



CLIMACT

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to act on climate change

IS THE EU ETS PROPOSAL FIT FOR 55%?

AN ANALYSIS OF THE COMMISSION'S PROPOSAL FOR THE EU ETS REVISION

REPORT

25 JANUARY 2022

This briefing has been commissioned by the European Climate Foundation (ECF) with a view to providing a basis for discussion and engagement between stakeholders and policy-makers. Any use of the information contained within this briefing is to be considered independent from ECF.

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GLOSSARY

CSCF	The Cross-Sectoral Correction Factor: the factor that reduces allocations for all installations in a uniform way if the demand for free allocation is larger than the maximum amount of allowances available for free allocation.
EUA's	European Union Allowances: the unit which allows ETS operators to emit 1 ton of CO _{2eq.} in a given year. All operators (stationary, maritime, aviation) can use this allowance type.
EUAA's	European Union Aviation Allowances: the unit which allows aviation operators to emit 1 ton of CO _{2eq.} in a given year. Only aviation operators are allowed to use this allowance type.
Innovation Fund	A fund that is created under the EU ETS to support innovation. Revenues from allowances auctioned by this Fund will be used to finance innovation through demonstration projects.
Intake rate	The amount of supply that is reduced by the MSR, expressed as % of the calculated TNAC.
Modernisation Fund	A fund that is created under the EU ETS. Revenues from allowances auctioned by this Fund will be used to finance the modernisation of energy systems in specific (lower-income) member states.
MSR	The Market Stability Reserve, in force as of 2019, which adjusts supply in function of the TNAC.
New Entrants Reserve	A separate reserve of ± 400 million allowances which is used to provide free allocations to new installations or existing installations which see their production levels increase. The allowances are leftovers from phase 3 (2013-2020), and thus come on top of the phase 4 cap (2021-2030). On the other hand, non-allocated allowances from installations that see a decrease of their production levels will also be put in this reserve instead of being allocated to the market.
TNAC	Total Number of Allowances in Circulation: the indicator that determines if and how supply is adjusted via the MSR. The indicator is calculated by comparing cumulative supply with cumulative demand since 2008.
3% buffer	The ETS Directive provides that 57% of the cap is auctioned. Of this 57%, 3 percentagepoints are put aside and can be used for free allocation if necessary to avoid or at least reduce the CSCF. If less than 3% is needed for this, 50 million allowances are auctioned under the IF, an amount equal to 0,5% of the cap is auctioned under the MF, and the rest will be auctioned by member states.

MAIN CONCLUSIONS

- Under the Commission’s proposal – and assuming emissions decrease in line with the Commission’s “Fit for 55%” policy scenarios – the surplus of allowances would decrease to around 450 million allowances by 2026. However, it would then start to increase again to reach 550 million allowances by 2030.
- There are three reasons why the surplus would start to increase again after 2026:
 - Despite a one-off reduction and a more stringent LRF, emission levels would still remain significantly below the cap throughout most of the period 2021-2030;
 - Due to the 3% buffer mechanism, actual supply of allowances will exceed the theoretical cap after 2026;
 - The proposed changes to the MSR would lead to less allowances being absorbed by the system as soon as the TNAC indicator drops below 1096 allowances.
- A surplus of 550 million allowances is at the upper end of expected hedging demand and could endanger achievement of the reduction objective by 2030. At worst, the emission budget under the system would allow emissions to be reduced with -57 to 58% instead of the envisaged -62% (2030 compared to 2005).
- To further bring down the surplus, either a lowering of the MSR thresholds or a stronger one-off cap adjustment could be considered. The first option would only impact member states auctioning volumes, whereas the second option would also impact free allocation levels and the Modernisation Fund. A strongest reduction of the surplus would be achieved when both options are combined, with a higher degree of certainty that the -62% reduction objective for the ETS sectors by 2030 will be met.
- Free allocation is expected to decrease for all sectors, due to a phase-out (for sectors covered by a CBAM) and a higher benchmark improvement rate. The decrease is expected to be largest for the steel, cement and aluminium sector (-50%*), and lowest for the refinery, mineral wool and glass sectors (-10%*). For most other sectors, the decrease ranges between -20 and -35%*. This means industries will have to accelerate their reduction efforts to avoid carbon costs.
* by 2030 compared to 2021
- The auctioning volumes are expected to decrease for all member states. On average, the decrease amounts to -21%, with a higher impact expected for higher-income member states (-25% on average) compared to lower-income member states (-17% on average) after taking into account allowances auctioned through the Modernisation Fund. However, the decrease in volumes would probably be more than offset by a higher carbon price, meaning overall revenues are expected to be higher compared to the current Directive. Available funds for climate action would increase as the proposal would require all revenues to be spent on climate action (compared to a 50% recommendation under the current Directive).
- On the other hand, auctioning volumes are expected to increase considerably for the Modernisation Fund (+26% to 808 million allowances in total) and even more so for the Innovation Fund (+124% to over 1 billion allowances). Together with a strong carbon price, these Funds will become ever more important tools to support the transition in the different sectors and Member States.

CONTEXT AND OBJECTIVE OF THIS BRIEFING

The EU ETS revision is one of the key proposals to deliver the increased ‘at least -55% reduction objective’

In July 2021, the EU Commission published its highly anticipated “Fit for -55%” package, a set of 12 legislative proposals to put the EU on track towards at least 55% greenhouse gas (GHG) emission reductions by 2030 compared to 1990. One of the key elements of the package is a proposal to revise the EU’s emissions trading system (European Commission, 2021a), which has been operating since 2005 and was last revised in 2018.

Overall, the proposed changes in this legislative proposal can be summarized as follows:

- **Adjustment of the emission cap to align with the -55% reduction objective**, through an increased annual reduction (the Linear Reduction Factor or LFR) and a one-off downwards adjustment of the cap;
- **Extension of emissions trading to new sectors**, by including the maritime sector in the existing EU ETS, and the creation of a separate ETS for road transport and buildings (ETS BRT);
- **Leveraging more financial means to support the transition**, by increasing the size of the Modernisation Fund, the Innovation Fund, and a stronger earmarking of national auctioning revenues for climate measures (including via the proposed Social Climate Fund);
- **Strengthening incentives for industrial sectors**, i.a. by changes to the free allocation rules, the introduction of Carbon Contracts for Difference and specific rules to account for Carbon Capture and Utilization (CCU) technologies;
- **Changes to the Market Stability Reserve** to increase predictability and better ensure it brings the Total Number of Allowances in Circulation (TNAC) within the desired volume bandwidth.

