

The Carbon Leakage Conundrum

getting the EU ETS abatement investment signals right

EU industry sectors are concerned that they will lose out to competitors outside the scope of the EU Emissions Trading System as a result of carbon costs not faced elsewhere. This report examines the current and proposed free allocation approach for avoiding displacement of industrial activities.

Key Messages

- The EU ETS market mechanism seeks least cost abatement via a robust carbon price to promote investment in clean, low-carbon technologies. Under a steadily reducing cap all sectors must play their part. Phase 4 reform should not result in increases in free allocation levels to highly emitting sectors.
- Applying a 'downwards only' principle for free allocation to sectors meeting the criteria for carbon leakage protection would provide policy certainty and free up approximately 450 million allowances, allowing room to maintain the auction share of the ETS cap for innovation funding support (or, preferably, to attenuate the overall cap to actual emissions levels).
- Participants should only accumulate significant allowance surpluses (to trade as an asset) if they have successfully reduced their emissions intensities.
- Carbon leakage risk should not be confused with other competition factors.
- Carbon-cost-pass-through-potential should remain an explicit carbon leakage exposure assessment criterion.
- Carbon leakage risk is not the same for all sectors exceeding the 0.2 binary threshold carbon leakage assessment value. We should target future support to sectors most at risk.
- Innovation funding support for low carbon, high value-added industrial products should be enhanced. We need more targeted policy support for deep decarbonisation of industrial sectors critical for a low carbon EU economy.

About Sandbag

Sandbag is a London and Brussels-based not-for-profit think tank conducting research and campaigning for environmentally effective climate policies.

Our research focus includes reforming the EU Emissions Trading System and the Effort Sharing Decision, accelerating the phase-out of old coal, and deep decarbonisation of industry through technologies including Carbon Capture & Storage.

For more information, visit sandbag.org.uk or email us at info@sandbag.org.uk

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1 Introduction

EU industry sectors are concerned that they will lose out to competitors outside the scope of the system as a result of carbon costs not faced elsewhere. Concerns about displacement of industrial activities to regions outside the scope of the EU Emissions Trading System (ETS) are at the heart of the system's reforms (currently at the Trialogue stage). The current approach for avoiding activity displacement is to allocate free allowances to sectors considered to be at risk of such carbon leakage displacement. Carbon leakage concerns, combined with the desire of Member States to keep hold of auction revenue potential, are acting as a brake on attempts to attenuate the overall supply of allowances (the cap) to current and expected on-going demand levels.

Sandbag considers the on-going free allocation approach for avoiding displacement of industrial activities to be flawed (see Section 3). It leaves some highly emitting sectors with little or no carbon price incentive to decarbonise. Indeed, in most Member States the cement sector ends up with a carbon asset even without emissions intensity reductions.

It is difficult to disentangle concerns about carbon leakage from other competitive factors. We strongly advocate that alternative approaches to carbon leakage protection should be introduced without delay.

The reform options currently being discussed at the Trialogue stage all result in a step change upwards in free allocation to the most highly emitting sectors (see Section 2). This is not sending the right abatement investment signals to these sectors. Furthermore, demand for continued high levels of free allocation undermines efforts to establish significant auction revenue funds for supporting EU innovation, modernisation and just transition projects.

Industrial emissions in context

It has been estimated that we have approximately 5 years left at current emissions levels before the global carbon budget to remain below 1.5 degrees of warming has been used up¹. All regions and sectors must play their part in reducing emissions. About 45% the EU's emissions are covered by the ETS². Of this, approximately 40% comes from industry sectors³. So far, while power sector emissions have been falling steadily in the EU, industrial emissions have not⁴.

Decisions and differences

Highly emitting industry in the ETS region is dominated by large multinational companies who base their operating and investment decisions on a broad portfolio of business factors with little room for allegiance to any one country or region. So far, the carbon cost⁵ faced by industry has varied, not only from industry sector to industry sector but also between different Member States for the same industry sectors (see Section 5). When considering reforms for the post-2020 period, it is important to understand these differences. Sandbag's modelling indicates that differences in free allocation 'tightness' are likely to persist in Phase 4.

¹ Analysis by CarbonBrief using Intergovernmental Panel on Climate Change (IPCC) and Global Carbon Project estimates of remaining carbon budgets, available [here](#)

² See EU Commission's ETS webpage [here](#)

³ Data from EUTL, Sandbag calculation based on in-house classification of installations (largely based on NACE code)

⁴ See Sandbag analysis on the Commission's 01 Apr 2017 preliminary verified emissions data release [here](#)

⁵ The balance between the cumulative allowances received since 2008 and cumulative emissions

Carbon cost is just part of the picture when making decisions on where to invest. Industry decisions are strongly influenced by access to growing markets, existing regional capacity levels, labour terms and rates, and by access to resources and technology.

All standing together ...

Under the EU ETS, if industry's application for free allowances exceeds the maximum available for free allocation, the Directive allows for a uniform 'haircut' to keep them under the maximum. This cross-sectoral correction factor (CSCF) is quite severe in Phase 3⁶. However, for Phase 4, instead of agreeing to leave room under the cap for more highly exposed sectors by giving fewer allowances to sectors less exposed to carbon leakage risk, industry bodies stood together to lobby for equal compensation of 100% of benchmarked free allocation⁷ for all sectors remaining on the carbon leakage list. To avoid or at least delay a CSCF in Phase 4, the combined lobbying power of industry again stood together to get an increase in the maximum number of allowances available for free allocation to them.

At the start of the Trialogue stage of ETS Reform, the positions of both the Parliament and the Environment Council allow for reduction of the auction share of the cap⁸. This means taking away allowances from Member States that could otherwise be auctioned to provide state income.

... not quite standing together

Not content with these provisions, and despite the initial united stand to treat all sectors above the binary threshold for carbon leakage risk assessment equally, a few sectors broke away from the rest shortly before the Parliament vote. These sectors lobbied successfully for a Parliament position which exempts them from *any* CSCF⁹. This means that if the free allocations run out, other industries will receive a stronger 'haircut'.

2 Step-change upwards in free allocation to highly emitting sectors

Benchmarked applications for free allocation substantially exceeded the maximum available in Phase 3 which led to a severe CSCF. The applications were based on pre-recession historical activity levels; there were more sectors included on the carbon leakage list; and sectors not on the list were still entitled to high percentages of benchmark for much of the phase¹⁰.

