

Last Chance Saloon for the EU ETS

Modelling Phase 4 reform options



sandbag

Summary

The EU's Emissions Trading System (ETS) is currently not fit for purpose. A huge surplus of emissions allowances has accumulated¹ even after the 2014 intervention to delay the supply of some allowances to the end of the current phase². Trading to find least cost abatement is only meaningful if the emissions allowances have a consistently high enough price³ to dislodge carbon intensive incumbent technologies and stimulate timely investment in modern, resource-efficient, low carbon technologies⁴.

The focus of the post 2020 EU ETS reform should be on how to address this surplus issue and rebalance supply to demand in order to encourage appropriate price signals – all whilst ensuring sufficient on-going free allocation reaches industry sectors that genuinely need it. However, the Commission's Reform Proposal⁵ does not address the surplus issue. It also does not address concerns from industry about the application of a uniform cross-sectoral correction factor (CSCF)⁶ to bring free allocation of allowances within the maximum allowed. The Phase 3 CSCF has proved a major concern because it means that even the most efficient participants have received a lower than benchmarked free allocation.

The EU ETS is complex with many variables working in combination to determine the maximum number of allowances available under the cap and their distribution across the system's participants. It is difficult for legislators and other stakeholders to decide which reform proposals to support without an in depth understanding of their impact on the cap and its distribution. Avoiding a CSCF is at the heart of the debate on Phase 4 reforms.

Sandbag has built a model to help find a way through this complexity and to compare different combinations of reform choices. We have used the Commission's Proposal as a starting point and compared amendments proposed by the European Parliament's lead committee for the reform, the Environment Public Health and Food Safety Committee (ENVI). The Commission's Proposal

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

¹ 1,827MtCO₂e at end 2015 (free allocation+auctioned+offsets-emissions)

² See link [here](#) on Backloading

³ Sep2016 auction price is below €5/tCO₂e; Commission Decision for 2015 to 2019 carbon leakage list applies an assumed carbon price of €30/tCO₂e

⁴ Examples of abatement potential include coal to gas power generation fuel switching, enhanced heat and gas recovery and dry coke quenching in steel making, clinker substitution in cements, carbon capture and storage (CCS)

⁵ See link [here](#)

⁶ Article 10a (5); factors set out in Annex II of Commission Decision (2013/448/EU)

does not address coverage of the aviation sector in the EU ETS so our modelling only covers stationary installations. The aviation sector is outside the scope of this report.

Section 2 of this report introduces the main variables. Sections 3 and 4 address each of these in turn and compare variable settings. Section 5 provides examples of targeted distribution options which allow for activity growth whilst avoiding a CSCF and which allow room for variable settings to reduce the surplus.

As a result of this detailed modelling, Sandbag recommends the following reform choices to tame the surplus whilst avoiding a CSCF:

- ***use a targeted rather than binary approach for carbon leakage protection,***
- ***realign the 2020 starting point for calculating the Phase 4 cap (to reflect the reality of where emissions have reached),***
- ***take all Phase 4 New Entrant Reserve (NER) allowances from the Phase 4 cap (to avoid augmenting Phase 4 with surplus Phase 3 allowances),***
- ***retire unallocated Phase 3 allowances, or at least leave them in the Market Stability Reserve (MSR),***
- ***take all Innovation Support allowances from the auction share of the Phase 4 cap,***
- ***increase the auction share in the event of comparative efforts for mandatory emissions reductions outside the EU ETS region.***

Furthermore, to enable appropriate public scrutiny of the EU ETS, we recommend that the EU Transaction Log should be enhanced to share:

- regular updated mappings of installations to NACE⁷ sector codes,
- information on allowance transfers related to heat and gas transfers.

We also recommend that carbon leakage assessment criteria should be kept under constant scrutiny relative to comparative efforts for mandatory emissions reductions outside the EU ETS region.

⁷ NACE is the “statistical classification of economic activities in the European Community” and is the subject of legislation at the EU level, which imposes the use of the classification uniformly within all member states

About this report

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The author gratefully acknowledges the large contribution made by Alex Luta to the calculation work used to identify the Phase 3 benchmarked free allocation applications during his time at Sandbag. This work also identified installations with partial cessation and installations receiving allocations related to district heating and/or Combined Heat and Power (CHP).

If you would like to see the impact of specific model settings not explored in this report, please do not hesitate to contact the author at tricia@sandbag.org.uk.

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1 Background

The purpose of the EU ETS is to “*promote reductions of greenhouse gas emissions in a cost effective and economically efficient manner*”⁸. However, a fixed schedule of allowance supply is exceeding, by far, market demand from industrial and power sector participants. The 2008 financial crisis led to significantly lowered industrial activity levels and hence reduced the demand for emissions allowances. At the same time, efficiency improvements and rapid renewable power generation deployment driven by other EU policies have delivered faster than anticipated emissions reductions. EU emissions are unlikely to rise to the levels necessary to consume the huge surplus of allowances⁹ that has been building up over the current and previous trading phases.

As we illustrate in our recent reports, [‘Stabilising the EU ETS’ Market Stability Reserve: How to tackle the MSR’s obesity problem’](#) and [‘Getting in touch with reality: Rebasing the EU ETS Phase 4 cap’](#), even the Market Stability Reserve (MSR) mechanism, which is due to start pulling in allowances from the auctioned share of the EU ETS cap from 2019, is not expected to reduce the surplus at the pace required to stimulate investment for near to mid-term technology change.

Auctioning is the intended default method of releasing allowances to the market¹⁰. So, as well as steadily reducing the total cap on emissions allowances each year, the current EU ETS aims to shift the method of distributing the allowances amongst the participants from free allocation to auctioning. With a few exceptions related to supporting modernisation of electricity supply in some member states, power sector participants no longer receive any free allocation. Instead, they buy their allowances either from specifically appointed auction platforms or via other trading. Free allocations to industrial participants are reduced year by year.

However, industry in Europe faces stiff competition from countries outside the region and there is little environmental benefit to be gained if industrial emissions that would have been released in Europe are instead released in other countries at maybe even higher levels. So, the EU ETS sets out to insulate sectors considered to be at significant risk of displacement to areas without carbon pricing from the EU’s carbon price. Such displacement is commonly referred to as “*carbon leakage*”. For carbon leakage exposed industry sectors, free allocations are left at 100% of harmonised benchmarked levels.

Since the start of the EU ETS, participants not considered to be at risk of carbon leakage have also been given free allocations to allow them time to adjust their businesses to take account of newly internalised emissions costs. In Phase 3, their free allocations are steadily reduced from 80% of the benchmark at the start of the phase to 30% at the end.

⁸ Article 1 current ETS Directive

⁹ 1,827MtCO₂e at end 2015 (free allocation+auctioned+offsets-emissions)

¹⁰ http://ec.europa.eu/clima/policies/ets/auctioning/index_en.htm

Unfortunately, with the current binary approach for assessing carbon leakage exposure and extent of exposure (on or off, exposed or not exposed) the sum of free allowances requested by industry under the benchmarks for Phase 3 exceeds the maximum number available under the cap. So, the free allocations to **all** participants are reduced by a cross-sectoral correction factor (CSCF) each year to ensure that the amount of total free allocation remains within its limit. This means that the current distribution approach for free allocations is failing to ensure that carbon leakage exposed best performers receive the full benchmarked allocation for their activity levels at the time of the free allocation applications.

Even though the Phase 3 CSCF is applied uniformly across all sectors, it has hit some industry sectors harder than others. The top two NACE sector recipients of free allocations¹¹ (currently receiving just over 40% of the available free allocation) have still received many more allowances than they have needed to cover their emissions so far¹². Other highly emitting NACE sectors have been less fortunate¹³, maybe through having maintained activity levels closer to the activity levels originally anticipated for Phase 3 or possibly because they have been less innovative with regards to emissions reductions after the original establishment of their benchmarks.

For as long as comparable efforts to internalise the cost of GHG emissions are not established in major economies outside Europe, EU ETS rules will still need to allow for some ongoing free allocation to some industry sectors genuinely at risk of carbon leakage. However, as Sandbag has illustrated in numerous reports¹⁴, over-allocation of free allowances has been the norm so far and carbon prices have been nowhere near the price assumed when assessing the carbon leakage status of EU industry sectors.

2 Sandbag's model

Table 1 below lists the parameters (variables) involved in determining the number of free allocations available to industry sectors and how they are distributed. It describes how these parameters can be adjusted in our model and shows the parameter settings in the Commission's Proposal.

¹¹ 24.10 Manufacture of basic iron and steel and of ferro-alloys; 23.51 Manufacture of cement

¹² This situation is less clear cut for 24.10 Iron & Steel due to waste gas transfers

¹³ 19.20 Manufacture of refined petroleum products; 20.13, 20.14 & 20.15 combined all in NACE group Manufacture of basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms

¹⁴ [The Final Carbon Fatcat: How Europe's cement sector benefits and the climate suffers from flaws in the Emissions Trading Scheme \(Mar2016\)](#); [The Eternal Surplus of the Spineless Market: Why the carbon price will remain low even with a strong MSR \(Mar2015\)](#); [Slaying the Dragon: Vanquish the surplus and rescue the ETS \(Oct2014\)](#); [Carbon Fatcat Companies in Greece \(Feb2013\)](#); [Klimaqoldesel 2013: Carbon Fatcat Companies in Germany \(Feb2013\)](#); [Carbon Fatcat Companies in Belgium: Bending the carbon rules in the heart of Europe \(Nov2012\)](#); [Czech Fatcats \(Jun2012\)](#); [Carbon Fatcats 2011: The companies profiting from the EU Emissions Trading Scheme \(Jun2011\)](#)

Opinions vary widely amongst the ENVI MEPs on which parameter settings should be adopted, as seen in the numerous amendments to the Commission’s Proposal submitted for debate within the committee. The report sections below summarise the amendments for each parameter and explore the impact on the distribution of allowances.

Table 1. Description of parameters, Commission Proposal settings and model options

Parameter	Short Description	Commission Proposal	Model Options
Influencing maximum number of allowances available for free allocation			
Linear Reduction Factor	% value of rescoped 2010 emissions determining how much reduce overall cap each year	2.20%	user input of %
Start value for LRF	start value from which reduce LRF amount year over year	continue from 2020 cap	toggle between continue from 2020 cap and user input of new end Ph3 start point
Auction share	% value of Ph4 cap	57%	user input of %
Innovation Support	number and source of allowances set aside for Innovation Support	400 million from free allocation share	user input of number to take from free allocation share
New Entrants Reserve	source of allowances set aside for New Entrants Reserve	150 million leftover unallocated Phase 3 allowances plus 250 million Phase 3 allowances taken from MSR	toggle between source from Ph3 or Ph4
Influencing distribution of maximum available across industry sectors			
Binary or targeted Carbon Leakage protection	% of benchmarked free allocation to allocate for carbon leakage measure value; binary approach has just 1 threshold (exposed or not exposed), targeted approach has more thresholds	binary with 100% allocation above threshold and 30% below	user input of carbon leakage threshold values and %s of benchmark to allocate for up to 4 thresholds
Carbon Leakage measure	product of emissions intensity and trade intensity (plus other qualitative assessments)	single threshold of 0.2	behind the scenes adjustment of (Total C costs)/GVA and trade intensity; not easily changeable by model users
Benchmarks	approach followed to reset benchmarks applied to sectors to reflect decarbonation since originally setting the benchmarks	-1% benchmark reductions per NACE code with some exceptions at -0.5% or -1.5%	toggle between -1%, -0.5% or -1.5% applied economy wide; or, user input of % reduction per NACE code or for all NACE codes
Activity Levels	assumed growth from 2015 levels to value for benchmarked allocation for 1st half Ph4 and to value for benchmarked allocation for 2nd half Ph4	no set value; recalculate every 5 years based on data for 5 prior years	toggle between user input of single % growth value applied economy wide; or, user input of specific % values per NACE code