Due the extension of emissions trading, the proposal would cover 80% of the expected, remaining GHG emissions by 2030, of which 43% by the existing EU ETS and the other 37% by the new system for transport and buildings. As such, the importance of the proposal cannot be underestimated.

This report provides a first analysis of the proposal and its expected impact on the existing EU ETS

The objective of this report is to support decision makers and stakeholders in better understanding the implications and interactions between the different elements of the Commission’s proposal, and their impact on a number of key parameters. Since its creation in 2005, the EU ETS has become a highly complex system with many interlinkages. This has made it difficult for many to fully understand the combined impact of different design options on key parameters such as expected supply, demand, surplus evolution, free allocation levels and auctioning volumes. To help navigate the complexities of the EU ETS, Climact has developed a detailed ETS model which simulates the impact of different policy options. This model is published together with this report, and is publicly available for use. This report is based on that model and maps the expected impact of the Commission proposal on a number of key parameters.

The report **focuses only on the existing EU ETS, and does not cover the newly proposed separate system for buildings and road transport**. Its main aim is to assess the expected impact of the Commission’s proposal on the following key parameters:

- **The total available emission budget of the proposal, and the expected supply-demand balance up to 2030.** Under this section, we will also assess to what extent the proposal ensures delivery of the required reductions to achieve the overall ‘at least -55%’ GHG reduction objective;
- The expected **levels of free allocation** for the different industrial sectors;
- The expected **auctioning volumes** for the different beneficiaries (different Funds as well as the Member States).

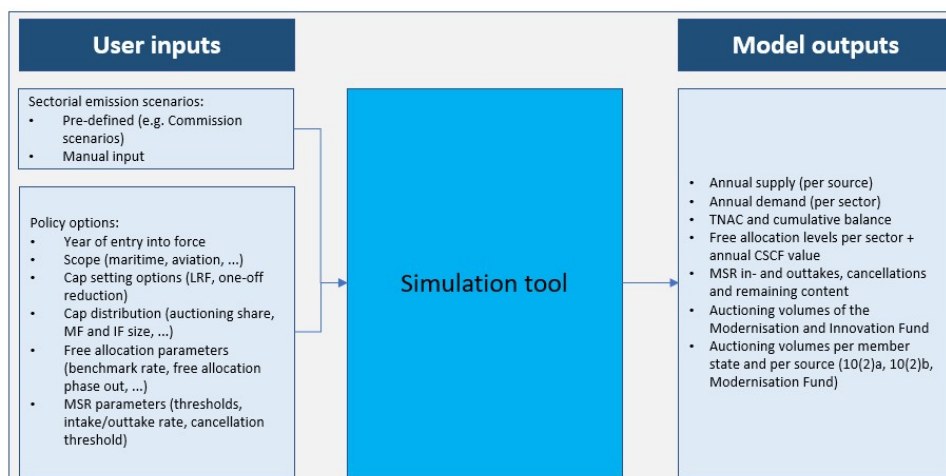
To this end, the report is structured as follows: first, a brief description is given of the model and the underlying assumptions used for this analysis. Secondly, the expected impact of the proposal on each of the key parameters is provided and explained. Main conclusions are listed at the beginning of the report.

CLIMACT’S ETS SIMULATION MODEL

How it works

Climact has developed an ETS model which simulates the functioning of the EU ETS based on different possible assumptions and policy options. The model requires the user to decide on some inputs: firstly, it has to decide which emission scenarios will be used in the model. These can be differentiated per sector (power, industry, maritime and aviation) and can be either pre-defined scenarios (for example Commission’s policy scenarios from its Impact Assessment accompanying the legislative proposal) or own-defined scenarios. The user then has to decide on a wide range of policy options and other assumptions. Based on these inputs, the model then simulates the functioning of the EU ETS, and provides a number of outputs, covering annual supply (per source), demand (per sector), free allocation levels (per sector) and auctioning volumes (per beneficiary).

Figure 1: overall logic of the Climact ETS model



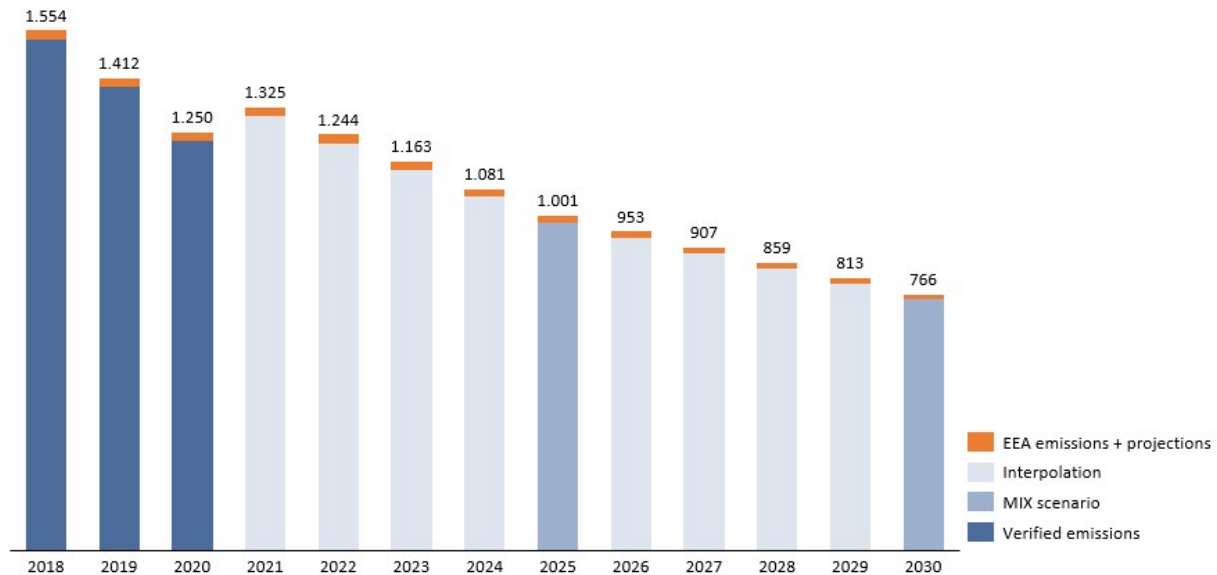
Model inputs used for this briefing

To assess the impact of the Commission’s proposal, the inputs to and functioning of the model were aligned as much as possible with the proposal and its accompanying impact assessment.