For Phase 4, a CSCF is not likely to be needed until much later in the phase (if at all). The factors listed below combine to reduce the total application for allowances across all sectors whilst at the same time raising the total number of allowances available for free allocation under the cap:

- activity level resets¹¹
- benchmark reductions¹²

⁶ CSCF originally calculated for Phase 3 started at just over 94% for 2013 and reached just over 82% for 2020 (NB: CSCF revised in January 2017 to be even stronger, see [Commission Decision \(EU\) 2017/126](#))

⁷ Since the start of Phase 3, free allocation is benchmarked to the carbon intensity of the best performing 10% of the installations in the sector

⁸ By up to 5 percentage points for Parliament (just over 775 million) and by up to 2 percentage points for Council (just over 310 million)

⁹ Under the Parliament position, if the applications for free allocations exceed the maximum number available then sectors with trade intensity with third countries =>15% and carbon intensity =>7Kg CO₂/Euro GVA will be exempt from the CSCF; Sandbag expects these sectors to include NACERev2 classes 24.10 Iron and steel, 19.20 Refined petroleum, 20.15 Fertilisers and nitrogen compounds, 24.42 Aluminium production, 19.10 Coke oven products

¹⁰ 80% in 2013 decreasing to 30% in 2020

¹¹ Most likely lower for Ph4 (pre-recession activity levels influenced calculations for Ph3)

¹² Minimum and maximum benchmark reduction percentages per sector are still to be negotiated during Trialogue

- carbon leakage assessment changes¹³
- + taking allowances from the auction share¹⁴
- + augmentation of the effective cap with allowances originally destined for the Market Stability Reserve (MSR)¹⁵

Chart 1 below compares 2020 and 2021 free allocations for the top 8 emitting sectors plus the rest for the three positions:

Commission Proposal¹⁶

Parliament following the Plenary vote¹⁷

ENV Council General Approach¹⁸

A fourth comparison, 'Hybrid', is similar to the Parliament position but maintains the auction share at 57% and reduces all benchmarks by the same rate (-1%). This 'Hybrid' still gives more free allocation to the top 8 emitting sectors without triggering a CSCF.

The Parliament position avoids an overall increase in the total free allocation to all sectors because it gives 0% of benchmark to sectors not on the carbon leakage list. District heating is handled as an exception and gets 30% of benchmark. The Parliament position also reduces demand by allowing system opt-out for additional Small to Medium Enterprise (SME) small emitters¹⁹. At the same time, it sets aside some free allocation (one third of 3% of the cap²⁰) to provide for a fund for indirect carbon cost compensation to carbon leakage exposed sectors.

In all three positions under negotiation at Trialogue, the top 8 emitting sectors will receive more free allocation in 2021 than they do in 2020 – even after adjustment of the benchmarks downwards to account for technological advances.

¹³ Fewer sectors expected on carbon leakage list post-2019 (Council position keeps current list for 2020)

¹⁴ Commission position -> no reduction of auction share; Council position allows for up to 2% reduction; Parliament position allows for up to 5% reduction

¹⁵ Differing amounts for Commission, Council and Parliament positions

¹⁶ Binary carbon leakage protection 100%/30%; 57% auction share; all BM reductions -1% except NACE sectors 17.12 & 20.15 at -1.5% & 19.20 & 24.10 at -0.5%; NER from Ph3; 400 for InnovFund from Ph4 free alloc

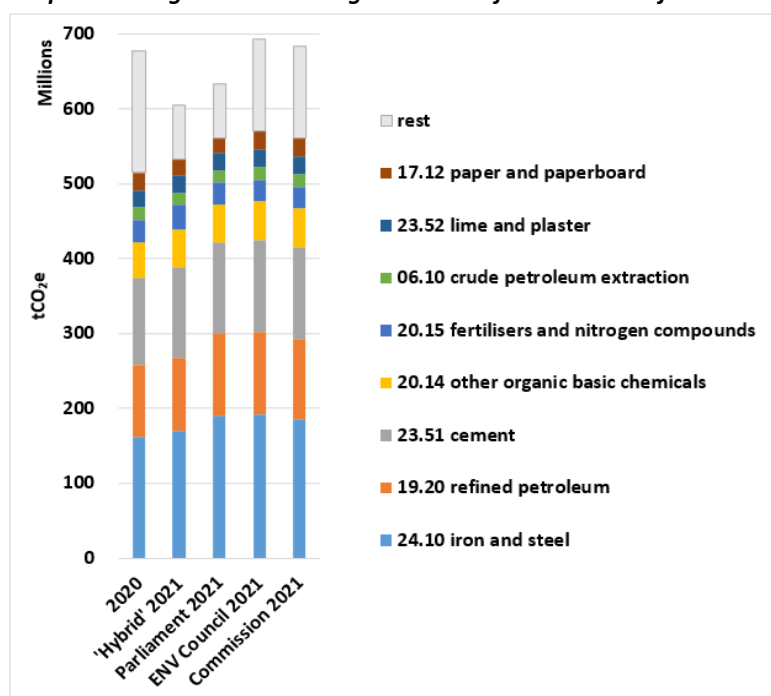
¹⁷ Binary carbon leakage protection 100%/0% but 30% for district heating; 55% auction share; all BM reductions -1% except NACE sectors 17.12 & 20.15 at -1.5% & 19.20 & 24.10 at -0.3%; NER from Ph4; 300 for InnovFund from Ph4 free alloc; 3% cap set aside for indirect cost comp (1/3 from free alloc); SME small emitters excluded

¹⁸ Binary carbon leakage protection 100%/30%; 55% auction share; all BM reductions -1% except NACE sectors 17.12 & 20.15 at -1.5% & 19.20 & 24.10 at -0.3%; NER from Ph3; 400 for InnovFund from Ph4 free alloc; additional Ph3 carry over

¹⁹ Sandbag estimates that, depending on whether sectors not on the carbon leakage list receive 0% of benchmark (Parliament position) or 30% of benchmark (Commission and ENV Council position), approximately 170 to 250 million allowances are likely to be freed up by excluding additional SME small emitters

²⁰ 155 million allowances from the free allocation share, 310 million allowances from the auction share

Chart 1. The top 8 emitting sectors take a great share of the available free allocation in 2021



2020 free allocation data from EUTL; 2021 from Sandbag modelling

Not such a progressive transition to auctioning

Reforms to the method of distributing allowances for Phase 3 introduced a progressive transition to auctioning. The Commission's ETS webpage clearly states²¹:

"Auctioning is the default method of allocating allowances within the EU emissions trading system (EU ETS). This means that businesses have to buy an increasing proportion of allowances through auctions."

"Auctioning is the most transparent allocation method and puts into practice the principle that the polluter should pay."

Increases in free allocation to highly emitting sectors post-2020 are in marked contrast to these principles. Continued free allocation is only justified as a measure to shield internationally competing industry from carbon leakage risk. In this context, the October 2014 EU Council concluded that free allocation should continue post-2020 to prevent the risk of carbon leakage²² but that the share of allowances to be auctioned should not be reduced.

Sandbag has no issue with protecting industry from carbon leakage risk. We do, however, lack confidence that the current approach and extent of carbon leakage protection is appropriate: neither for the current phase nor for the post-2020 period.