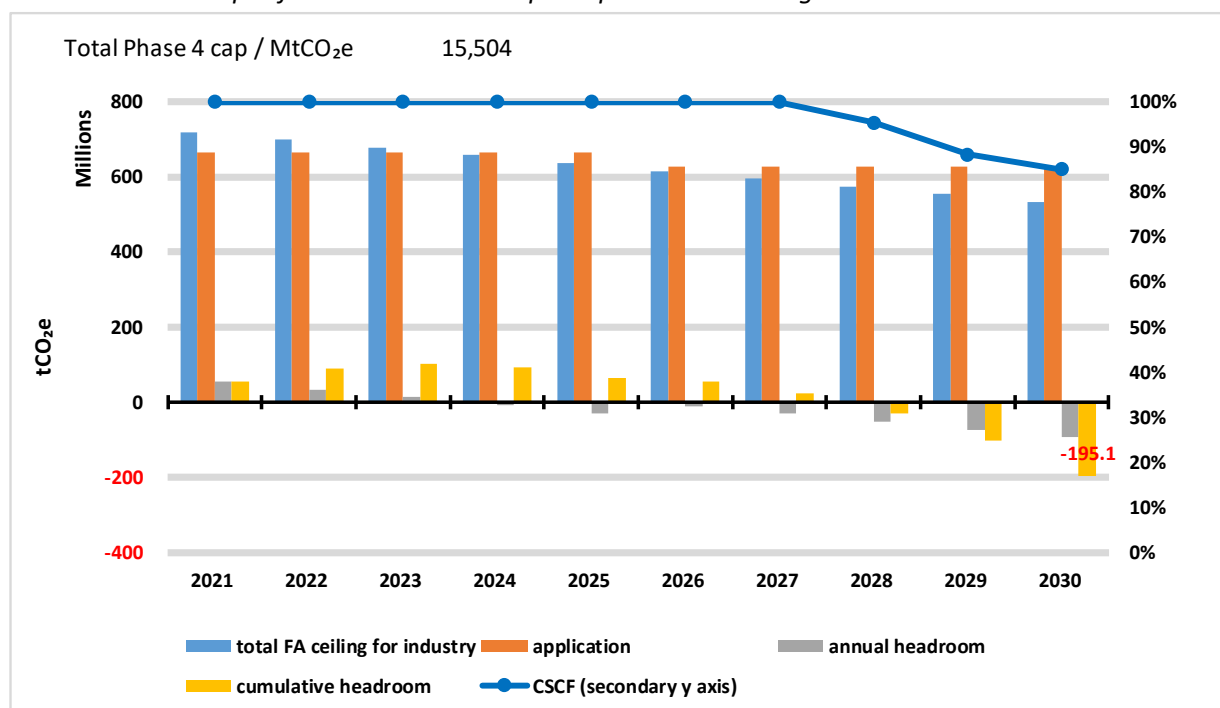
Sandbag’s modelling shows that with careful selection of Phase 4 allowance distribution parameters, free allocations to industrial participants can be kept within the maximum number available - even for significant industrial growth and a tightened cap.

2.1 Commission's Proposal (triggers CSCF)

Unless there is a considerable decline in activity levels in a few key large NACE sectors, free allocation applications under the parameter settings in the Commission's Proposal for Phase 4 reform will most likely again exceed the ceiling on allowances available for industrial participants.

A CSCF will be triggered in the second half of Phase 4 and will rapidly become stronger over the following years. This is illustrated in Chart 1 below. The CSCF is plotted on the secondary y-axis. A value of 100% means that applications are not reduced. A value of 80% means all sectors have their benchmarked allocation reduced to 80% of their application and so on.

Chart 1. Model output for Commission's Proposal parameter settings



Comparing total available free allocation to industrial participants per year to the sum of their benchmarked applications for the Commission Proposal settings (assuming -1% benchmark reductions per annum for all sectors and zero activity growth) and showing the annual and cumulative headroom across the phase; a CSCF is triggered in the 2nd half and rapidly becomes more severe

3 Maximum number of allowances available for free allocation

The most obvious issue to address in this EU ETS Reform is the overall size of the cap on emissions, given the current 1.827MtCO₂e surplus supply built up since 2008 and given that the current EU ETS Directive:

“provides for the reductions of greenhouse gas emissions to be increased so as to contribute to the levels of reductions that are considered scientifically necessary to avoid dangerous climate change”¹⁵.

However, reducing the size of the EU ETS allowance cap to a level that goes beyond the EU’s 2030 climate and energy framework trajectory for a 43% reduction in ETS emissions by 2030 (compared to 2005) is not addressed in the Commission’s Proposal.

Sandbag considers that the size of the Phase 4 cap currently proposed by the Commission is a major shortcoming of the Phase 4 Reform Proposal.

As explored in our June 2016 report [‘Getting in touch with reality: Rebasing the EU ETS Phase 4 cap’](#), we advocate reducing the cap to ensure that the ETS is on track to deliver on the long term EU-wide targets of 80-95% emissions reductions.

3.1 Linear Reduction Factor (LRF%)

The Commission proposes to increase the annual cap reduction (the LRF) from 1.74% for Phase 3 to 2.2% for Phase 4 in order to reach the 2030 Climate and Energy Framework emissions reduction target.

The LRF% is applied to the re-scoped 2010 cap and translates to a reduction of just under 38.3MtCO₂e per year at 1.74% and just under 48.4MtCO₂e per year at 2.2%. Under a 2.2% LRF, continuing on from the current 2020 cap, the total Phase 4 cap would be just under 15,504MtCO₂e.

Many ENVI MEPs advocate a higher LRF than 2.2%¹⁶, some as high as 4% or higher¹⁷, and many advocate revisiting the LRF within the current and subsequent phases as a result of the United Nations Framework Convention on Climate Change (UNFCCC) global stocktakes under the 2015 Paris Agreement ratchet mechanism¹⁸.

Starting from the Commission’s Proposal, which results in a Phase 4 cap of 15,504MtCO₂e and a maximum number of free allocations of 6,267 MtCO₂e, Chart 2 below illustrates the impact of changing just the LRF%. The primary y-axis shows the how much the cap and the maximum free allocation would be reduced from the Commission’s Proposal values. The secondary y-axis shows the effect on the annual cap reduction. For example, changing the LRF from 2.2% to 3.2% decreases the total cap for Phase 4 by 1,210MtCO₂e. It decreases the maximum free allocations

¹⁵ [Consolidated version of Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, Article 1](#)

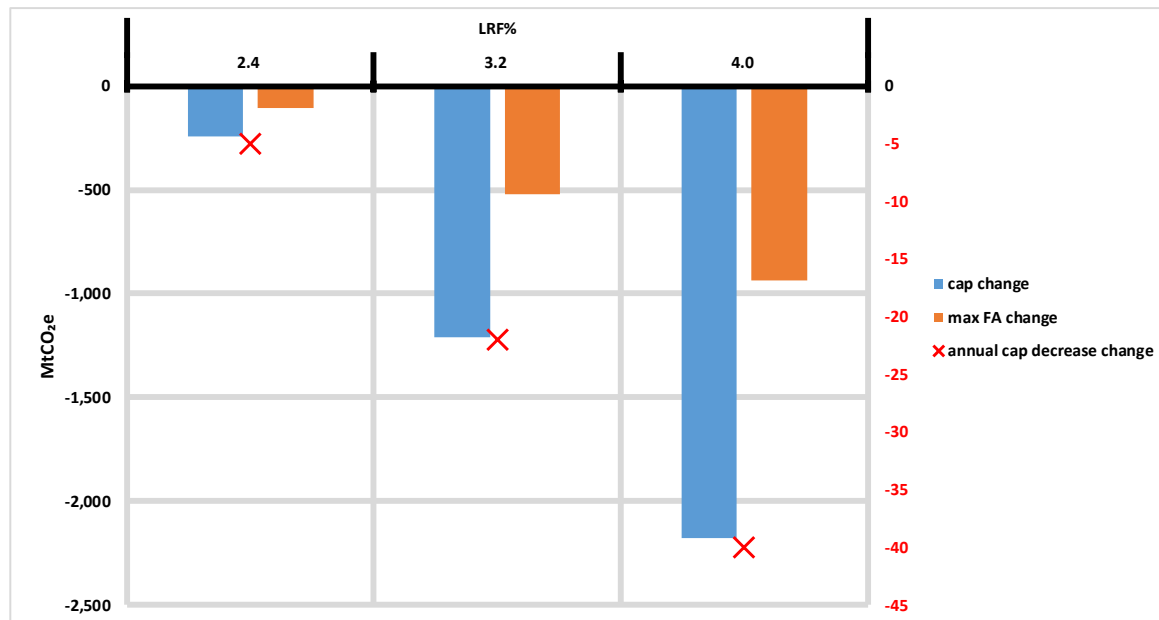
¹⁶ Amendments 217, 216, 215, 214, 213

¹⁷ Amendments 212, 211

¹⁸ Amendments 212, 213, 712, 713, 714, 715

available by 521MtCO₂e and it increases that the amount by which the cap goes down from one year to the next by 22MtCO₂e.

Chart 2. Impact of changing the LRF% on the overall cap and on the number of allowances available for distribution to industry



Change from Commission Proposal in total cap and in maximum free allocations available as a result of changing the LRF%; all other parameters are kept as in the Commission Proposal; the secondary y-axis shows how much more annual cap decrease results from increasing the LRF%

3.2 Start value to which apply LRF for Phase 4

The LRF% sets the pace of the cap reduction year over year throughout the Phase. However, as illustrated in [‘Getting in touch with reality: Rebasing the EU ETS Phase 4 cap’](#), the economic recession, together with other non-ETS policy drivers, has already achieved nearly all of the abatement required under the Phase 3 cap. Emissions in 2015 were already below the 2020 cap value¹⁹. **In order to avoid delaying further action, we need the Phase 4 cap to start from a more realistic starting point.**

The Commission’s reform proposal does not tackle this rebasing issue but several ENVI MEP amendments do call for rebasing.

Some suggest that the linear reduction amount should be applied to whichever is lower of the 2020 cap or the 2020 emissions level²⁰. Others ask for the LRF to be applied from a value

¹⁹ 2015 emissions 1,803MtCO₂e; 2020 cap 1,816MtCO₂e

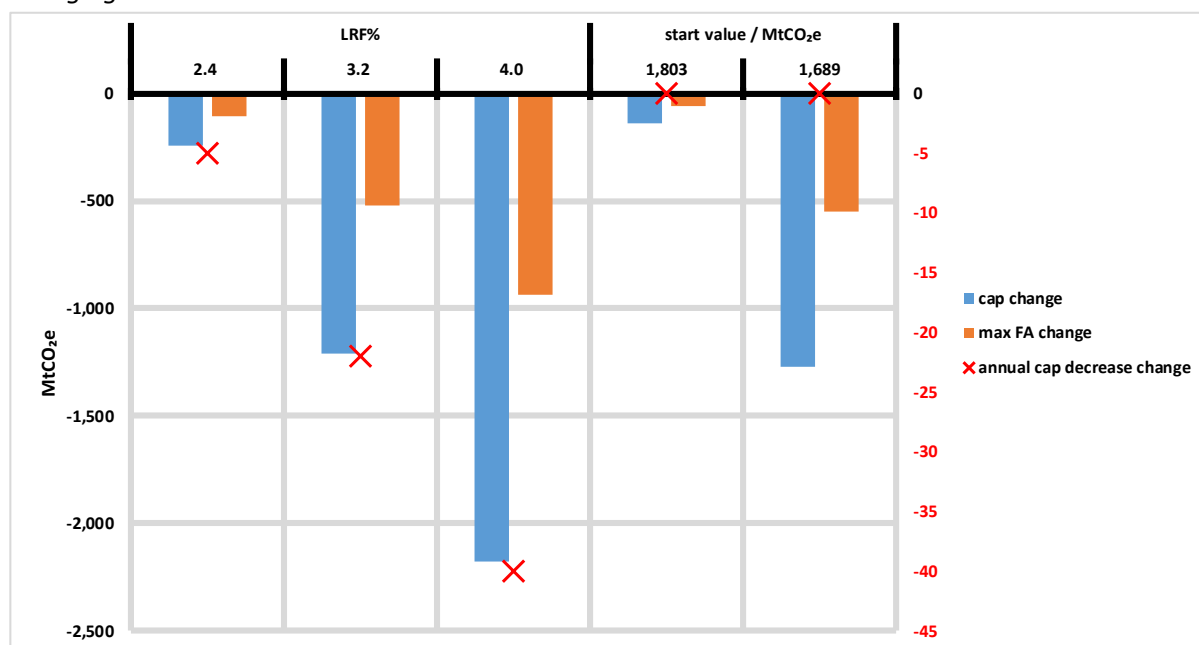
²⁰ Amendments 211, 214

equivalent to the average 2018 to 2020 emissions²¹. Others propose rebasing from a value equivalent to the average 2016 to 2018 emissions²².