The emission scenario used are closely aligned with the emission scenarios from the Commission’s Impact Assessment. For stationary installations, the scenario used starts from 2020 verified emission levels. In 2021, a limited rebound is assumed following the post-COVID recovery and high gas prices which trigger a shift back from natural gas to coal for power generation. From there on, emissions follow linear trajectories to reach the 2025 and 2030 emission levels of the Commission’s MIX scenario. Finally, a similar emission trend was applied for the three EEA countries which are not included in the MIX scenario.

It should be noted that the resulting emission scenario includes ambitious emission reductions – in line with the required efforts to reach the overall -55% reduction objective - which will have to be driven by both a strong carbon price as well as other EU and national policies to increase energy efficiency and renewable energies. More info on the underlying assumptions of the Commission’s MIX scenario can be found in the Impact Assessment accompanying the ETS revision proposal.

Figure 2: stationary emission projections used for the analysis (in Mt CO_{2eq.})



For the maritime sector, it was assumed that emissions would first follow the Commission’s REF scenario until 2023, and then decrease in line with the MAR1 scenario as the sector is fully included in the EU ETS as of 2026. For aviation, the emission trend follows the same trajectory as Eurocontrol’s ‘2021 vaccine’ scenario for its five-year flight number projections. The resulting trend is comparable to the Commission’s MIX scenario (which only provides figures for intra+extra EU aviation combined).

The Directive is assumed to enter into force in 2023, which would mean the new rules would apply as of 2024. The assumed policy options are fully aligned with the Commission’s proposal. The linear reduction factor is increased to 4.2%, implying an annual reduction of +/- 82 million EUA’s each year.

In line with the Commission's proposal, the cap is further reduced one-off in 2024 (with 117 million EUA's) but also increased by 79 million EUA's following the extension to the maritime sector. The share for maritime in the cap is also assumed to be reduced with an LRF of 4.2%, decreasing the cap with an additional 4 million EUA's per year. The auctioning share is maintained at 57% (including a 3% buffer), but an additional 2,5% is shifted from member states' auctioning volumes to the Modernisation Fund as of 2023. The Innovation Fund is also increased with an additional 50 million, of which 15 million from the auctioning share and 35 million from the free allocation share. Member states continue to auction the remaining allowances from the auctioning share, based on the existing distribution key (with no revenues dedicated for the EU's own budget).

With regard to free allocation levels, activity levels are assumed to remain constant¹. The upper threshold for the benchmark improvement rate is increased to 2,5% for the period 2026-2030 as proposed by the Commission. It is assumed there is no net-outflow from the New Entrants Reserve. For the cement, steel, fertilizers and aluminium sector, free allocation levels are reduced by 10% each year, starting in 2026, following the implementation of Carbon Border Adjustment Mechanisms, as foreseen by the Commission proposal. The allowances that are consequently not allocated to these sectors, are auctioned under the Innovation Fund.

The MSR is also assumed to function in line with the Commission's proposal as of 2024. The existing thresholds remain unchanged and the 24% intake rate is maintained after 2024. A lower intake rate is applied when the TNAC is above 833 million but below 1096 million EUAs. The TNAC calculation is adjusted to take into account the impact of maritime and aviation, starting from 2024. Finally, as of 2024, all allowances in the MSR above 400 million EUA's are invalidated.

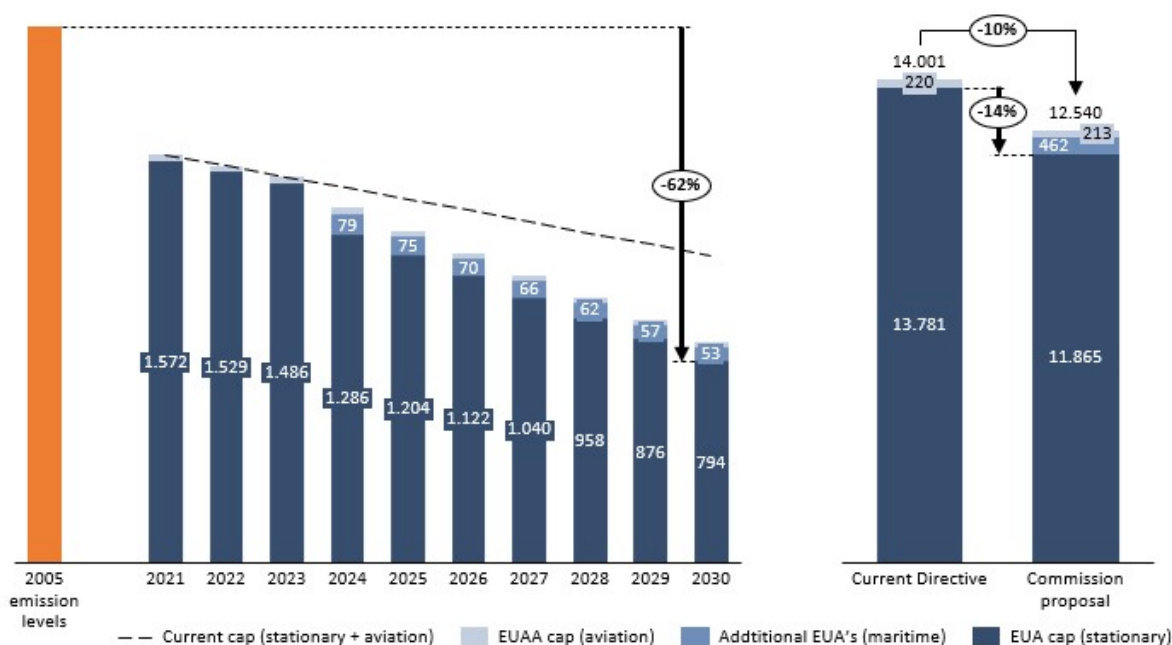
EXPECTED IMPACT ON THE OVERALL EMISSION BUDGET AND SUPPLY-DEMAND BALANCE

The ETS cap decreases significantly under the Commission's proposal

As of 2024, the higher LRF would increase the annual reduction of the cap from 43 to 82 million allowances. Furthermore, in 2024 the cap is reduced with an additional 117 million EUA's due to the one-off adjustment, but at the same time it is increased with 79 million EUA's following the extension to the maritime sector. By 2030, the cap for stationary installations is 62% below 2005 emission levels.