²¹ See Commission's webpage on EU ETS Auctioning [here](#)

²² See [EUCO 169/14](#) p.2 & p.3

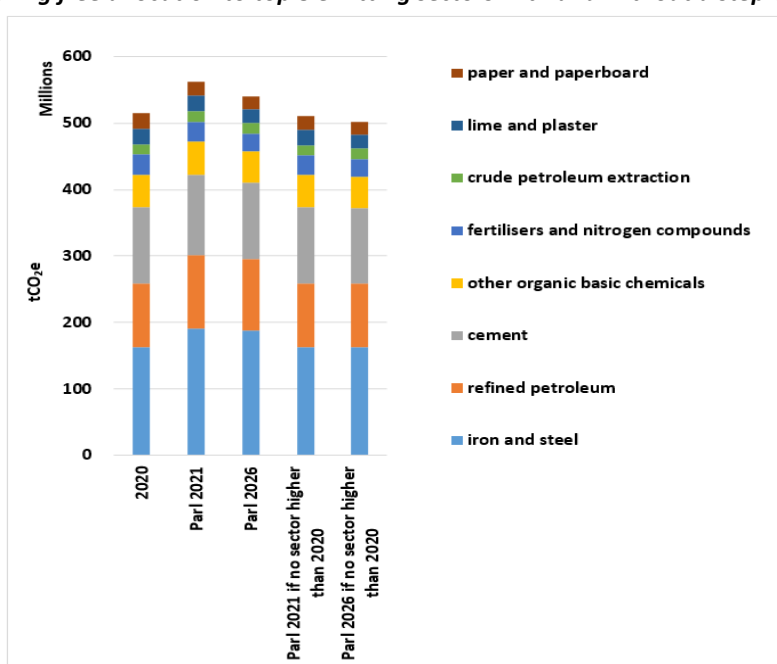
... and with no step-change upwards

Chart 2 below compares free allocations to the top 8 emitting sectors for 2020, for 2021 and 2026 under the Parliament position following the Plenary vote²³, and for 2021 and 2026 under a slightly modified approach. This is based on the Parliament position but applies the 2020 levels as maximum levels.

Sandbag estimates that if free allocation to sectors on the carbon leakage list were to continue at no higher than 2020 levels for Phase 4 (i.e. effectively applying a ratcheting approach where free allocations may only increase if activity levels increase) then at current activity levels:

- the total application for the phase would be reduced by approximately 450 million allowances,
- a CSCF could be avoided without decreasing the auction share, and
- there would still be approximately 200 million allowances left over which could be either cancelled or redirected to the MSR as a measure to reduce the market surplus.

Chart 2. Comparing free allocation to top 8 emitting sectors with and without a step-change upwards



2020 free allocation data from EUTL; 2021 and 2026 from Sandbag modelling

Sandbag recommends that a ratcheting approach should be applied for free allocation i.e. the direction of travel should only be downwards.

3 Flawed carbon leakage exposure metric

Article 10a Paragraph 14 of the current ETS Directive clearly states that the Commission should determine which sectors and subsectors need to be protected from carbon leakage risk by assessing:

“the extent to which it is possible for the sector or subsector concerned, at the relevant level of disaggregation, to pass on the direct cost of the required allowances and the indirect costs from higher electricity prices resulting from the implementation of this Directive into product prices without significant loss of market share to less carbon efficient installations outside the Community”.

²³ Binary carbon leakage protection 100%/0% but 30% for district heating; 55% auction share; all BM reductions -1% except NACE sectors 17.12 & 20.15 at -1.5% & 19.20 & 24.10 at -0.3%; NER from Ph4; 300 for InnovFund from Ph4 free alloc; 3% cap set aside for indirect cost comp (1/3 from free alloc); SME small emitters excluded

Box 1 below details how this was translated into a metric for carbon leakage exposure assessment to determine which sectors may receive free allocations up to 100% of their benchmarks. It also shows the new metric proposed for assessing carbon leakage.

Box 1: Carbon Leakage Assessment – Current and Proposed

Sectors or sub-sectors are currently assessed to be at risk of carbon leakage if:

- their carbon costs (direct and indirect) increase production costs, calculated as a proportion of the gross value added, by at least 5% **and** the sector's trade intensity with non-EU countries (imports and exports) is above 10%
- **or**, the sum of the carbon costs exceeds 30% of the production cost
- **or**, the trade intensity is above 30%
- **or**, other qualitative criteria are met

Post 2020, the Commission proposes to assess sectors or sub-sectors as at risk of carbon leakage if:

- the product of emissions intensity by trade intensity exceeds 0.2
- **or**, the product of emissions intensity by trade intensity exceeds 0.18 **and** other qualitative criteria are met

where,

- emissions intensity is measured in kgCO₂ per € gross value added

and,

- trade intensity is the ratio between the total value of exports to third countries plus the value of imports from third countries, and the total market size (annual turnover plus total imports from third countries)

An extensive 2015 report on ex-post investigation of cost pass-through in the EU ETS²⁴ (carried out for the Commission) observed that companies in sectors meeting the carbon leakage indicators in Box 1 (i.e. carbon costs relative to gross value added, and trade intensity) have nevertheless been able to pass-through carbon cost in product prices. The investigation included data for 2013 and 2014 (both years subject to the Phase 3 CSCF).

If sectors meeting the criteria to be included on the carbon leakage list do pass through carbon cost, this metric is clearly not appropriate for assessing ability to pass through carbon cost. In particular, applying the trade intensity measure is flawed because it doesn't take account of any carbon cost (direct or indirect through power prices) faced by the trading partner. The study concluded:

“Given the high relevance of empirical carbon cost pass through for devising a well-targeted carbon leakage and free allocation policy it is recommended to continue and intensify efforts to derive more solid estimates and indicators.”

Yet, the reform positions currently under Trialogue negotiation all remove the Article 10a Paragraph 14 reference to explicit assessment of carbon-cost-pass-through-potential when determining carbon leakage exposure. Sectors for which the product of emissions intensity and trade intensity does not

²⁴ CE Delft and Oeko-Institut, *Ex-post investigation of cost pass-through in the EU ETS: An analysis for six sectors (Nov 2015)* available [here](#)

exceed the binary threshold value are simply “considered to be able to pass on more of the cost of allowances in product prices”²⁵.

Despite calls by various ETS stakeholders to reduce the percentage of benchmark received by less exposed sectors (the so-called tiered approach), industry has successfully lobbied both Parliament and the ENV Council to maintain the binary threshold criteria proposed by the Commission. This means that sectors such as cement, with relatively low trade intensity, still meet the criteria to get 100% of benchmarked free allocation as they have a high enough emissions intensity to bring them across the binary threshold. Indeed, cement could have a trade intensity of less than 1%, i.e. have virtually no trade exposure, and still exceed the binary threshold criteria.