Many of the amendments for lowering the start value involve future emissions levels which, of course, are not yet known. We have chosen to apply two options in this report: the actual 2015 stationary installations total of 1,803MtCO₂e, and our average 2017 to 2019 emissions estimate of 1,689MtCO₂e.

Chart 3 below adds to Chart 2 above. It compares the impact of changing just the start value to which the LRF reduction is applied to the impact of changing just the LRF itself - keeping all other parameters the same as in the Commission’s Proposal. It illustrates that restarting from 1,689MtCO₂e, rather than from the 2020 cap value, has a similar surplus reduction effect as increasing the LRF to 3.2% but without increasing the pace at which emissions reductions are required from business as usual levels. The restart merely removes part of the “hot air” which has been building up under the Phase 2 and Phase 3 caps.

Chart 3. Comparing impact of changing the start value to which the LRF% is applied to the impact of changing the LRF%



Change from Commission Proposal in total cap and in maximum free allocations available as a result of increasing the LRF%; all other parameters are kept as in the Commission Proposal; the secondary y-axis shows how much more the annual cap decreases as a result of increasing the LRF% - compared to - change as a result of decreasing the start value to which the LRF is applied

²¹ Amendments 215, 218, 219

²² Amendments 212, 213, 216

3.3 Auction share of total cap

The total EU ETS cap is split between allowances for auction and allowances for free allocation. Article 10 of the current EU ETS Directive states that member states shall auction allowances that are not freely allocated but it does not specifically fix the auction share. The Commission proposes to change this for 2021 onwards. It proposes to fix the auction share at the same level as the overall expectation for Phase 3, i.e. at 57%. The Commission considers that postponing a full transition to auctioning is justified to avoid carbon leakage. However, as will be seen later in this report, views on carbon leakage protection vary considerably within the ENVI MEPs.

Some ENVI MEPs want to remove the reference to a 57% auction share post 2020 to avoid fixing the share available for free allocation²³. Some want to reduce the auction share to 52%²⁴ or even 44%²⁵. As a measure to avoid a CSCF for carbon leakage exposed sectors (and even for non-exposed sectors in some cases), some ENVI MEPs want to allow transfer of 2% (or even more) of the auction share to free allocation²⁶. However, other MEPs call for increasing the auction share from 57% to 100% by 2035 or earlier²⁷. Some call for a 59% share with the extra 2% to raise climate action finance for least developed countries²⁸. One suggests a 63% share²⁹ and others call for full auctioning from 2021 onwards³⁰.

Chart 4 below adds to Charts 3 and 2 above. It compares the impact of changing just the auction share to just changing the above two parameters - again keeping all other parameters the same as in the Commission's Proposal.

²³ Amendments 229, 230 & 239

²⁴ Amendments 240, 242 & 241

²⁵ Amendment 243

²⁶ Amendments 240, 31, 21, 237, 367

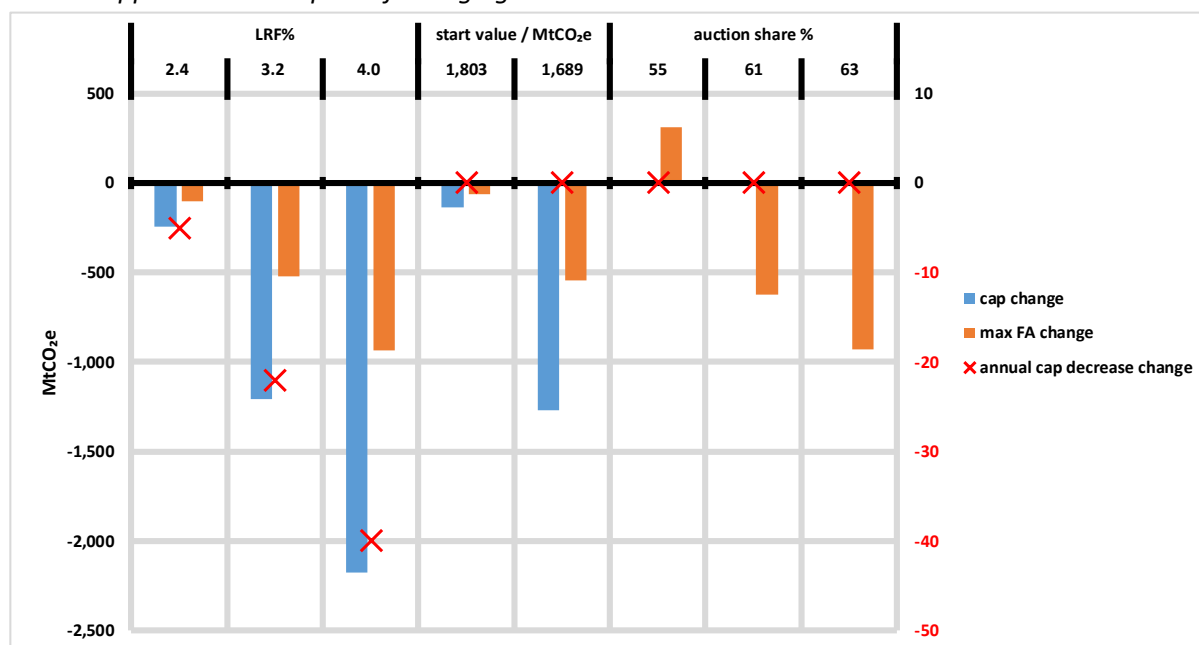
²⁷ Amendments 234, 235, 236, 508

²⁸ Amendments 255, 256

²⁹ Amendment 233

³⁰ Amendment 231

Chart 4. Comparing impact of changing auction share to impact of changing the start value to which the LRF% is applied and to impact of changing the LRF%



Change from Commission Proposal in total cap and in maximum free allocations available as a result of changing the LRF%; all other parameters are kept as in the Commission Proposal; the secondary y-axis shows how much more annual cap decrease results from increasing the LRF% - compared to - change as a result of decreasing the start value to which the LRF is applied - compared to - change as a result of adjusting the auction share

With no impact at all on the surplus, and with no impact on the rate at which emissions reductions are needed to remain below the cap, a move to about 61% auction share would have a similar impact on the maximum free allocations available for industry as Sandbag’s rebasing recommendation. A move to 63% auction share would have about the same impact on the free allocations as a move to a 4% LRF. A 2% reduction in the auction share would augment the free allocation share by just over 300 million allowances. However, **Sandbag’s modelling shows that it will not be necessary to reduce the auction share if the distribution of the maximum available free allocation is targeted only to the sectors most at risk** (see Section 4 on allowance distribution).

3.4 Number and source of allowances set aside for Innovation Support

The Commission proposes to take 400 million allowances from the free allocation share, together with a further 50 million Phase 3 allowances taken from the MSR, in order to auction them to raise funds for innovation support.

ENVI MEP amendments vary significantly on the preferred number and source of these allowances. Some propose 800 million³¹ allowances for innovation support, others 600 million³², others 550 million³³. Several MEP amendments propose to take these innovation support allowances from the auction share instead of the free allocation share³⁴. The ENVI Rapporteur, Ian Duncan, proposes that half should be taken from the auction share and half from the free allocation share³⁵. He also proposes that 150 million leftover unallocated Phase 3 allowances should be diverted from the MSR and added to the Phase 4 innovation support³⁶.

Sandbag welcomes proposals for more innovation support but strongly recommends that any such allowances should only come from the Phase 4 cap.

3.5 Source of New Entrants Reserve (NER) allowances

Rather than apportion part of the Phase 4 cap to a NER for Phase 4, the Commission proposes to create an NER pot of 400 million allowances by diverting 150 million leftover unallocated Phase 3 allowances and adding a further 250 million Phase 3 allowances taken from the MSR. Allowances freed up as a result of partial cessations or closures during Phase 4 will also be added to the NER pot.

In effect, this proposal increases the size of the Phase 4 cap by 400 million.

Several ENVI MEPs propose that allowances should not be carried over from Phase 3 in this way³⁷, with some suggesting that the NER allowances should come out of the Phase 4 cap instead³⁸. ENVI MEPs also propose amendments to make it possible to cancel unallocated free allocations³⁹ rather than auctioning them or placing them in the MSR or using them for next Phase NER.

Sandbag finds that, with careful selection of distribution parameters, ***there is enough room to avoid adding any Phase 3 allowances to the Phase 4 supply*** - even under a tightened cap.

Sandbag strongly recommends the Phase 4 cap should not be augmented with any Phase 3 allowances. The 150 million unallocated Phase 3 allowances should be retired from the EU ETS as a small measure towards reducing the current huge surplus. If not cancelled, then they should be placed in the MSR.

³¹ Amendment 411

³² Amendments 409, 410,

³³ Amendment 415

³⁴ Amendments 241, 417, 420, 422

³⁵ Amendment 22

³⁶ Amendment 36

³⁷ Amendment 400

³⁸ Amendments 390, 391, 392, 393, 394,

³⁹ Amendments 228, 232, 369

4 Distribution of maximum available free allocation across industry sectors

Section 3 has looked at the parameters which influence the maximum number of allowances available for free allocation. We now look at the parameters influencing the distribution of these free allocations across industry sectors.

4.1 Carbon leakage assessment

A number of ENVI MEP amendments raise concerns about the current approach used to assess carbon leakage exposure. The current carbon leakage list was adopted in October 2014 and indicates which sectors and sub-sectors, primarily at the NACE code level, meet the current carbon leakage criteria.

In particular, some ENVI MEPs propose that sectors whose trade intensity increases through rising exports should not be considered subject to higher risk of carbon leakage⁴⁰. Other MEPs suggest there should be *no* continuing free allocation to industry⁴¹ whilst others propose that even district heating should be considered as at risk of carbon leakage⁴².

One MEP suggests that the cement sector should not receive any free allocation but should instead be protected from any unfair competition through a requirement for importers to surrender EU ETS allowances⁴³. The cement sector is currently a significant recipient of free allocation, primarily as a result of the high emissions intensity of clinker, the sector's main benchmarked product. Sandbag's March 2016 report, [Cement - The Final Carbon Fatcat: How Europe's cement sector benefits and the climate suffers from emissions trading flaws](#), helped shed light on carbon leakage assessment shortcomings for the cement industry.

The current and proposed assessment approaches include both direct and indirect emissions in the measure of carbon leakage. Member states may also adopt national state aid schemes to compensate electro-intensive sectors for indirect carbon costs passed through in the form of higher electricity prices.

Many MEPs propose to harmonise the approach used for this indirect cost compensation⁴⁴. Some propose to use up proportions of the auction share, in one case up to 19% of the auction share⁴⁵, to establish a harmonised compensation scheme. Some even propose full compensation for indirect costs⁴⁶.

⁴⁰ Amendment 126

⁴¹ Amendment 449

⁴² Amendment 458

⁴³ Amendment 514

⁴⁴ Amendments 379, 380, 381, 382, 383, 384, 385

⁴⁵ Amendment 251

⁴⁶ Amendments 386, 389

Article 10a Paragraph 1 sub-paragraph 6 of the current EU ETS Directive allows for review of the free allocation rules in light of international agreement on climate change leading to comparable mandatory greenhouse gas emissions reductions. This sub-paragraph remains unchanged in the Commission's Proposal but Article 10b, which refers specifically to such agreements with regard to appropriate measures for carbon leakage protection, is replaced in the proposal and the reference to international agreements is removed. A number of ENVI MEPs propose amendments to the new version of Article 10b to reintroduce this reference⁴⁷. Some MEPs propose a new Article 30a to explicitly link carbon leakage assessment to the UNFCCC Paris Agreement global stocktakes⁴⁸.

⁴⁷ Amendments 497, 498, 514

⁴⁸ Amendments 712, 713

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)

In March 2014, the Commission shared figures used when establishing the current carbon leakage list for 2015 to 2019 per NACE code for total carbon costs per gross value added and for trade intensity. These values can be used to calculate the new proposed measure of carbon leakage exposure by applying a carbon price of €30 to the total carbon costs per gross value for each NACE code to calculate its equivalent emissions intensity. This emissions intensity figure can then be multiplied by each NACE code's trade intensity figure.

For some NACE codes, information in the Impact Assessment (IA) accompanying the Commission's Reform Proposal suggests that either the total carbon costs per gross value added or the trade intensity values have been updated since March 2014. For the NACE codes which fall into a different IA targeted carbon leakage threshold as a result of such changes, this model applies the new carbon leakage assessment value as seen in the IA.