¹ This is different from the Commission's IA, which expects growth in most industrial sectors. See the Impact Assessment, part 2, table 41

Figure 3: the ETS cap under the Commission’s ETS revision proposal per year (left) and for the entire 2021-2030 period (right) (in Mt CO_{2eq})



For the whole period 2021-2030, the Commission’s proposal would reduce the ETS cap from 14.001 million allowances (13.781 million EUA’s and 220 million EUAA’s) under the current Directive to 12.540 million EUA’s (12.327 EUA’s and 213 million EUAA’s), or a reduction of -10%. This is including the additional cap budget provided for the maritime sector. For stationary installations alone, the total cap volume is reduced to 11.865 million EUA’s (-14% compared to the current Directive).

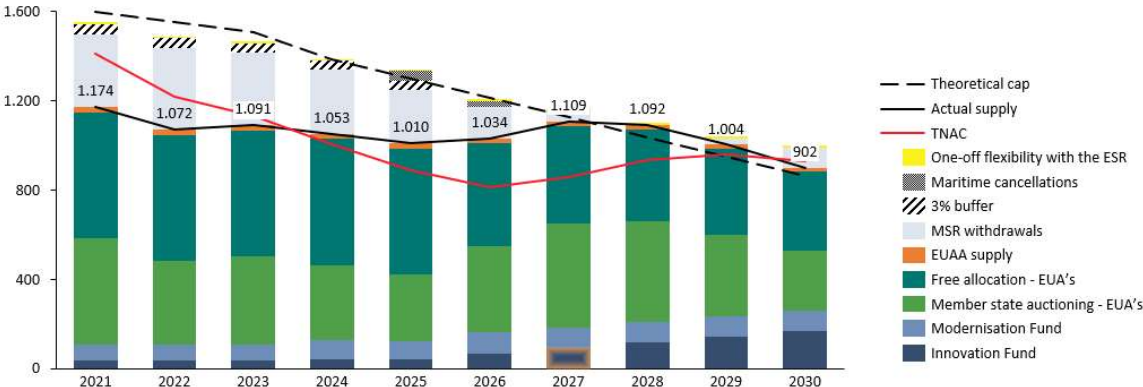
It is thus clear that the Commission’s proposal will significantly tighten the emission budget for the period 2021-2030, at least in theory. In practice, the actual supply under the EU ETS can diverge significantly from the theoretical cap, due to specific design elements such as the MSR, allocation rules and the shifting of supply between different years. Therefore, the next sections explore actual expected supply, how this compares with annual demand (emissions), and what this means for the evolution of the surplus.

Actual supply is expected to remain far below the cap in the period 2021-2025, and then increase slightly above the cap throughout 2026-2030

When taking into account the different dynamics of the EU ETS, the actual supply is expected to be far below the cap in the period 2021-2026. This is mainly because of the MSR, which is expected to withdraw significant volumes of supply until 2026, as the TNAC remains above the 833 million

threshold until 2025². Another important factor is the 3% buffer rule which is already included under the existing ETS Directive, and which is maintained under the Commission’s proposal. Under this rule, each year 3% of the cap (coming from the 57% auctioning share) is set aside as a buffer, which can be used to provide additional free allocation and therefore reduce or delay the reduction of free allocation levels through a Cross-Sectoral Correction Factor (CSCF) if needed. This rule was introduced in the 2018 ETS review, to address concerns that other rules (benchmark strengthening, carbon leakage provisions, ...) might not be sufficient to avoid the triggering of this CSCF. In case the CSCF would be triggered, the 10% most efficient installations in carbon leakage-exposed sectors would receive insufficient allocations to cover 100% of their emissions, which the legislators considered undesirable. If the 3% buffer is not (entirely) needed to avoid a CSCF, it is divided between the Innovation Fund (up to 50 million EUA’s), the Modernisation Fund (up to an additional 0,5% of the cap) and member state auctions (all remaining EUA’s in the buffer) in the period 2026-2030. Regardless of its end use, this buffer leads to a *de facto* backloading³ of 3% of the cap from the period 2021-2025 to the period 2026-2030, which further reduces the supply below the cap in the period 2021-2025. A third factor is the cancellation of part of the cap for the maritime sector: as the surrendering requirement for maritime operators is gradually phased in, the Commission’s proposal includes a provision to cancel a number of allowances to compensate for the difference between verified emissions and surrendered allowances. This further reduces the actual supply in the years 2024-2026.

Figure 4: actual supply versus the theoretical cap under the Commission’s proposal (in Mt CO_{2eq.})



² Firstly there is still a significant surplus carried over from the period 2013-2020, which was increased due to significant emission drop in 2020 following the COVID-19 pandemic. Secondly, the emission scenario used assumes further reductions in coming years, causing demand to be only slightly higher than supply, resulting in a slow-paced reduction of the surplus. Finally, demand from aviation will not be taken into account for the TNAC calculation until in 2024, meaning that net demand from aviation does not lead to a lower intake by the MSR until 2025.

³ Backloading = a term to describe that part of the cap for a given year would only be brought to the market via auctioning or free allocation in a later year

As of 2027, the supply is expected to increase again, as the MSR will withdraw fewer allowances. In the period 2028-2030, the supply is even expected to slightly exceed the theoretical cap. At one hand, The MSR will stop withdrawing large volumes of supply as the TNAC decrease to a level close to the 833 million threshold⁴. On the other hand, the supply will increase because of the 3% buffer which was 'backloaded' from the previous five-year period is brought to the market, which causes the supply to exceed the theoretical cap for those years.

Despite a more stringent cap and changes to the MSR, the surplus is expected to increase again in the period 2026-2030

The lower supply in the period 2021-2026 leads to a gradual reduction of the surplus on the market, from +- 1.350 million EUA's in 2020 to about 450 million EUA's in 2026⁵. However, the bump in supply in the years 2027-2030 causes the surplus to increase again, reaching 580 million EUA's in 2029. It then starts to decline again as of 2030, as the MSR starts withdrawing larger volumes again.