Industry associations have lobbied hard to convince policy makers that all sectors need a uniform 100% of benchmark once a threshold for inclusion on the carbon leakage list is reached. They have managed to persuade policy makers to take allowances away from Member States’ auctioning shares to ensure that as many sectors as possible can continue to receive 100% of benchmark across the whole phase. The late move in the Parliament negotiation to exempt some sectors from any CSCF²⁶ implies that sectors do not after all need the same level of protection.

Carbon leakage risk is not the same for all sectors meeting the carbon leakage exposure metric threshold

Sandbag agrees that carbon leakage risk is not the same for all sectors exceeding the 0.2 threshold.

Instead of taking allowances away from the auction share, we advocate that lower percentages of benchmark should be allocated to sectors with lower assessments of carbon leakage extent to make room under the free allocation share for sectors considered to be more highly exposed. As pointed out in various detailed studies on carbon leakage^{27 28 29}, different sectors operate with different margins and hence have different potential to absorb carbon cost without losing competitiveness. Sectors also have a different spreads of carbon intensity performance relative to their benchmark across all their participants. They also differ in their levels of product sameness (homogeneity) across different production regions making it easier or harder for competitors outside the scope of the ETS to offer no/low-carbon cost equivalent product. And, they have different potential for abatement with existing technology. (Differing potential for abatement is, to a certain extent, reflected in the different benchmark reduction rates across the sectors for Phase 4. This is intended to even out the potential to accumulate tradeable allowance assets when taking action to abate.)

In short, carbon leakage risk should not be confused with other competition factors.

Sandbag strongly recommends that further studies should be completed as soon as possible to establish more appropriate metrics for assessing carbon leakage risk than the product of emissions intensity and trade intensity: particularly in the context of changing international carbon pricing approaches. Sectors with low trade intensity should not be considered at risk of carbon leakage.

Sandbag also strongly disagrees with exempting a few sectors from any CSCF if free allocation is maintained at 100% of benchmark to all sectors remaining on the carbon leakage list. Instead, lower

²⁵ Article 10b Paragraph 3 (new)

²⁶ Parliament Amendment 71 to exclude from CSCF if emissions intensity $\Rightarrow$ 7kgCO₂/EuroGVA and trade intensity $\Rightarrow$ 15%; this captures Iron and Steel, Refined Petroleum, Fertilisers, Aluminium and Coke Oven Products

²⁷ IEA, Issues behind Competitiveness and Carbon Leakage: Focus on Heavy Industry (Oct 2008) available [here](#)

²⁸ PMR, Carbon Leakage: Theory, Evidence and Policy Design (Oct 2015) available [here](#)

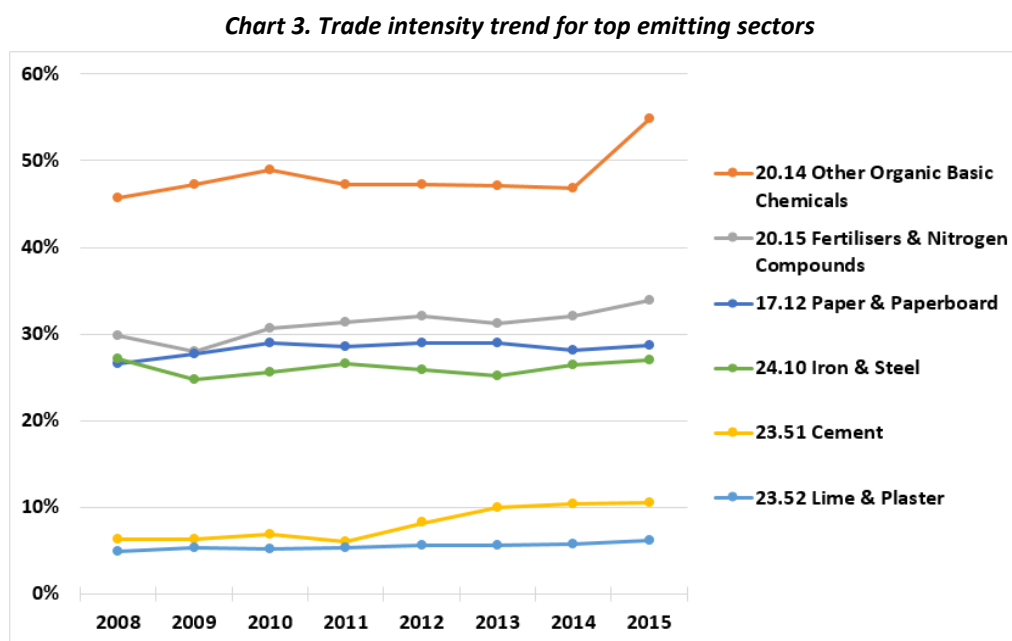
²⁹ CEPS, Carbon Leakage: Options for the EU p.46 (Mar 2014) available [here](#)

percentages of benchmark should be allocated to sectors with lower carbon leakage exposure in order to avoid, or at least delay, the need for a CSCF.

Trade intensity trends for top emitting industry sectors

Chart 3 below illustrates changes in trade intensity³⁰ since 2008 for the top emitting industry sectors (excluding NACE code 19.20 'Refined Petroleum' because the data is not available from the same source).

Cement's trade intensity has increased over the last 4 years but is still relatively low. With the exception of a sharp rise from 2014 to 2015 for 'Other Organic Basic Chemicals' and a small but steady rise since 2009 for 'Fertilisers and Nitrogen Compounds', trade intensity for most other sectors has remained more or less constant. All is not quite how it seems, however, so it is worth looking into the details of these changes. With the current trade intensity metric, higher exports can result in a higher trade intensity value even as imports are decreasing. Yet a sector with increasing exports and decreasing imports can hardly claim to be suffering from displacement of activity as a result of carbon costs not faced elsewhere.



Data on sold production, exports and imports from [Eurostat \(DS-056120\)](#); Sandbag calculations

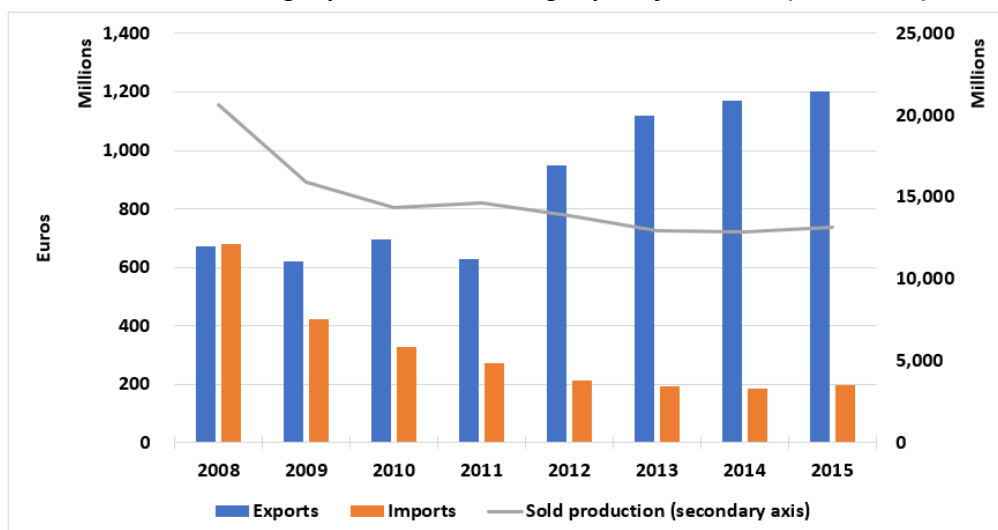
Cement is clearly not suffering carbon leakage exposure