Review of the carbon leakage assessment criteria is outside the scope of this report. Nevertheless, Sandbag strongly supports measures to keep carbon leakage protection under close scrutiny. ***We strongly recommend that the current reforms should allow for timely review and adjustment of carbon leakage protection in order to free up allowances for auctioning.***

Given the importance of the classification of installations and sub-installations into NACE codes for determining their carbon leakage exposure, ***Sandbag strongly recommends that up to date mappings of installations to NACE codes should be shared on an annual basis together with the compliance data.***

4.2 Carbon leakage thresholds

4.2.1 Comparing different binary and targeted carbon leakage protection options

The Commission proposes to continue the current binary approach for assessing carbon leakage exposure. If certain carbon intensity and trade intensity criteria are met, a sector or sub-sector is considered to be either fully exposed or fully not exposed. Installations and/or sub-installations will receive either 100% of their activity level benchmarked free allocation or 30%, depending on whether their products are assessed to be carbon leakage exposed or not.

Some ENVI MEPs consider the Commission's Proposal of a 0.2 binary threshold to be too high and propose values of 0.18⁴⁹ or even 0.15⁵⁰, with qualitative assessment for values above 0.12⁵¹. Some propose that allowances from the NER pot or MSR should be used in order to continue 100% benchmarked allocation to carbon leakage exposed sectors, particularly those assessed as very highly exposed, in the event of the maximum ceiling on free allocation being reached⁵².

Others favour a more targeted carbon leakage protection approach, as explored in the Impact Assessment (IA) accompanying the Commission's Reform Proposal^{53 54}. The IA targeted approach involves four tiers of carbon leakage exposure (very high, high, medium and low) with each level receiving a different percentage of their benchmarked free allocation⁵⁵.

The ENVI Rapporteur, Ian Duncan, also proposes four tiers but at different levels and with different percentages of benchmarked allocation for each tier⁵⁶.

The EPP ENVI coordinator, Peter Liese, proposes a linear gradation of benchmark allocation from 100% at a threshold of 1.6 down to 0%⁵⁷.

Other MEPs propose that sectors with carbon leakage assessment levels below the current 0.2 threshold should receive no free allocation⁵⁸.

Chart 5 below illustrates the impact of different carbon leakage protection options (binary or targeted, with different tier values) on the benchmarked free allocation application by NACE code, with all other parameters the same as in the Commission's Proposal and with 1% growth. The cumulative headroom to the maximum number of allowances available is also shown.

There is a significant step down in the total free allocation application for all five targeted approaches compared to the two binary approaches. Total applications for the top six recipient

⁴⁹ Amendment 455

⁵⁰ Amendment 456

⁵¹ Amendments 476, 472, 473

⁵² Amendments 304, 305, 373, 397, 374, 375, 396

⁵³ Amendments 451, 452, 453

⁵⁴ See Section 7 http://ec.europa.eu/clima/policies/ets/revision/docs/impact_assessment_en.pdf

⁵⁵ (100% 2.5, 80% 1.0, 60% 0.2, 30% rest)

⁵⁶ Amendment 40 (100% 1.6, 75% 0.9, 50% 0.15, 30% rest)

⁵⁷ Amendment 454

⁵⁸ Amendments 451, 452, 453

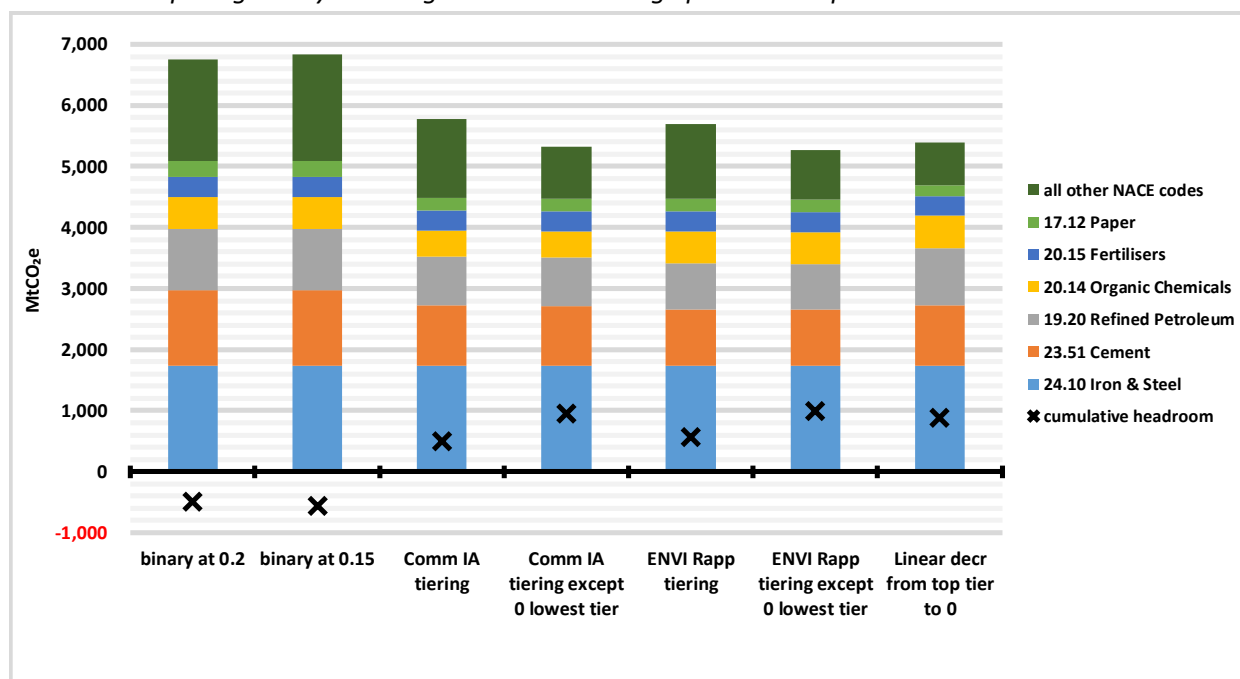
NACE sectors remain more or less the same across the four tiered options and increase slightly under the linearly decreasing option. All five targeted options avoid a CSCF.

Comm IA tiering refers to the tiering explored in the Commission’s Impact Assessment accompanying their reform proposals⁵⁹.

ENVI Rapp tiering refers to Amendment 40⁶⁰ from ENVI Rapporteur Ian Duncan.

Linear decr from top tier to 0 refers to Amendment 454⁶¹ from EPP ENVI Group Coordinator Peter Liese.

Chart 5. Comparing binary and targeted carbon leakage protection options



Comparing whole phase total free allocation applications, stacked by NACE sector, for two different binary options and five different targeted options; all other parameters are kept the same at 57% auction share, 2.2% LRF from 2020 cap, -1% benchmark reduction, 400M innovation support from free allocation share, NER from Ph3 and 1% growth; the cumulative headroom at the end of the phase is also shown; all five targeted options avoid a CSCF

Chart 6 below illustrates how the two NACE sectors with highest benchmarked application, 24.10 Iron and Steel and 23.51 Cement, are the most effected by a CSCF under the Commission’s Proposal for determining the maximum number of allowances available for free allocation (i.e. total cap 15,505MtCO₂e) and with 1% annual activity growth. The binary approaches with a CSCF leave the iron and steel sector with fewer free allocations than the targeted approaches which

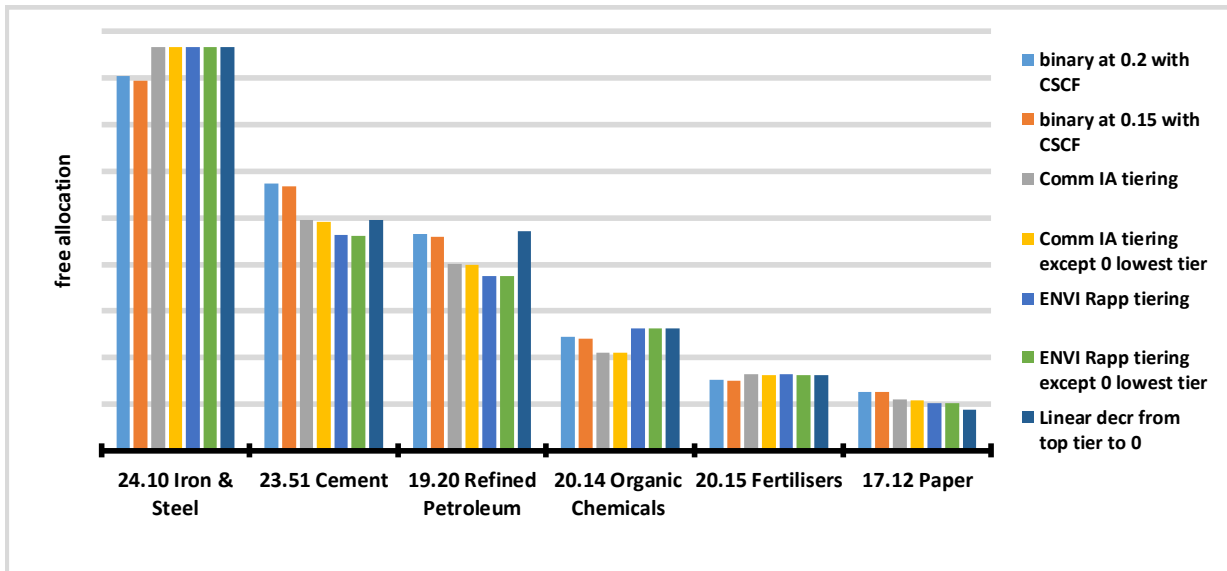
⁵⁹ (100% 2.5, 80% 1.0, 60% 0.2, 30% rest)

⁶⁰ (100% 1.6, 75% 0.9, 50% 0.15, 30% rest)

⁶¹ (100% 1.6 scaled down linearly to 0% for 0)

all avoid a CSCF. The cement sector gets more free allocation for the binary approaches even after the CSCF. The refined petroleum sector is better off under a linearly decreasing approach.

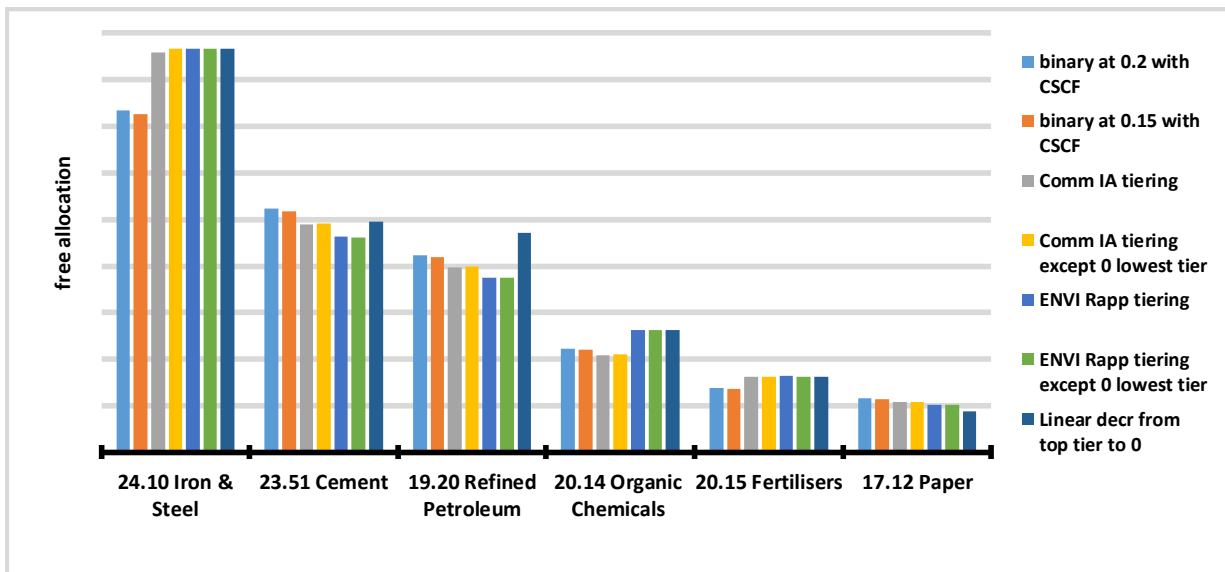
Chart 6. Comparing binary and targeted carbon leakage protection options - after applying any CSCF



Comparing whole phase total free allocations **after applying any required CSCF** for seven carbon leakage protection approaches; with 57% auction share, 2.2% LRF from 2020 cap, -1% benchmark reduction, 400M innovation support from free allocation share, NER from Ph3 and 1% growth; the binary threshold options both require a CSCF; the targeted options all avoid a CSCF; 24.10 Iron & Steel is clearly better protected with targeted approaches which avoid a CSCF; 23.51 Cement is better off with the binary approaches even after the CSCF; 19.20 Refined Petroleum is better protected under a linear approach from a 1.6 top threshold

Chart 7 below compares the same carbon leakage protection approaches under a cap which reduces the surplus by -1,271MtCO₂e.