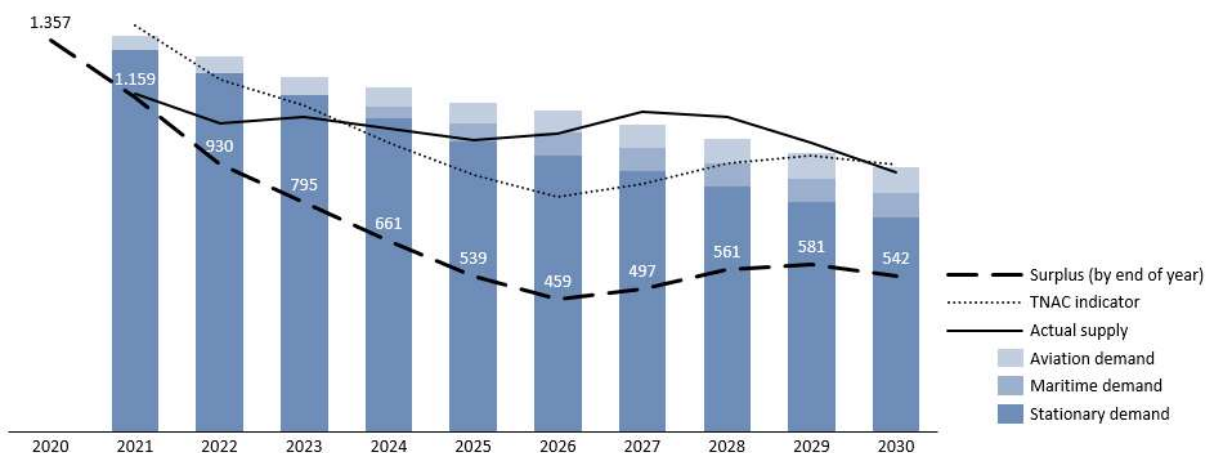
As shown in Figure 5 before, there is a gap between the actual surplus on the market and the TNAC indicator calculated under the MSR. This is because the actual surplus takes into account the net demand for EUA's from the aviation sector, which is (not) yet taken into account for the TNAC calculations. This gap increases every year until 2023, as the annual net demand from aviation continues to drive down the surplus without changing the TNAC indicator. However, it is assumed that as of 2024 – in line with the Commission's proposal – the net demand from aviation is also taken into account in the TNAC calculation from that year onwards. As a result, the gap remains constant in subsequent years, at a level equal to the cumulative net demand from aviation from 2012 until 2023.

This evolution clearly shows the multi-year time lag in the system: the supply outgrows demand in 2026, which leads to a growth in surplus as of 2027, which leads to withdrawals by the MSR as of 2028. The decline in in supply as of 2028 leads to a net-deficit in 2029, which decreases the surplus again as of 2030, and consequently the MSR is expected to stop withdrawing again as of Q4 of 2031.

⁴ Under the Commission's proposal, the MSR would withdraw the difference between the TNAC and the 833 million threshold in case the TNAC is between 833 and 1096 million allowances. Therefore, if the TNAC is slightly above 833 million, the impact of the MSR will be limited.

⁵ by the end of year, so taking into account supply and emissions until 31/12/2026

Figure 5: expected supply and demand and evolution of the surplus



It can be discussed whether the persistence of a surplus of between 450 and 580 million EUA's in the system should be considered a problem or not. The Commission has proposed this approach, as it deems a surplus between 400 million and 833 million allowances to be necessary to meet hedging demands and ensure a proper functioning of the carbon market. If this reasoning is followed, then the system seems to be effective at reaching that goal, with the surplus fluctuating within this bandwidth between 2023-2030.

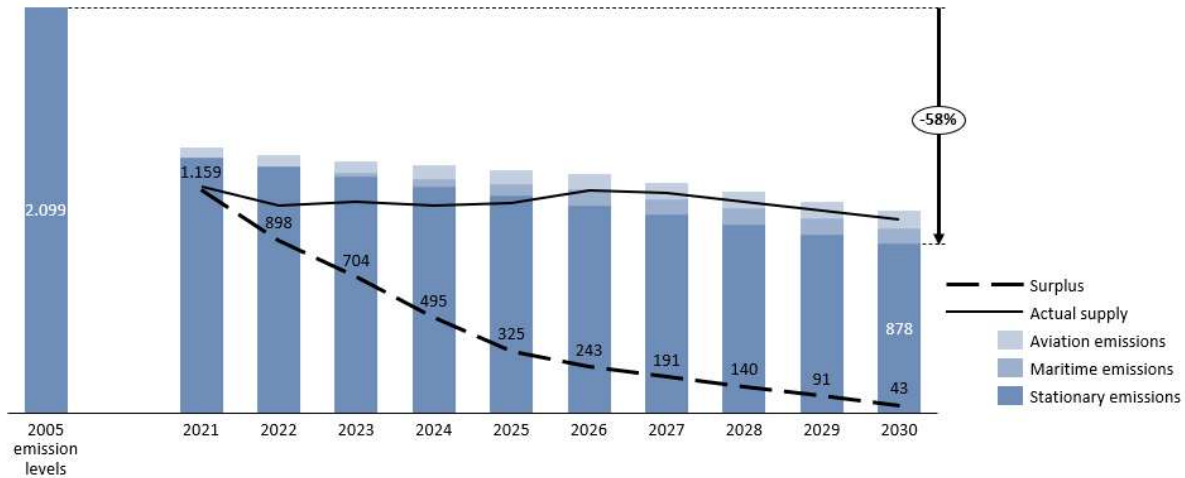
However, this underlying objective of maintaining such a surplus can be discussed in itself. There are two main elements to assess what surplus should be allowed to exist under the system:

First of all, **a certain surplus is considered required by the Commission (and several stakeholders) to ensure liquidity and meet expected hedging demand.** The main argument for maintaining a certain surplus in the system when the MSR was initially developed, is that it is required to meet hedging demand from ETS operators. The bandwidth of 400 to 833 million allowances was agreed in 2015/2016, based on the perceived hedging demands from the power sector at that time. However, since then the UK left the system, and the power sector in the rest of the EU has been decarbonizing at a fast pace. On the other hand, lower free allocation levels for industry and aviation is expected to put an upward pressure on hedging demand. Nevertheless, a study by Vivid Economics for the European Commission expects overall hedging demand to decrease over time, ranging between 300 and 600 million by 2030 (Vivid Economics, 2021). The projected surplus in this report stays within this range.

A second element to take into account is the environmental integrity of the system, as **a too high surplus in the system could allow emissions to reduce less than what would be required to meet the overall, economy-wide -55% objective.** In theory, the Commission's proposal could allow stationary emissions to be reduced with only 57 to 58% compared to 2005, compared to the 62% reduction required to meet the overall, economy-wide -55% objective, as shown in figure 6 below. Although this theoretical scenario is unlikely to materialize (as the surplus would fall close to zero,

prices would increase significantly, triggering additional abatement), it illustrates that a prevailing surplus of even 500 to 600 million allowances could endanger achievement of the 2030 objective.