Far from suffering from increasing competition from imports as the Phase 3 CSCF has taken hold and reduced free allocations, the EU cement sector has been successfully competing in export markets. Imports have decreased. This is clearly illustrated in Chart 4 below. (Please also refer to Sandbag's previous reports highlighting problems with free allocation to the cement industry³¹.)

³⁰ Trade intensity is the ratio between the total value of exports to third countries plus the value of imports from third countries and the total market size for the Union (total sold production plus total imports from third countries) expressed as a percentage

³¹ The Final Carbon Fatcat: How Europe's cement sector benefits and the climate suffers from flaws in the Emissions Trading Scheme (Mar 2016) available [here](#); Cement Exposed: What now for the ETS Fatcat? (Oct 2016) available [here](#); The Cement Industry of the Future: How Border Adjustment Measures can enable the transition to a low-carbon cement industry (Jan 2017) available [here](#)

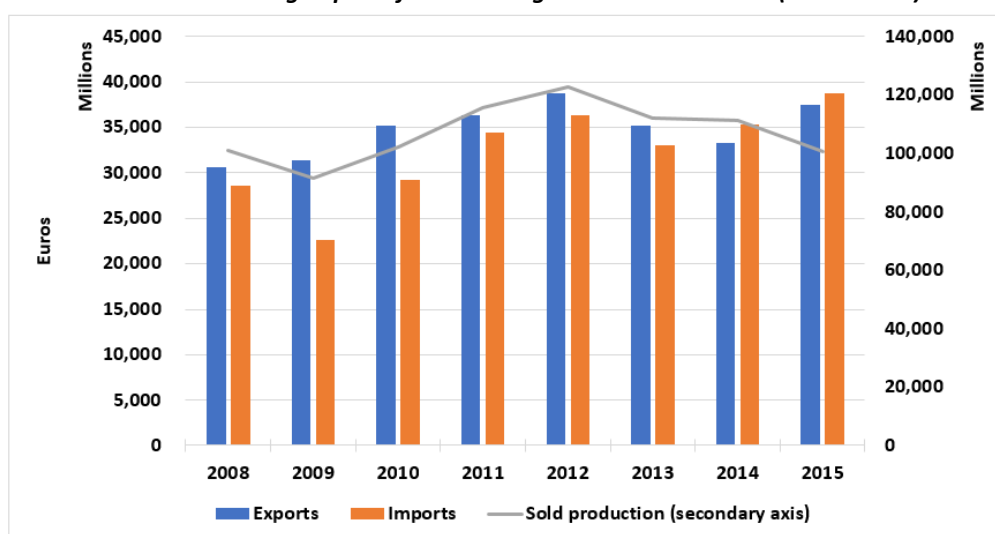
Chart 4. Increasing exports and decreasing imports for Cement (NACE 23.51)



Data from [Eurostat \(DS-056120\)](#)

By contrast, imports have increased for ‘Other Organic Basic Chemicals’ for which trade intensity increased significantly year over year from 2014 to 2015. Yet, even this sector increased its exports as part of this trade intensity increase, as can be seen in Chart 5 below.

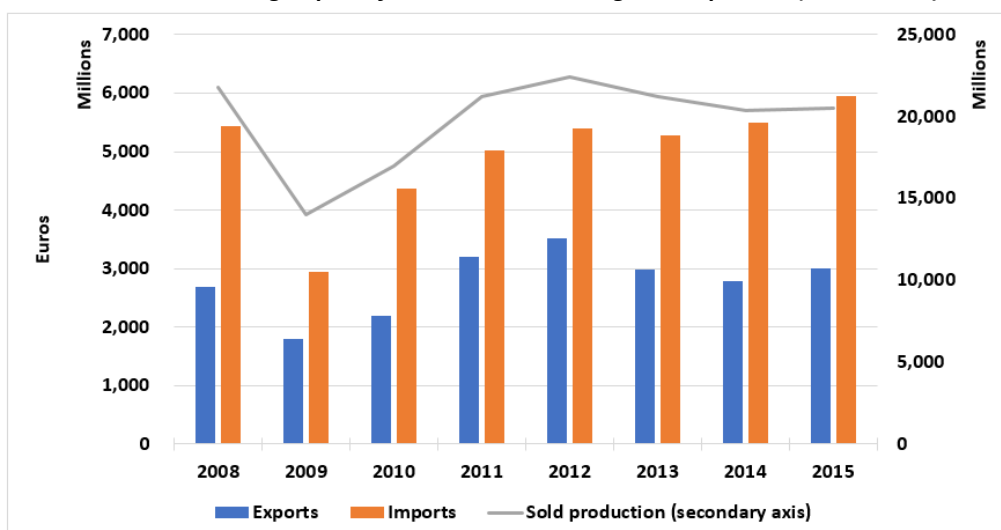
Chart 5. Increasing imports for Other Organic Basic Chemicals (NACE 20.14)



Data from [Eurostat \(DS-056120\)](#)

Of the three highlighted sectors with increased trade intensity, only the ‘Fertilisers & Nitrogen Compounds’ sector (which has traditionally had high imports) has increased its trade intensity primarily due to increased imports. See Chart 6 below. Imports continue to rise even as total sold production decreases.