Chart 7. Comparing binary and targeted carbon leakage protection options - after applying any CSCF - reduced cap

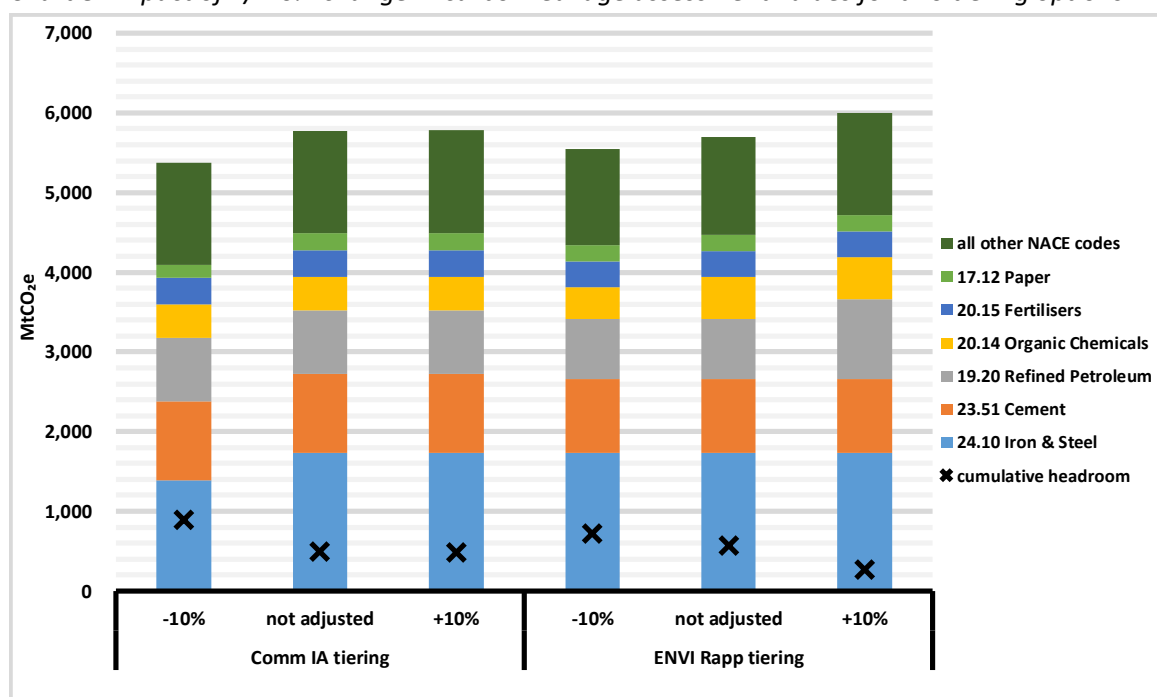


Comparing whole phase total free allocations **after applying any required CSCF** for seven carbon leakage protection approaches; with 57% auction share, 2.2%LRF from 1,689MtCO₂e, -1% benchmark reduction, 0 innovation support from free allocation share, NER from Ph4 and 1% growth; the binary threshold options and the Comm IA tiering all require a CSCF; the other targeted options all avoid a CSCF; 24.10 Iron & Steel is clearly better protected with targeted approaches which avoid a CSCF; 23.51 Cement is still better off with a binary approach even after the CSCF although the difference is smaller; 19.20 Refined Petroleum is much better protected under a linear approach from a 1.6 top threshold

The impact of a +/-10% change in the carbon leakage assessment values (i.e. the products of emissions intensities and trade intensities) on two of the above tiering options is illustrated in Chart 8 below. All other parameters are kept the same as in the Commission’s Proposal. Activity growth is set at 1%.

The sectors receiving most free allocations appear to be sitting well within their threshold boundaries under both of these tiering options. NACE sector 24.10 would drop down from a 2.5 top threshold with a -10% carbon leakage assessment change whereas 19.20 would jump up to a 1.6 top threshold with a +10% change.

Chart 8. Impact of +/-10% change in carbon leakage assessment values for two tiering options



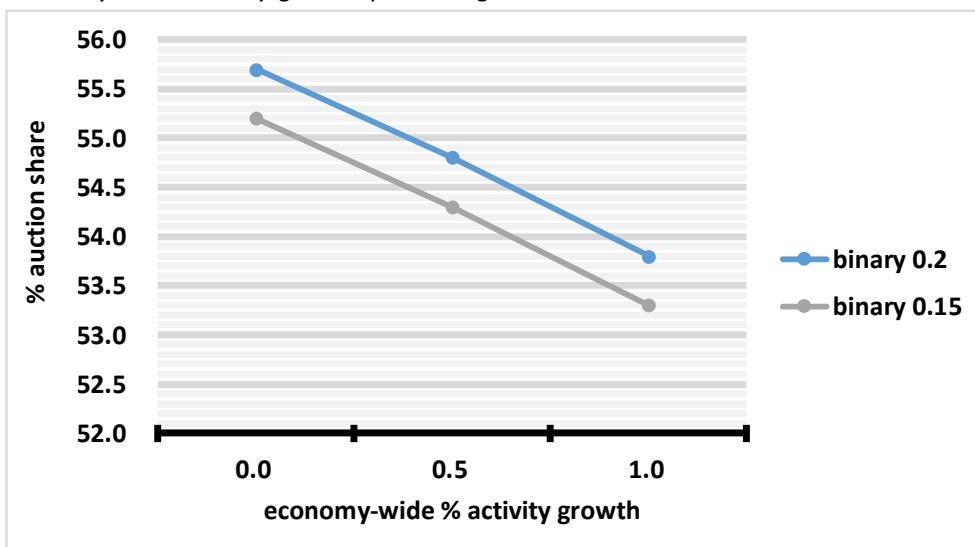
Comparing whole phase total free allocation applications for not adjusted and for +/-10% adjusted carbon leakage assessment values, stacked by NACE sector, under two different tiering options; all other parameters are kept the same i.e. 57% auction share, 2.2% LRF from 2020 cap, -1% benchmark reduction, 400M innovation support from free allocation share, NER from Ph3 and 1% growth; the cumulative headroom at the end of the phase is also shown; even a 10% increase in the carbon leakage assessments of all NACE sectors avoids a CSCF under both tiering options

4.2.2 Auction share reductions required to avoid a CSCF with binary options

The targeted option examples in the sub-section above illustrate that **it is not necessary to reduce the auction share** if distribution of the free allocation share of the cap is targeted in line with the extent of industry sectors' carbon leakage exposure. With a targeted approach under the current carbon leakage assessment rules, benchmarked free allocation applications remain within the maximum available under the Commission's Proposal of 57% auction share and there is room for activity growth - even when the surplus is addressed by starting the Phase 4 cap from a more realistic starting point.

However, as noted in Section 3.3, a number of ENVI MEPs propose amendments to reduce the auction share in order to avoid a CSCF. Sandbag has modelled how much reduction in the auction share is needed to avoid a CSCF when continuing the binary approach to carbon leakage protection for the current carbon leakage assessment criteria with different economy-wide growth percentages. Chart 9 below illustrates this for two binary approaches. All other parameters are kept the same as in the Commission's Proposal (i.e. 2.2% LRF from 2020 cap, -1% benchmark reduction, 400M innovation support from free allocation share, NER from Ph3).

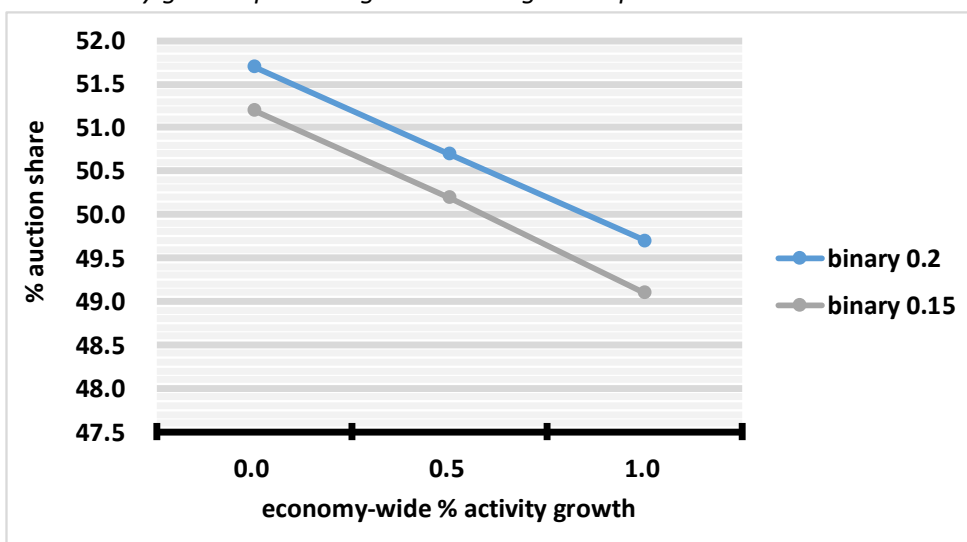
Chart 9. Auction share needed to avoid CSCF with binary carbon leakage approach for different economy-wide activity growth percentages



Auction shares needed to avoid CSCF at different economy-wide % activity growth for two binary carbon leakage protection options; all other parameters are kept the same i.e. 2.2%LRF from 2020cap, -1% benchmark reduction, 400M innovation support from free allocation share, NER from Ph3

Chart 10 below illustrates the reduction in auction share required to avoid a CSCF for these two binary approaches if the surplus is addressed by starting the Phase 4 cap from a more realistic starting point and with all Phase 4 NER taken from the Phase 4 cap and the 400M innovation support allowances taken from the auction share.

Chart 10. Auction share needed to avoid CSCF for binary carbon leakage approach for different economy-wide activity growth percentages under a tighter cap

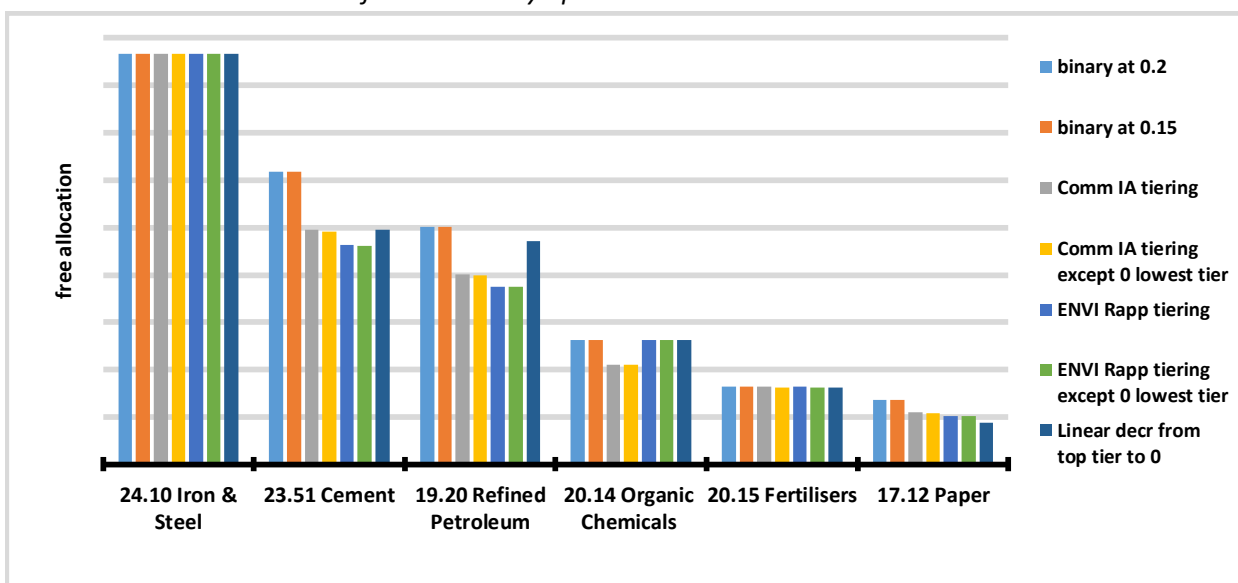


Auction shares needed to avoid CSCF at different economy-wide % activity growth for two binary carbon leakage protection options; the cap is reduced from 15,504 to 14,232 MtCO₂e; 0 innovation support from free allocation share, NER from Ph4

The above two charts illustrate the unsuitability of the binary approach for addressing the key problem with the current EU ETS, its surplus. With a binary approach to carbon leakage protection, the auction share would need to be reduced considerably under any growth scenario - even without addressing the surplus – in order to avoid taking away benchmarked free allocations from best performing highly exposed installations via a CSCF. This directly contradicts the intention of the system to release allowances to the market via auctioning.