Figure 6: supply, demand and surplus evolution under a -58% reduction scenario (in Mt CO_{2eq.})



Lower MSR thresholds and/or a stronger one-off adjustment of the cap are both effective at further limiting the surplus

In this section, two main options are assessed to further strengthen the system: **adjustments to the MSR thresholds**, and a **stronger one-off cap reduction**.

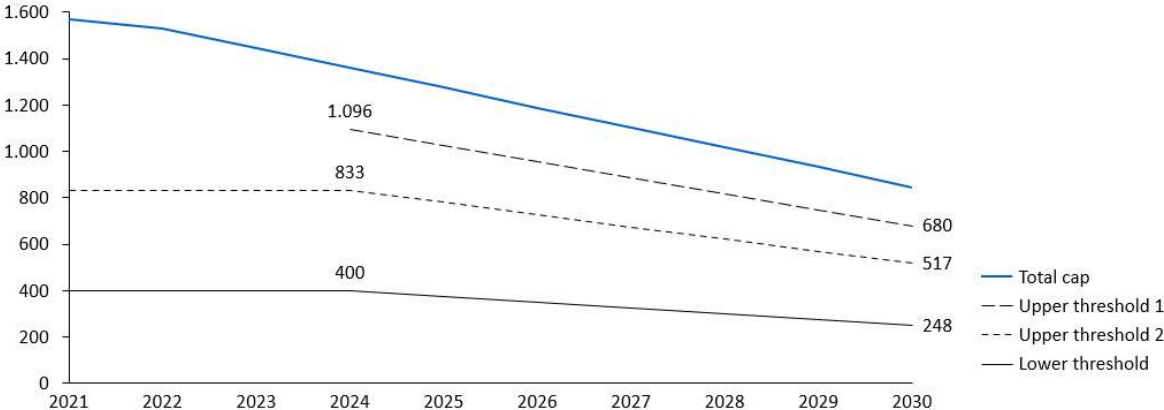
The first option would be to lower the thresholds that trigger the flow of allowances in and out the MSR. Many possibilities could be envisaged to this end. The Commission is proposing to maintain the current thresholds of 400 and 833 million allowances, and to add a third threshold of 1096 allowances, with the following rules:

- As long as the TNAC is above 1096 million, 24% of the TNAC is withdrawn by the MSR
- If the TNAC is between 1096 and 833 million, the difference between the TNAC and the 833 million threshold is withdrawn
- If the TNAC is between 833 and 400 million, the MSR does not intervene
- If the TNAC drops below 400 million, the MSR will release 100 million allowances on the market.

This option – which was not included in the Commission’s Impact Assessment – reduces the impact of the MSR compared to as it is now, because fewer allowances will be withdrawn once the TNAC drops below 1096 allowances. It should be noted that all policy options in the Commission’s Impact Assessment foresaw a lowering of the upper threshold from 833 to 700 million, and in some options the threshold would then further decline in line with the cap.

In this briefing, an alternative is explored where the MSR functions along the same mechanisms as proposed by the Commission, but the thresholds evolve in line with the cap. As shown in figure 8 below, this approach would lower the thresholds to +- 680, 515 and 250 million allowances by 2030 respectively.

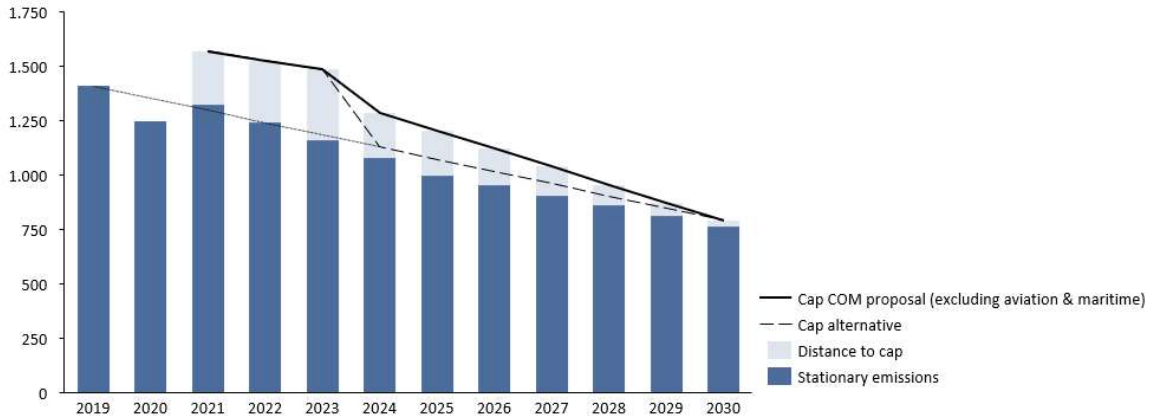
Figure 7: alternative MSR thresholds, decline in line with the ETS cap (in Mt CO_{2eq.})



A second option to further reduce the surplus is to strengthen the one-off reduction of the cap compared to the Commission’s proposal. For most of its existence, the EU ETS cap has been significantly above actual emissions due to faster than expected reductions, which led to a significant surplus throughout phase 3 (2013-2020). For 2021, the cap is expected to be more than 200 million allowances (or 15%) above projected emissions. **The Commission’s one-off cap reduction partially addresses this, but it would still leave the cap significantly above projected emissions⁶ for a large part of phase IV,** as illustrated in figure 8. An effective solution would be to base the one-off reduction by using verified emissions as a starting point, similar to the approach currently used under the Effort Sharing Regulation (European Parliament and the Council, 2018). For example, figure 8 below illustrates an alternative where the cap is changed based on a linear trajectory between 2019 verified emissions (the latest year of ‘representative’ verified emissions, before the COVID pandemic) and the desired end point in 2030. This would lead to a higher one-off reduction in the year after entry into force (-300 million allowances in total, if the Directive enters into force in 2023), but also a much softer LRF (-2.9% instead of -4.2%) to achieve the required reductions by 2030. As a result, the cap would be much better aligned with projected emissions, reducing the need for the MSR to sweep up the surplus.