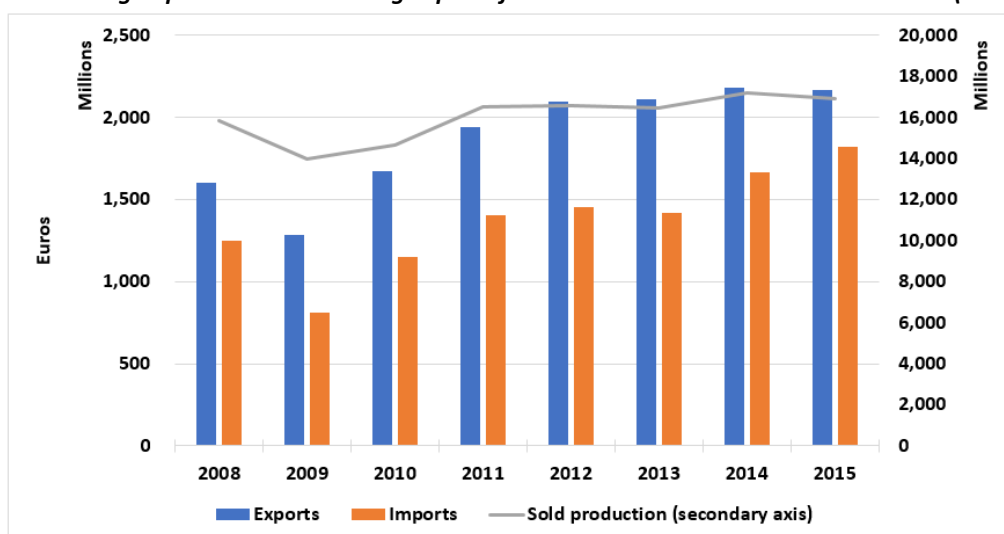
Chart 6. Increasing imports for Fertilisers & Nitrogen Compounds (NACE 20.15)



Data from [Eurostat \(DS-056120\)](#)

In contrast to the above sectors which are all set to continue receiving 100% of benchmark, the ‘Other Non-Metallic Mineral Products’ sector (which despite having double the trade intensity of cement, has low emissions intensity and therefore does not meet the threshold for inclusion on the carbon leakage list) is likely to receive either 30% or 0% of benchmark depending on which position is adopted following the Trialogue negotiations. Yet, as seen in Chart 7 below, this sector appears to be starting to lose out to imports. Other factors than carbon cost appear to be influencing this sector’s competitiveness.

Chart 7. Increasing imports with decreasing exports for Other Non-Metallic Mineral Products (NACE 23.99)



Data from [Eurostat \(DS-056120\)](#)

4 Keeping carbon costs in perspective

We should not look to carbon cost avoidance to make up for other competition factors. Carbon cost is just one competition factor among many. These include:

- Market demand and access in faster growing developing regions
- Currency strength
- Labour costs and labour productivity
- Raw materials costs
- Wholesale power costs and network costs
- Efficiency and age of plant
- Alternative materials technology development
- Capacity levels and freight costs
- Effectiveness of trade laws to protect against unfair practices such as dumping
- Regional stability and legal/institutional frameworks

Industry in EU Member States competes by adding more value, not just by being cheaper. Whilst acknowledging data availability challenges and methodological difficulties, most ex-post studies into the impact of carbon cost on industry competitiveness (i.e. those based on actual results rather than forecasts) have not found a causal relation between carbon pricing and competitiveness³².

In the EU, cost components such as raw materials, labour and others or feedstock have been found to contribute more to final costs than energy³³. Furthermore, ‘credits’ such as by-products, home scrap, and electricity production from waste gases or for combined heat and power, reduce production costs more in the EU than elsewhere.

5 Unequal carbon cost (cumulative balance) between industry sectors and countries

The following heat map tables illustrate the differing carbon cost faced by industry, not only from industry sector to industry sector but also between different Member States for the same industry sectors. The deeper the blue of the shading, the more positive the cumulative balance³⁴ i.e. the higher the potential windfall profit to the industry sector if they choose to sell their spare allowances. The deeper the red of the shading, the more negative the balance i.e. the higher the carbon cost to the industry sector.

Important:

We have not included the impact of international credits (offsets) on these balances. Offsets are, in effect, additional supply that can be acquired at much lower prices than ETS allowances and different companies may have managed their offset entitlements differently. However, we would like to point out that including offset use in the balance calculation would significantly reduce the overall costs faced by covered entities.

The balance calculations also do not take allowance transfers into account. Balances for the iron and steel sector, where some waste gases are transferred to third parties for combustion to generate electricity

³² OECD, *Impacts of Carbon Prices on Indicators of Competitiveness: A Review of Empirical Findings* p.8 (Mar 2015) available [here](#)

³³ JRC Science for Policy Report, *Production costs from energy-intensive industries in the EU and third countries* (2016) available [here](#)

³⁴ Cumulative balance = cumulative free allocations - cumulative emissions (NB: use of international credit offsets not included)

rather than being used on-site for the same purpose, may be overstated (i.e. made more positive). Sandbag is also aware of allowance transfers from the paper and paperboard sector. However, installations with allowance transfers are likely to be benefiting from favourable power purchase arrangements in return.

Table 1 shows the actual cumulative balances from 2008 to 2015. Table 2 shows projected cumulative balances from 2008 to 2020 and Table 3 compares projected cumulative balances from 2008 to 2030 for the three positions (Commission, Parliament and ENV Council – see previous footnotes 16,17 and 18). All projections assume no changes from current activity levels and, to avoid adding further complexity to the modelling, the projections also assume no changes in emissions intensities from current levels. This, it is to be hoped, is unrealistic and balances are likely to be more positive than projected here. After all, the whole aim of the ETS is to stimulate least cost abatement. Participants that do make steep emissions cuts faster than their peers should be rewarded with a tradeable asset.

Continued allowance surpluses in some areas

Protection from carbon leakage risk is supposed to be the only reason for continued free allocation to industry sectors covered by the EU ETS. Yet in several areas, highly emitting sectors maintain positive cumulative balances (or at least not very negative balances) right out to the end of Phase 4.

To a certain extent, differences in cumulative balances are likely to be related to the legacy of the current rules on partial cessation of activities³⁵ when combined with different declines in production during the recent deep economic recession. There may also be differences due to differing progress on reducing carbon intensity of activities. However, considering that we need a price signal for all industrial sectors to encourage abatement investment if we are to reach our long-term abatement goals, it hardly seems fair that in some countries some industry sectors will still have received more free allocations than needed to fully cover verified emissions - a quarter of a century after the start of this policy.

Sandbag's analysis on total system supply and demand illustrates that the system will continue to be massively oversupplied near and mid-term³⁶. The opportunity to realign the start of the Phase 4 cap to current emissions levels as a measure to correct the architecture of the ETS has almost, but not quite completely, slipped away. The ENV Council's position does allow for a significant reduction in the total size of the cap as it introduces retirement of allowances from the MSR, equivalent to the previous year's auctioned amount, from 2024 onwards. However, Sandbag calculates that while such cancellation from the MSR would be a very positive step, even the ENV Council's package would not affect the surplus on the market until at least the early 2030s (under our base case emissions scenario) or until the early 2040s (under our low emissions scenario).

However, as can be seen in Table 4, if free allocation is targeted to the sectors most exposed to carbon leakage risk, it is possible to realign the start of the Phase 4 cap to current emissions levels without excessive additional carbon cost to industry.

Sandbag has consistently advocated realigning the start of the Phase 4 cap with actual emissions levels throughout this reform process. We strongly urge Trialogue negotiators to reconsider this option.