Chart 11 below is the same as Chart 6 in Section 4.2.1 except that the auction share is reduced to avoid a CSCF for the two binary approaches. (The targeted approaches all already avoid a CSCF without reducing the auction share.) These two charts, both for 1% economy-wide growth, show the free allocations by NACE code under different carbon leakage protection approaches. They illustrate why the cement sector, for example, is likely to prefer a binary approach over a targeted approach regardless of the auction share and is certainly likely to prefer a binary approach with a decreased auction share to avoid a CSCF. The choice is less clear cut for other sectors, depending on which targeted approach is chosen.

Chart 11. Comparing binary and targeted carbon leakage protection options - after decreasing the auction share to avoid a CSCF for both binary options



Comparing whole phase total free allocations **after decreasing the auction share to avoid a CSCF** for 1% economy-wide growth; 23.51 Cement and 17.12 Paper are clearly better off with the binary approaches and a reduced auction share; the difference is less clear cut for 19.20 Refined Petroleum under a linear approach from a 1.6 top threshold; 24.10 Iron and Steel, 20.14 Organic Chemicals and 20.15 Fertilisers are just as well protected with well-chosen targeted approaches and no decrease in the auction share

4.3 Benchmarks

EU wide ex-ante benchmarks, calculated for products rather than for inputs, are supposed to ensure that free allocation provides incentives for GHG reductions and energy efficient techniques⁶². Yet, the current benchmarks, established from 2007 to 2008 data, are now somewhat out of date.

To reflect technological progress for decarbonisation, rather than going through a new extensive data collection and benchmark recalculation exercise, the Commission proposes to squeeze the current benchmarks by -1% for each year between 2008 and the relevant period of free allocation. This means a -15% reduction for the first half of Phase 4 (15 years from 2008 to 2023) and a -20% reduction for the second half (20 years from 2008 to 2028).

Under parameter settings which avoid a CSCF, the only on-going reduction in free installations post 2020 comes from the rate at which the product benchmarks are reduced from the current values. ***This is a significant and, in Sandbag's view, undesirable deviation from the current steady transition away from free allocation.***

To identify sectors and sub-sectors with less or more decarbonisation potential, the Commission proposes to collect data every five years for the five prior years under a new sub-paragraph to Article 11 Para 1 of the current directive. The data to be collected includes production activity, transfers of heat and gases, electricity production and emissions at the sub-installation level. The benchmarks for such sectors and sub-sectors will be adjusted by -0.5% or -1.5% respectively instead of by -1%.

Given the importance of understanding the impact of allowance transfers related to transfers of heat and gases on allowance balances by NACE sector, ***Sandbag strongly advocates that transfers of heat and gases should be shared together with the compliance data in the EU Transaction Log.*** This is essential for appropriate stakeholder scrutiny on policy effectiveness.

Many ENVI MEP amendments call for recalculation of the benchmarks instead of applying steady percentage declines from current benchmark values. Opinions differ on which data should be used. Some call for the use of 2014 to 2015 data⁶³, some for the use of 2013 to 2017 data⁶⁴, others for 2016 to 2017 data⁶⁵, and others for 2017 to 2018 data⁶⁶. Other MEPs call for smaller or zero reductions in benchmarks for process emissions considered to be unavoidable⁶⁷. Some even suggest no reduction in benchmarks for some or all process emissions⁶⁸ which begs the

⁶²Article 10a Para 1 sub-para 3 current ETS Directive

⁶³ Amendment 316

⁶⁴ Amendments 312, 317, 320, 321

⁶⁵ Amendment 324

⁶⁶ Amendments 313, 326, 327, 338

⁶⁷ Amendments 337, 339, 340, 349, 356, 357

⁶⁸ Amendments 323, 344

question of how exactly do they propose to use market forces to promote investment in decarbonising EU industry?

Sandbag does not have access to recalculated benchmarks. Instead, our model applies steady percentage declines from the current benchmark values. However, rather than applying a fixed value of -1.0%, with -0.5% or -1.5% as exceptions, the model allows the user to set any value either for all NACE codes or on a NACE code by NACE code basis.

4.4 Activity levels

Old, out of date production data from between 2005 and 2010 is currently applied to calculate benchmarked free allocation for Phase 3 (2013 to 2020), except for cases of partial cessation, closure, new entrance and significant capacity change which are (re)calculated from current data.

The Commission proposes to re-establish activity levels for Phase 4 once every five years using data collected under a new sub-paragraph to Article 11 Paragraph 1 of the current EU ETS Directive. Activity levels for the 2013 to 2017 period will be used to calculate benchmarked free allocation for the first half of the Phase 4 and activity levels for the 2018 to 2022 period will be used to calculate benchmarked free allocation for second half of Phase 4.

However, a number of ENVI MEPs call for a more dynamic approach to activity level assessment. Several call for activity levels to be recalculated every two years⁶⁹ with activity level change thresholds for benchmarked free allocation recalculation varying between +/-10% to +/-15%. Some call for activity levels to be adjusted every year for production level changes of more than +/- 5%⁷⁰.

Sandbag strongly supports moves to more frequent re-establishment of the activity levels used to calculate benchmarks free allocation.

4.5 Relationship between benchmark reduction and activity growth when avoiding a CSCF under various carbon leakage protection approaches

The Commission's Proposal continues the current provision of applying a uniform CSCF across all installations if the sum of the benchmarked allocation applications exceeds the maximum number of allowances available for free allocation.

The interdependence of benchmark reductions and activity level growth when avoiding a CSCF is illustrated in the charts below. The lines show the X and Y values needed to achieve a cumulative headroom value of between 4 million and 10 million spare free allocations by the end of Phase 4.

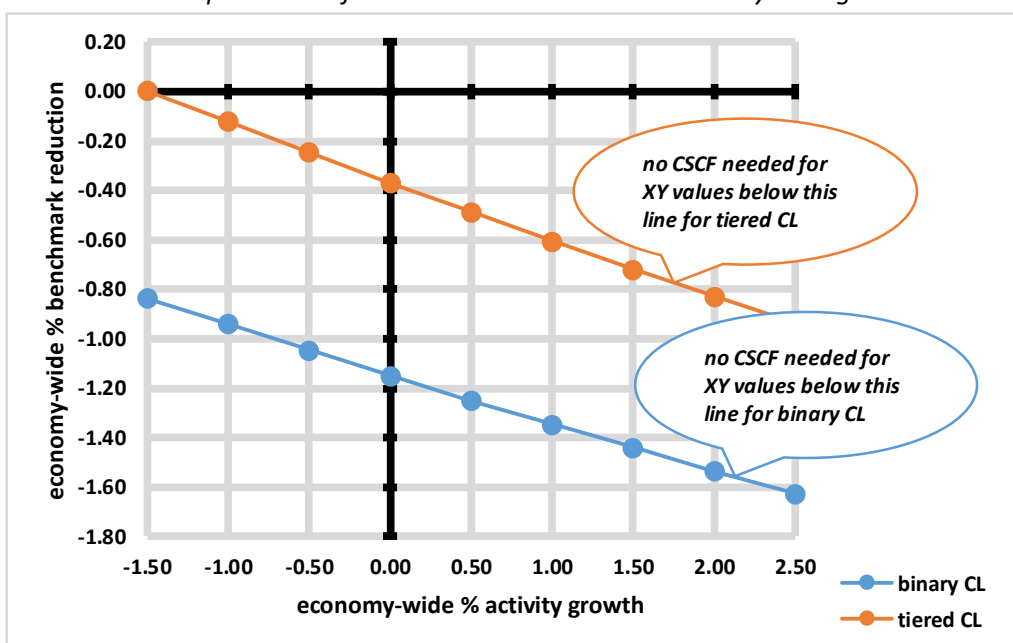
⁶⁹ Amendments 301, 302, 311, 395, 448, 659, 660, 661, 662, 663

⁷⁰ Amendments 303, 401

Chart 12 compares the XY plot needed to avoid a CSCF for the Commission’s binary carbon leakage protection approach⁷¹ to the XY plot needed for the Commission’s IA tiering⁷² approach, with all other parameters kept the same as in the Commission’s Proposal⁷³.

The binary approach would require greater than -1% benchmark reductions even for zero economy wide growth. The tiering approach supports significant activity growth without needing huge reductions in the current benchmarks to avoid a CSCF. With tiering, even 2% growth requires a less than -1% benchmark reduction across all sectors.

Chart 12. Interdependence of benchmark reductions and activity level growth



Comparing XY plots of economy-wide % activity growth and economy-wide % benchmark reduction to achieve between 4 million and 10 million cumulative headroom at phase end for two carbon leakage protection options; the blue line is for a binary carbon leakage threshold of 0.2, the orange line is for the tiered approach explored in the Comm IA; all other parameters are kept the same at 57% auction share, 2.2%LRF from 2020cap, -1% benchmark reduction, 400M innovation support from free allocation share, NER from Ph3

⁷¹ Threshold 0.2

⁷² (100% 2.5, 80% 1.0, 60% 0.2, 30% rest)

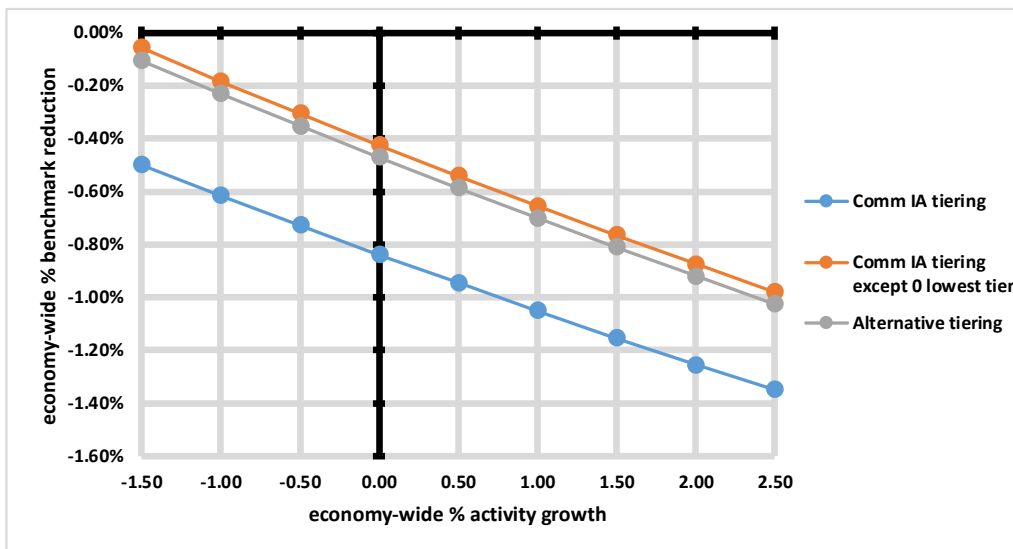
⁷³ (57% auction share, 2.2%LRF from 2020cap, -1% benchmark reduction, 400M innovation support from free allocation share, NER from Ph3)

Chart 13 below illustrates this interdependence of benchmark reductions and activity level growth under a tighter cap. In this chart, the lines show the XY plots needed for a cumulative headroom value of between 4 million and 10 million spare free allocations i.e. avoiding a CSCF, for a Phase 4 cap of 14,232MtCO₂e calculated from a lower start value (1,689 MtCO₂e).

Comm IA tiering again refers to the tiering explored in the Commission’s Impact Assessment accompanying their reform proposals⁷⁴.

Alternative tiering is similar to the *ENVI Rapp tiering*⁷⁵ but instead uses 100% 1.6, 75% 0.9, 50% 0.2, 10% rest.