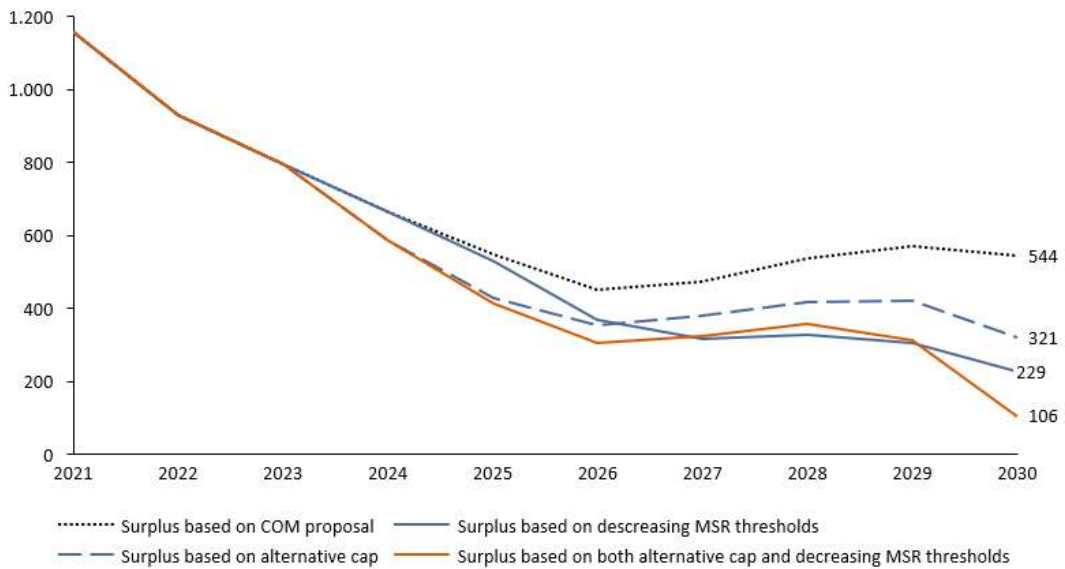
⁶ Assuming a linear trajectory towards the 2030 objective after a limited rebound in 2021, see figure 3

Figure 8: cap vs. projected emissions in 2021-2030 (in Mt CO_{2eq})



Both options have a comparable impact on the surplus. Under a stronger one-off reduction, the surplus would decrease rapidly to +/- 400 million allowances by 2025 and would fluctuate between 300 and 400 million until 2030. Decreasing thresholds under the MSR would take slightly more time to decrease the surplus, but it would continue to do so bringing it close to 230 million by 2030. The strongest reduction would happen if both options are combined: under this approach, the surplus would decline to 400 million by 2025, and then decrease again as of 2028 to reach 100 million allowances by 2030.

Figure 9: surplus evolution under the different options



Whereas the impact on the surplus is comparable under both options, they are very different in how they impact the other parameters in the system. Adjusting the MSR thresholds would only lower

national auctioning volumes while leaving the rest of the system unchanged. It would affect higher income member states more than lower income member states, as a part of the auctioning volumes of the latter are shielded from the MSR (allowances which are auctioned under the Modernisation Fund and allowances which are auctioned under article 10(2)b of the ETS Directive until 2025). A stronger one-off cap reduction on the other hand would also lower the available amount of allowances for free allocation as well as the size of the Modernisation Fund, thereby also significantly reducing auctioning volumes for lower income member states.

EXPECTED IMPACT ON FREE ALLOCATION LEVELS

The proposal could lower free allocation levels in 4 ways

Free allocation is provided mainly for industrial sectors under the system, as a transitional measure to shield them from the risk of carbon leakage. Under the current Directive, allocation levels are calculated by multiplying 4 factors:

- The activity level of an installation, representing production levels or heat/fuel consumption levels;
- The benchmark value, based on the GHG intensity of the 10% best performing installations;
- The carbon leakage exposure factor (CLEF), which is at 100% for sectors deemed to be exposed to carbon leakage risks (and at 30% to 0% for other sectors);
- A CSCF, which is triggered if the cumulative demand for free allocation (based on the previous 3 factors) exceeds the available amount for free allocation.

The Commission's proposal builds on the existing framework, but could lower free allocation levels in four different ways:

First of all, it proposes **a higher maximum improvement rate for the benchmark update, which will lead to more stringent benchmark values**. Under the current Directive, benchmark values are updated every 5 years, by comparing the original benchmark values (which applied for 2013-2020) with the observed GHG intensity of the 10% best performing installations. The average, annual improvement rate as identified by this comparison is then topped of between 0,2% and 1,6% per year, and then multiplied by the number of years between 2008 and the relevant allocation period⁷ to determine the applicable benchmark value. The Commission now proposes to increase the upper threshold to 2,5%, which will lead to more stringent benchmark values for some sectors where the annual improvement rate is > 1,6%.

⁷ 15 years (from 2008 to 2023) for the allocation period 2021-2025, 20 years (from 2008 to 2028) for the allocation period 2026-2030

Secondly, the tightening of the cap (and to a far lesser extent, the increase of the Innovation Fund) **reduces the amount of allowances available for free allocation**, which increases the probability of triggering the CSCF.

Thirdly, for **those sectors for which Carbon Border Adjustment Measures are proposed, free allocation will be phased out gradually between 2026 and 2035**. This has a major impact on total free allocation levels, as the CBAM proposals covers major emitting sectors such as steel, cement and fertilizers which jointly represent almost 50% of total free allocations. The allowances which are not allocated for free due to this phase-out will be auctioned under the Innovation Fund, meaning that this phase-out does not impact the probability of the CSCF.

Fourthly, there are some further changes to the allocation rules which will further reduce free allocation levels, but for which the exact impact is difficult to quantify. Based on the Commission's proposal, **free allocation will be made conditional on the installation implementing specific energy efficiency measures**, and installations who fail to do so will see their allocation reduced with an additional 25%. Furthermore, the **benchmark definitions will be made technology-neutral** to ensure climate-friendly technologies are treated on par with their fossil incumbents. This could further strengthen benchmark values (as the GHG intensity of the 10% most efficient installations under each benchmark could decline further).