³⁵ Free allocations are not reduced until activity levels drop below 50% of historical activity levels, see Article 23 of the [Benchmarking Decision \(2011/278/EU\) \(75-50% activity red → 50%FA, 90-75% activity red → 25% FA, 100-90% activity red → 0% FA\)](#)

³⁶ Any Port in a Storm: Recommendations for the ETS reform in Trialogue (Mar 2017) available [here](#)

Legend for heat map tables

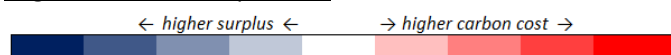


Table 1. Cumulative balances from 2008 to 2015 – most sectors in balance or with surplus

cumulative balance (free alloc - emi) 2008 to 2015	24.10 iron & steel	19.20 refined petroleum	23.51 cement	20.14 other organic basic chemicals	20.15 fertilisers & nitrogen compounds	06.10 crude petroleum extraction	23.52 lime & plaster	17.12 paper & paperboard	rest
Austria									
Belgium									
Bulgaria									
Croatia									
Cyprus									
Czech Republic									
Denmark									
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Slovakia									
Slovenia									
Spain									
Sweden									
United Kingdom									

Data from EUTL; Sandbag calculation

Table 2. Projected cumulative balances from 2008 to 2020 – a few more sectors facing carbon cost

projected cumulative balance (free alloc - emi) 2008 to 2020	24.10 iron & steel	19.20 refined petroleum	23.51 cement	20.14 other organic basic chemicals	20.15 fertilisers & nitrogen compounds	06.10 crude petroleum extraction	23.52 lime & plaster	17.12 paper & paperboard	rest
Austria									
Belgium									
Bulgaria									
Croatia									
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Czech Republic									
Denmark									
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Poland									
Portugal									
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Slovakia									
Slovenia									
Spain									
Sweden									
United Kingdom									

Data from EUTL; Sandbag calculation

NB: Strong negative balance for Norway crude petroleum extraction relates to Norwegian Government decision not to freely allocate allowances in Phase 2 to most installations in this sector.

Table 3. Projected cumulative balances from 2008 to 2030 – side by side comparison of 3 positions – slightly more positive balance for the top emitting sectors and more carbon cost for other sectors under the Parliament position

projected cumulative balance (free alloc - emi) 2008 to 2030	24.10 iron & steel			19.20 refined petroleum			23.51 cement			20.14 other organic basic chemicals			20.15 fertilisers & nitrogen compounds			06.10 crude petroleum extraction			23.52 lime & plaster			17.12 paper & paperboard			rest		
	Comm	EP	Council	Comm	EP	Council	Comm	EP	Council	Comm	EP	Council	Comm	EP	Council	Comm	EP	Council	Comm	EP	Council	Comm	EP	Council	Comm	EP	Council
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Belgium																											
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United Kingdom																											

2008 to 2020 data from EUTL; post-2020 free allocations from Sandbag modelling; Sandbag calculation

Table 4. Projected cumulative balances from 2008 to 2030 – side by side comparison of Parliament position and a ‘rebased’ approach with ‘tiering’ (which could remove over a billion surplus allowances)

projected cumulative balance (free alloc - emi) 2008 to 2030	24.10 iron & steel		19.20 refined petroleum		23.51 cement		20.14 other organic basic chemicals		20.15 fertilisers & nitrogen compounds		06.10 crude petroleum extraction		23.52 lime & plaster		17.12 paper & paperboard		rest	
	Parliament	Rebased with tiering	Parliament	Rebased with tiering	Parliament	Rebased with tiering	Parliament	Rebased with tiering	Parliament	Rebased with tiering	Parliament	Rebased with tiering	Parliament	Rebased with tiering	Parliament	Rebased with tiering	Parliament	Rebased with tiering
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Spain																		
Sweden																		
United Kingdom																		

2008 to 2020 data from EUTL; post-2020 free allocations from Sandbag modelling; Sandbag calculation

Rebased from 1,689Mt to reduce overall Ph4 cap by 1,271Mt

Tiered carbon leakage protection with 100% of benchmark for ≥ 2.5 carbon leakage assessment, 80% for ≥ 1.0 , 60% for ≥ 0.15 , 0% for the rest, 30% for district heating
3% cap set aside for indirect cost comp (1/3 from free alloc); SME small emitters excluded

6 Better approaches for avoiding displacement of EU industrial activities

Enhanced funding support for low carbon innovation

Adding value and product differentiation is crucial for EU competitiveness. Industry sectors covered by the ETS have very long-term investment cycles with high potential for technology lock-in. Retrofitting existing plant to apply Best Available Technologies for emissions abatement is also expensive. Long-term industrial investment must be stimulated to support breakthrough low carbon technologies. However, according to the European Parliament's [Innovation Policy Factsheet](#):

"Europe spends 0.8% of GDP less than the US and 1.5% less than Japan every year on research and development (R&D)."

"Although the EU market is the largest in the world, it remains fragmented and is not sufficiently innovation-friendly."

The Commission and Council positions specify 450 million allowances for the ETS's Innovation Fund. Parliament's position raises this to 650 million allowances. At today's prices of around €5/tonne, these positions translate to €2.2 or 3.2 billion. A €20/tonne price would raise €9 or 13 billion. However, to put these sums in perspective, just one transformative technology for steelmaking, Top Gas Recycling Blast Furnace (TGR-BF) with Carbon Capture and Storage (CCS) technology, for just the UK would cost close to €3 billion³⁷. According to industry body Eurofer³⁸, this technology, still to be proven as technically feasible at industrial scale, provides the most promising abatement potential for steelmaking. Reform positions which increase the size of the Innovation Fund or which direct auction revenues to support investments in innovative technologies are very welcome but clearly much more innovation finance needs to be stimulated.

The EU Innovation Union has been established to stimulate innovation, with the [Horizon2020](#) programme as its main instrument for implementation. The [Investment Plan for Europe](#), supported by a [European Fund for Strategic Investments \(EFSI\)](#), also aims to boost investment, increase competitiveness, and to support long-term economic growth. Such funds are intended to build on current research and development expertise and to catalyse engagement of private finance for innovative new technologies. Additional approaches to stimulate private capital for low carbon investment, with strict criteria to ensure that any public spending is consistent with emissions abatement goals, are needed to help develop and keep low carbon technology clusters here in the EU.

Creating demand pull for low carbon materials to encourage low carbon innovation

EU policy makers could create demand pull for low carbon materials in Europe by imposing steadily declining carbon intensity limits for industry products sold or used in the region, starting with projects involving public finance. Such standardisation could be introduced via regulations such as Regulation (EU) No 305/2011 for construction products. A recent report on construction sector views on low carbon building materials highlighted the need for new regulatory drivers to complement changing attitudes if embodied carbon is to be established as a mainstream construction industry concern³⁹. Such approaches would address market-seeking investment patterns of multinational companies.