Chart 13. Interdependence of benchmark reductions and activity level growth under a tighter cap



Comparing XY plots of economy-wide % activity growth and economy-wide % benchmark reduction to achieve between 4 million and 10 million cumulative headroom at phase end for three carbon leakage protection options; the blue line is for the tiered approach explored in the Comm IA, the orange line is for the tiered approach explored in the Comm IA except for no free allocation to non-carbon leakage exposed sectors; the grey line is for an alternative tiering approach which does allow for 10% allocation to non-carbon leakage exposed sectors; the cap is reduced from 15,504 to 14,232 MtCO₂e; 400M innovation support from free allocation share, NER from Ph3

Under this tightened cap with the Comm IA tiering, the benchmarks would need to be reduced by more than -1% per year to allow for 1% activity growth per year. If this tiering is modified such that non-carbon leakage exposed activities receive no free allocation then 1% growth can be met for a smaller benchmark reduction. The alternative tiering allows for similar activity growth and benchmark reductions even for some free allocation to non-carbon leakage exposed activities.

⁷⁴ (100% 2.5, 80% 1.0, 60% 0.2, 30% rest)

⁷⁵ (100% 1.6, 75% 0.9, 50% 0.15, 30% rest)

5 Examples of tiering options which address the surplus issue and allow for activity growth whilst still avoiding a CSCF

Sandbag has identified several tiering options which avoid a CSCF under a tightened cap even for significant economy wide activity growth.

For all of the charts below, the Phase 4 cap is tightened by 1,271MtCO₂e by applying an LRF of 2.2% from a starting point of 1,689MtCO₂e. In each case, the auction share is maintained at 57% and all of the Phase 4 NER is taken from the Phase 4 cap.

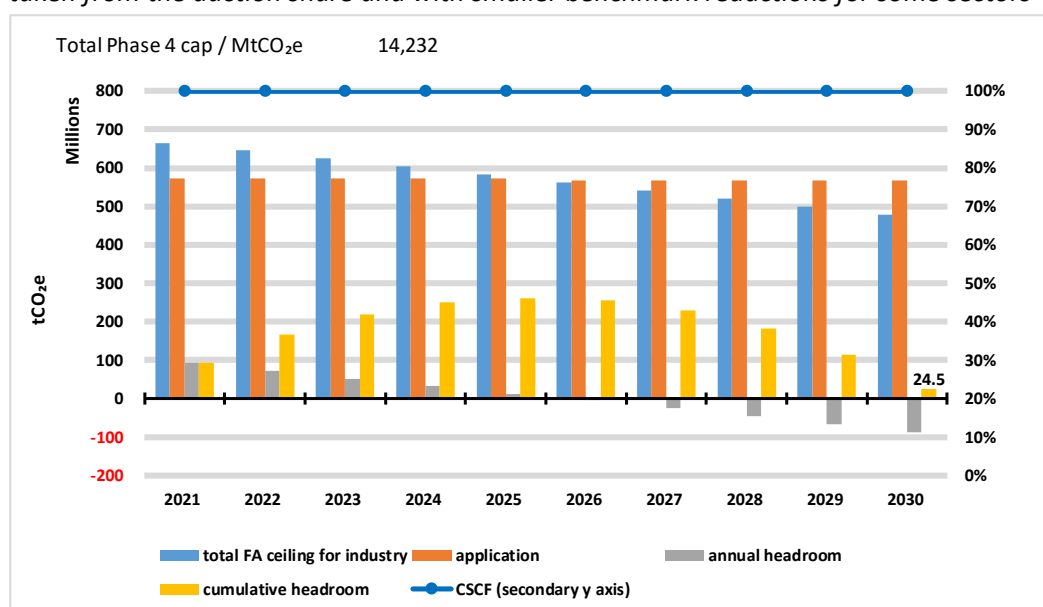
Each chart compares the total available free allocation to industrial participants per year to the sum of their benchmarked applications per year and shows the annual and cumulative headroom across the phase. The secondary y-axis shows the resulting CSCF.

A CSCF value of 100% means that no adjustment is needed to keep the benchmarked free allocation applications within the maximum number of allowances available.

5.1 Tiering option 1

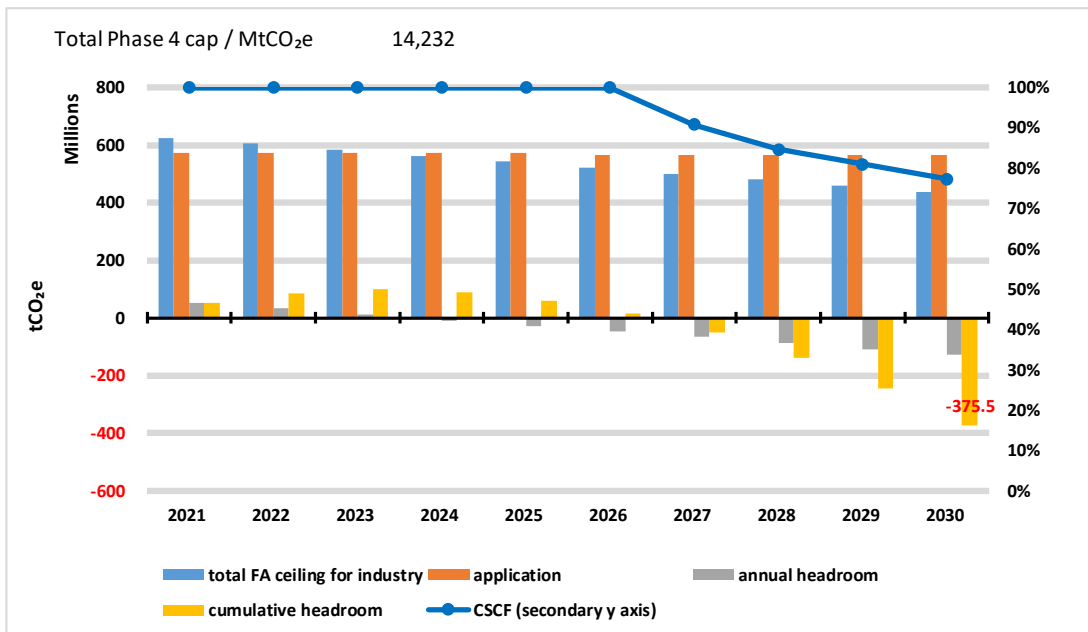
Innovation Support	Carbon Leakage protection	Benchmark reductions	Activity growth
400 million from auction share	tiered with 100% 1.6 75% 0.9 50% 0.2 10% rest	all sectors -1%, except -0.5% for 24.10 Iron and Steel 23.51 Cement 19.20 Refined Petroleum 20.14 Organic Chemicals 20.15 Fertilisers	all sectors 0.5%

Chart 14. Tiering option 1 with 0.5% growth, with surplus reduction, with innovation support allowances taken from the auction share and with smaller benchmark reductions for some sectors



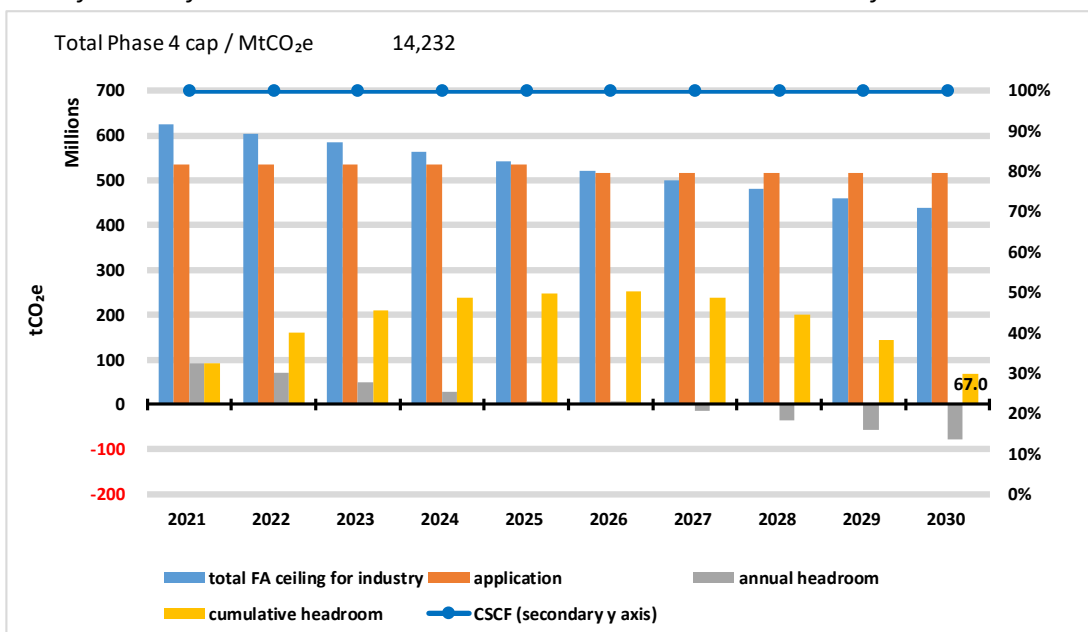
Taking the 400 million innovation support allowances from the free allocation share instead of the auction share would result in a CSCF in the second half of the phase, as illustrated below.

Chart 15. Tiering option 1 with 0.5% growth, with surplus reduction, with innovation support allowances taken from the free allocation share and with smaller benchmark reductions for some sectors



However, a CSCF can still be avoided, even if the 400 million innovation support allowances are taken from the free allocation share, if the benchmarks are reduced by -1% for *all* sectors. This is illustrated in the chart below.

Chart 16. Tiering option 1 with 0.5% growth, with surplus reduction, with innovation support allowances taken from the free allocation share and with -1% benchmark reductions for all sectors



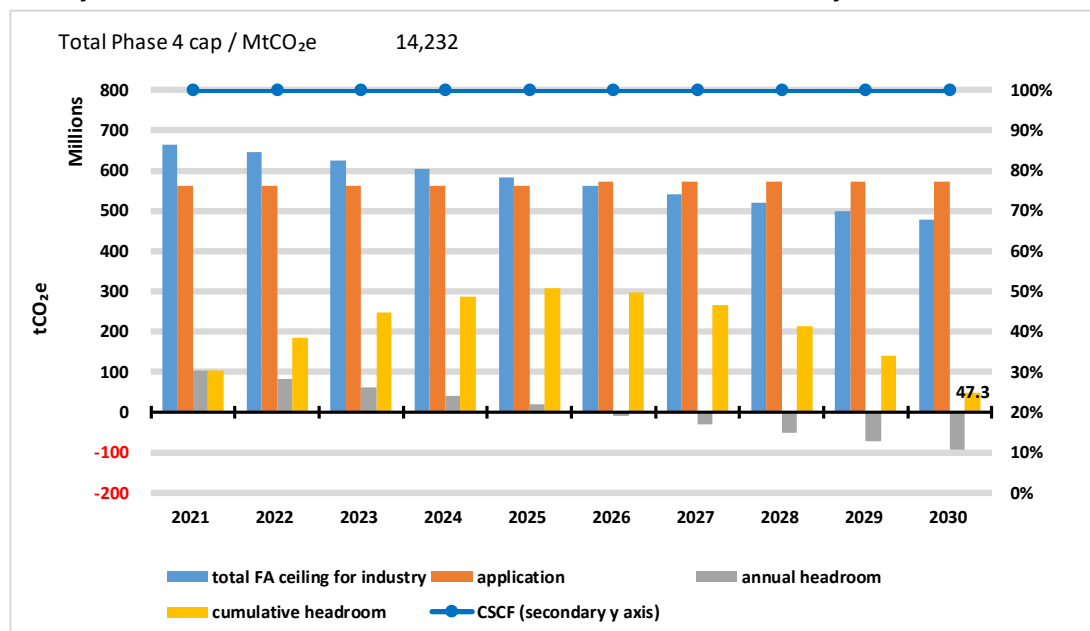
Sandbag does not consider that -1% benchmark reductions are unreasonable. After all, we are looking for an overall decline of more than -2% of the 2010 cap level with the current LRF proposal. The whole purpose of the EU ETS is to allow industrial sectors to trade least cost abatement amongst themselves in order to achieve steady economy-wide emissions reductions.

