home.

Actions

Exporting countries: start with a production feebate in the sectors that already report to the EU.

The EU and other importers: charge by country and sector; credit feebates and non-price policies at their carbon-price equivalent; add a carbon component to VAT.

Development banks: pay for verified cuts in sector intensity, above half the induced feebate rate.