³⁷ Centre for Low Carbon Futures report for UK's Trades Union Congress (TUC) and Energy Intensive Users Group (EIUG) p.13 (2011) available [here](#)

³⁸ Press release, Eurofer presents Steel Roadmap for a Low Carbon Europe 2050 (Jul 2013) available [here](#)

³⁹ Building Research and Information, Construction sector views on low carbon building materials (2016) available [here](#)

Improved trade laws and product standards related to emissions intensity

Regulation to create low carbon demand pull in the EU would not necessarily fall foul of the World Trade Organisation (WTO) and the General Agreement on Tariffs and Trade (GATT). EU efficiency and eco-labelling regulations already restrict some imports. A 2011 staff working paper of the WTO suggested a sub-group of the WTO membership could develop climate change related international standards⁴⁰. The European Committee for Standardisation (CEN) TC264/WG33 is already working on a standard for the determination and assessment of greenhouse gas emissions from energy-intensive industries. This work could support establishment of internationally recognised carbon intensity standards to facilitate an import inclusion approach for products in sectors covered by the EU ETS.

Timely response to specific unfair trade issues

Revision of EU legislation on protection against dumping and subsidised imports from countries not members of the EU is currently at the committee stage of the co-decision procedure⁴¹. The revision was at least in part prompted by complaints from the iron and steel sector about unfair competition from China. Ensuring that EU legislative bodies respond in a timely manner to specific trading issues is crucial for avoiding displacement of EU industrial activities.

7 Policy uncertainty is delaying investment signals

Important decisions on the detail of the ETS are due to be addressed in later Delegated Acts. Issues such as those listed below all have a material impact on the functioning of the system.

- Confirming the pace of benchmark reductions per sector
- Confirming exactly which sectors and subsectors will be on the carbon leakage list post-2019/2020
- Confirming the criteria to be used to assess adjustment to allocation levels to take account of relevant increases and decreases in production
- Assessing potential of Import Inclusion Systems (IIS) to address leakage
- Reviewing the effective functioning of the Market Stability Reserve (MSR)
- Assessing potential for a Linear Reduction Factor increase during the Phase (Parliament position includes option to increase in 2024)

Even after the ink dries on the Phase 4 Reform (hopefully later this year), industrial participants will still not know for certain how many free allocations they can expect to receive in just 4 years from now. Current modelling by various stakeholders, including ourselves at Sandbag, is all based on assumptions. A small change in the pace of benchmark reduction for a major sector will have a high impact on the total application for benchmarked free allocations, with knock-on effects on the availability of free allocations for other sectors. Yet the benchmarks have not yet been decided for Phase 4. Under both the Parliament and the ENV Council positions, benchmarks for even the first half of the Phase 4 are not likely to be known until very close to the start of the phase given that they are to be calculated from data to be collected after the close of the current compliance year.

Policy uncertainty on free allocation levels, combined with allowance price forecast uncertainty, leaves industries unable to plan for carbon cost avoidance. Uncertainty on carbon cost adds risk to returns on investment in abatement which in turn results in increased financing costs. Right now, and even with

⁴⁰ WTO Economic Research and Statistics Division, *The Interface Between The Trade And Climate Change Regimes: Scoping The Issues* p.26 (2011) available [here](#)

⁴¹ Amending Regulation (EU) 2016/1036 on protection against dumped imports from countries not members of the European Union and Regulation (EU) 2016/1037 on protection against subsidised imports from countries not members of the European Union; see European Parliament Legislative Observatory [here](#)

the current reform positions being negotiated in Trialogue, ETS policy uncertainty is likely to be delaying abatement investment.

With long-term investment cycles, industry needs policy certainty now. In the spirit of the Paris Agreement's ratcheting approach for tightening targets, the direction of travel should be clear. Free allocation levels should not increase over time and allowance supply should be attenuated to demand to maintain a steady predictable increase in the allowance price.

Sandbag recommends that decisions on annual benchmark reduction levels, and other details influencing free allocation to industry, should be made without delay based on currently available data.

8 Reform implications

The ETS isn't intended to be a subsidy to encourage multinationals to stay in Europe. Free allocation can't compete with other competition factors. But, being ahead of the game in terms of low carbon innovation could become a reason to stay and invest in Europe or even to relocate here.

We need to ensure that the Phase 4 Reform encourages best practices to spread faster and more widely. Delaying strong clear policy signals is making it harder for willing industrial participants to justify abatement investment to their financial controllers and investors. We need a radical overhaul to the architecture of the ETS yet the current reforms are merely tinkering round the edges.

A predictably rising carbon price signal would make abatement projects financially more attractive. However, under the policy positions currently on the table, even laggards will be rewarded with higher free allocation levels in Phase 4 than received at the end of Phase 3. Why invest if you can successfully lobby for higher free allocations which in turn hampers efforts to tighten overall supply and hence further depresses the cost to emit?

Sandbag recommends the following for getting the abatement investment signals right whilst addressing the carbon leakage conundrum:

- ***A ratcheting approach should be applied for free allocation i.e. the direction of travel should only be downwards. The allowances freed up by this approach could be used to avoid reduction to the auction share or added to the Innovation Fund or redirected to the Market Stability Reserve or, better still, permanently cancelled.***
- ***Decisions on annual benchmark reduction levels, and other details influencing free allocation to industry during Phase 4, should be made without delay based on currently available data.***
- ***Explicit assessment of carbon-cost-pass-through-potential should determine carbon leakage exposure. There should be no sectors still with significant positive allowance balances during Phase 4 (unless they have significantly reduced their emissions intensities). If trade intensity is to continue as part of the assessment of carbon leakage exposure, this metric should be adjusted to take into account the direction of trade.***
- ***EU policy should focus on strengthening innovation support and stimulating private capital flows to low carbon innovation clusters to combat carbon leakage rather than relying on free allocation. Trade agreements should be strengthened to reduce unfair competition unrelated to carbon price.***

- ***The potential to replace free allocation with full auctioning accompanied by Import Inclusion Systems as the primary measure for protection against carbon leakage should be assessed as soon as possible.***

And, most importantly,

- ***Dialogue negotiators should reconsider the option to realign the start of the Phase 4 cap with actual emissions levels in order to rebalance overall supply to demand.***

Unfortunately, the ETS reform options currently being discussed at the Dialogue stage do not resolve the carbon leakage conundrum. Further policy interventions are likely to be required to take advantage of EU research and development strengths, support break-through low carbon innovation and maintain EU industry competitiveness in an increasingly carbon constrained world economy.



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Full information on Sandbag and our funding is available on our website sandbag.org.uk

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Whilst every attempt has been made to be as accurate and precise as we can given the data available to us, the information in this report is based on in-house modelling and as such is, at best, our interpretation of this data.

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