5.2 Tiering option 2

Innovation Support	Carbon Leakage protection	Benchmark reductions	Activity growth
400 million from auction share	tiered with 100% 1.6 75% 0.9 50% 0.2 zero rest	all sectors -1%, except -0.5% for 24.10 Iron and Steel 23.51 Cement 19.20 Refined Petroleum 20.14 Organic Chemicals 20.15 Fertilisers	all sectors 1.0%

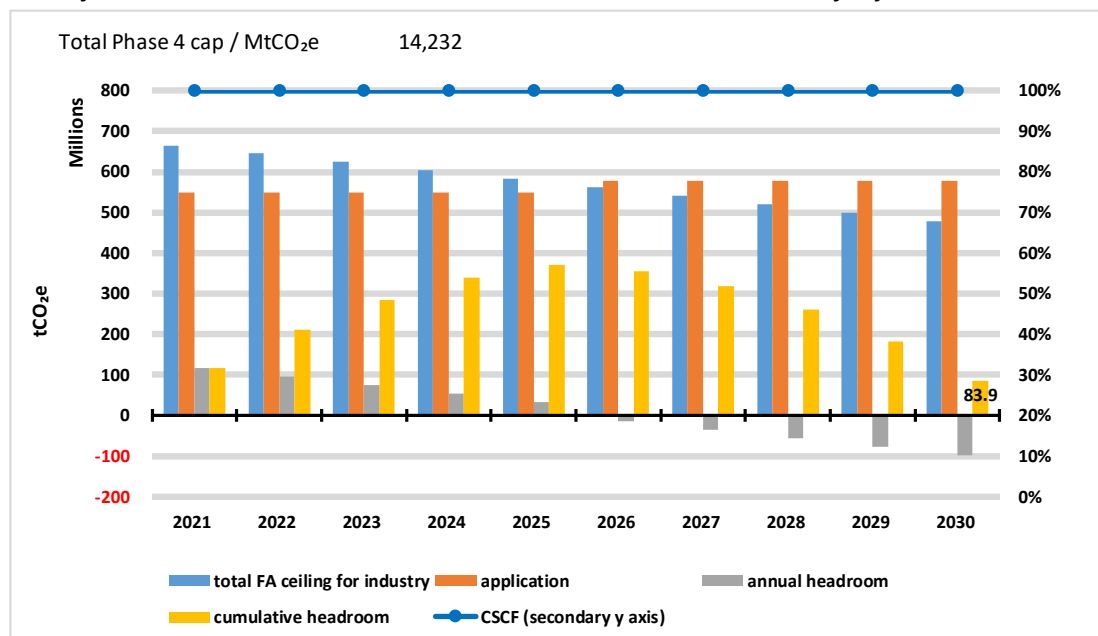
Taking away free allocation from non-carbon leakage exposed sectors would free up allowances for activity growth of 1% across all sectors, as seen in the chart below.

Chart 17. Tiering option 2 with 1% growth, with surplus reduction, with innovation support allowances taken from the auction share and with smaller benchmark reductions for some sectors



If NACE sectors 24.10 Iron and Steel and 23.51 Cement also have -1.0% benchmark reductions, this tiering allows room for more than 2% activity growth across all sectors, as shown in the next chart.

Chart 18. Tiering option 2 with 2% growth, with surplus reduction, with innovation support allowances taken from the auction share and with smaller benchmark reductions for just three sectors instead of five

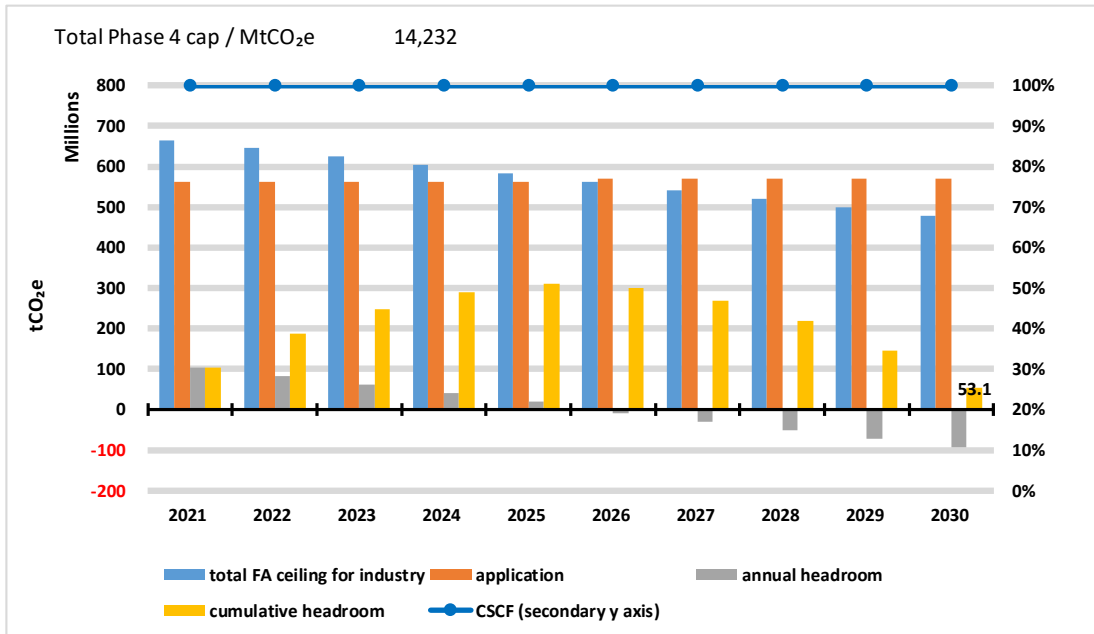


5.3 Tiering option 3

Innovation Support	Carbon Leakage protection	Benchmark reductions	Activity growth
400 million from auction share	tiered with 100% 2.5 75% 1.0 50% 0.2 10% rest	all sectors -1%, except -0.5% for 24.10 Iron and Steel 23.51 Cement 19.20 Refined Petroleum 20.14 Organic Chemicals 20.15 Fertilisers	all sectors 1.0%

Raising the highest threshold from 1.6 to 2.5 reduces the share of the available allocations received by NACE 20.14 Organic Chemicals. Choosing a lower percentage of benchmark for the next highest threshold (75% instead of 80%) reduces the share received by NACE 23.51 Cement and by NACE 19.20 Refined Petroleum. These changes leave room for 10% allocation to non-carbon leakage exposed sectors without triggering a CSCF. This is illustrated in the next chart.

Chart 19. Tiering option 3 with 1% growth, with surplus reduction, with innovation support allowances taken from the auction share and with smaller benchmark reductions for the five top sectors



These examples illustrate the interdependence of the variables determining the maximum number of allowances available under the cap and their distribution across the system’s participants. Tightening one variable leaves room for flexibility for others. There are many possible tiering options which can provide this flexibility. If product activities at installations and sub installations are categorised appropriately and the carbon leakage assessment criteria kept up to date, it should not prove difficult to recalculate free allocations in a predictable manner.

6 Conclusions & Recommendations

Sandbag's modelling confirms, not unexpectedly, that moving from a binary carbon leakage protection approach to a targeted approach for Phase 4 makes room for flexibility in the other variables influencing the maximum number of allowances available for free allocation and their distribution across industry sectors. In particular, a targeted approach to free allocation for Phase 4 provides sufficient allowances, under reasonable benchmark reduction expectations, to the industries most exposed to carbon leakage without decreasing the auction share and whilst still allowing for a significant reduction in the starting point for Phase 4. Targeted approaches provide flexibility for avoiding a cross-sectoral correction factor and leave very highly exposed industry sectors with their full benchmarked free allocation application.

If a binary approach is continued post 2020 then either the aim of the EU ETS to use auctioning as its intended default method for releasing allowances to the market will need to be ignored and the auction share reduced - or - significant benchmark reductions will be needed to avoid a cross-sectoral correction factor for any economy-wide growth scenario - even without addressing the surplus issue. Far from allowing the auction share to be reduced to avoid a cross-sectoral correction factor whilst maintaining a binary approach to carbon leakage protection, Sandbag recommends that the auction share should be increased in the event of comparative efforts for mandatory emissions reductions outside the EU ETS region.

Removing allocation from non-carbon leakage exposed sectors, or at least significantly reducing it, frees up allowances for exposed sectors with less potential to reduce their benchmarks. It also allows room for more activity growth and for reduction of the surplus, all without triggering a cross-sectoral correction factor.

It is important to be as fair as possible when assessing emissions intensity and trade intensity because just a few key NACE sectors dominate the distribution of the free allocation share under the cap regardless of whether a binary or a targeted approach is used for carbon leakage protection. It is also important to ensure that the approach followed to assess whether sectors are genuinely at risk of carbon leakage is kept up to date with mandatory carbon pricing developments in regions outside the EU ETS.

If the allowances to be auctioned to raise funding for innovation support are taken from the auction share rather than from the free allocation share, there is no need to divert Phase 3 allowances from the Market Stability Reserve for the Phase 4 New Entrants Reserve – even under other parameter settings which reduce the maximum number of allowances available for free allocation.

Realigning the start of the Phase 4 cap to reflect emissions reductions already achieved by the end of Phase 3 will significantly reduce the surplus without increasing the rate at which emissions need to continue reducing in order to remain under the cap.

Sandbag, therefore, recommends the following reform choices to tame the surplus whilst avoiding a CSCF:

- ***use a targeted rather than binary approach for carbon leakage protection,***
- ***realign the 2020 starting point for calculating the Phase 4 cap (to reflect the reality of where emissions have reached),***
- ***take all Phase 4 New Entrant Reserve (NER) allowances from the Phase 4 cap (to avoid augmenting Phase 4 with surplus Phase 3 allowances),***
- ***retire unallocated Phase 3 allowances, or at least leave them in the Market Stability Reserve (MSR),***
- ***take all Innovation Support allowances from the auction share of the Phase 4 cap,***
- ***increase the auction share in the event of comparative efforts for mandatory emissions reductions outside the EU ETS region.***

Furthermore, to enable appropriate public scrutiny of the EU ETS, we recommend that the EU Transaction Log should be enhanced to share:

- regular updated mappings of installations to NACE⁷⁶ sector codes,
- information on allowance transfers related to heat and gas transfers.

⁷⁶ NACE is the “statistical classification of economic activities in the European Community” and is the subject of legislation at the EU level, which imposes the use of the classification uniformly within all member states

7 Appendix: Summary of methodology

Free allocation data available in the EU Transaction Log for Phase 3 reflects the benchmarked free applications after the application of various factors related to the type of products being made at the installation (i.e. carbon leakage exposed or not, combined heat and power (CHP) or not, district heating above the usual heat benchmark or not).

Sandbag has calculated backwards from Phase 3 free allocations per installation to identify benchmarked free allocation applications for carbon leakage exposed product activity and for non-carbon leakage exposed product activity. Allocations under Article 10c of the EU ETS Directive to power installations are not taken into consideration as these come from the auction share.

This approach of calculating backwards also identifies installations whose free allocation has been reduced during the phase due to partial cessation and it has identified CHP installations.

For installations with partial cessation, our modelling assumes that the current standard free allocation is based on their current activity levels. Free allocations from the Phase 3 New Entrant Reserve (NER) are also assumed to be based on current activity levels. For installations without partial cessation so far in Phase 3, we use differences in emissions from the start of the phase to current levels as a proxy for differences in activity. The calculated end Phase 3 benchmarked application values and installation type flags are used as the starting point to model free allocation applications for the first half and the second half of Phase 4.

Production level data by installation is not shared publicly so Sandbag's model is currently set up to apply an on-going annual percentage change in activity. This change can be applied either economy-wide or NACE code by NACE code. The model assumes the same annual percentage change across the whole phase (i.e. for two years from 2015 to 2017 for the first half of Phase 4, and for seven years from 2015 to 2022 for the second half).

So far, the Commission has not shared up to date mappings of which installations belong to which NACE code. A reference file⁷⁷ was shared in March 2014 but many new installations have joined the system since then. Additional NACE code mappings for significantly emitting new installations have been identified via in-house desk based research.

Sandbag's modelling applies these NACE code mappings when determining emissions intensities and trade intensities for carbon leakage exposed product benchmarked applications. With the exception of a few sectors where these figures were obviously changed for the Impact Assessment (IA) accompanying the Commission's Reform Proposal, we have used the Commission's March 2014 figures on carbon leakage exposure by NACE sector⁷⁸. Our model

⁷⁷ Classification of installations in the EUTL Registry based on the NACE 4 statistical classification

http://ec.europa.eu/clima/policies/ets/cap/leakage/studies_en.htm

⁷⁸ http://ec.europa.eu/clima/policies/ets/allowances/leakage/docs/carbon_leakage_detailed_info_en.pdf

assumes non-exposed carbon leakage status for products made at installations mapped to NACE codes for which there are no carbon leakage assessment figures available. Our model also assumes non-exposed carbon leakage status for products made at installations for which we do not know the NACE code. This means that, depending on the carbon leakage protection thresholds selected, some installations providing district heating might be allocated 0% of their heat benchmarked application.



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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