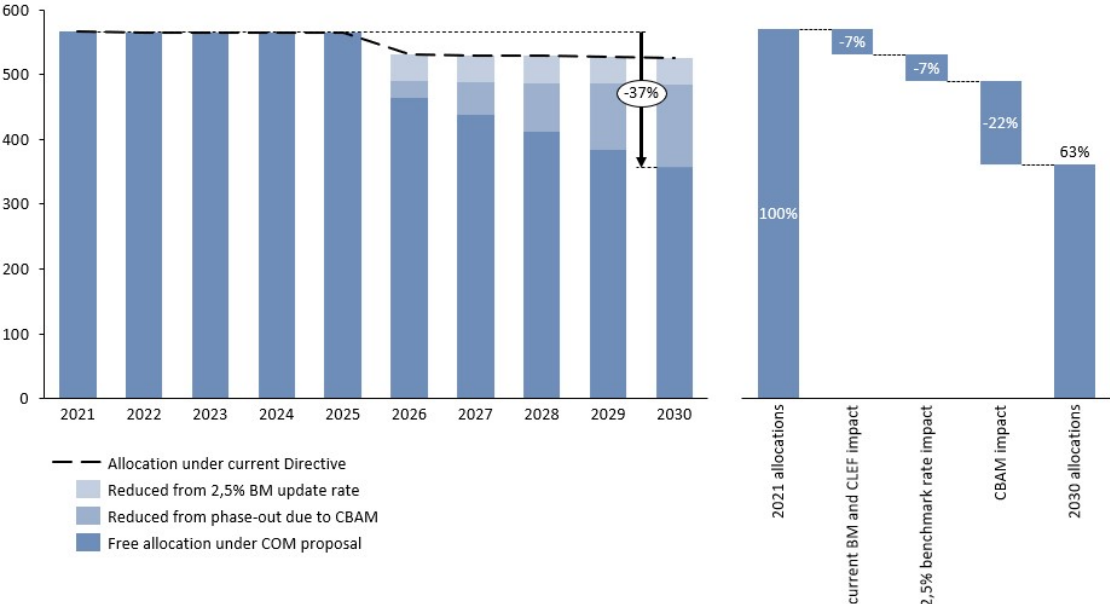
Overall, free allocation levels are expected to decrease by 37% by 2030 compared to 2021. However, this reduction is less steep as the cap, which would reduce by 46% by 2030 compared to 2021.

The analysis below is based on the first three parameters that could lower allocations (benchmark values, CSCF and allocation phase-out in combination with a CBAM). The impact of the fourth parameter is more difficult to predict and has therefore not been taken into account for the calculations below, although it could also have a (significant) impact on allocation levels⁸.

⁸ In particular, the widening of the definition of some product benchmarks can have a significant impact. For example, without such widening it is probable that the benchmark value for hot metal – which accounts for 20% of total preliminary allocations in 2021 – would only be tightened based on the lowest update rate (0,2% per year) for 2026-2030, as the GHG intensity has not reduced significantly compared to the original benchmark value. Furthermore, there are currently only 25 sub-installations in the EU under this product benchmark, which means that the benchmark value is set based on the 2 to 3 best performing sub-installations (European Commission, 2021b). However, it is probable that the definition of this benchmark – which refers specifically to blast furnaces – will be widened to also include alternative technologies. Even if only 1 or 2 installations with alternative, low-carbon technologies would be covered by the new benchmark definition, it could lead to the benchmark value being increased with the maximum (2,5% per year) instead of the minimum (0,2% per year) rate.

Across all sectors, and at constant activity levels, free allocation volumes for stationary installations are expected to decrease by 37% between 2021 and 2030 (from 566 million allowances in 2021 to 358 million allowances in 2030). A small part of this decrease (-7%) would already happen under the existing Directive, due to an update of benchmark values and the phase-out of free allocation for some smaller sectors which are not deemed to be exposed to carbon leakage. The proposed increase in the benchmark update rate would further reduce allocations with an additional 7%. The bulk of the reduction (22% out of 37%) would come from the phase-out of free allocation following the introduction of CBAM's. Over the whole period, the Commission's proposal would reduce free allocation volumes with an additional 590 million allowances compared to the current Directive.

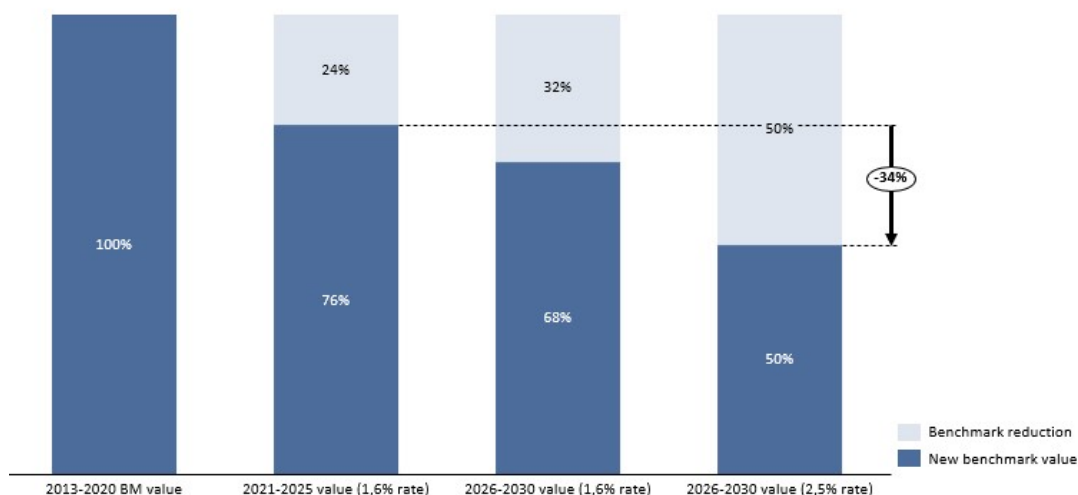
Figure 10: projected free allocation levels under the Commission's proposal (in million EUA's)



The higher benchmark improvement rate will reduce allocations for some sectors by 34% by 2030 compared to 2021

The proposed increase in the maximum improvement rate for benchmarks is expected to have a meaningful impact on the free allocation levels for specific sectors. This is because the increase from 1.6% to 2.5% is multiplied by 20 (the amount of years between 2008 and the middle of the period 2026-2030). Therefore, under the new Commission's proposal, benchmark values for 2026-2030 can be up to 50% lower (20 * 2,5%) compared to 2013-2020, whereas the current Directive would only allow benchmark values to be 32% lower (20 * 1,6%). At constant activity levels, this could reduce allocations for some sectors by 34% compared to the period 2021-2025 (on top of other reductions triggered e.g. by free allocation phase-outs in combination with CBAM's).

Figure 11: benchmark values based on the maximum improvement rate



Assuming GHG intensities will continue to evolve as they have been between 2008 and 2020, this element of the Commission’s proposal will reduce allocations to a number of sectors representing almost 30% of all allocations. The maximum improvement rate would be applied to parts of the steel sector (secondary steel), parts of the ceramics and gypsum sectors, the paper sector, parts of the chemicals sector and all sectors which receive an allocation under the heat and fuel benchmark approach. An improvement rate between 1,6% and 2,5% would be applied to the lime sector. This assessment does not yet take into account the potential impact of a widened definition of the different product benchmarks⁹.

The CSCF is avoided due to the 3% buffer and more ambitious benchmarks

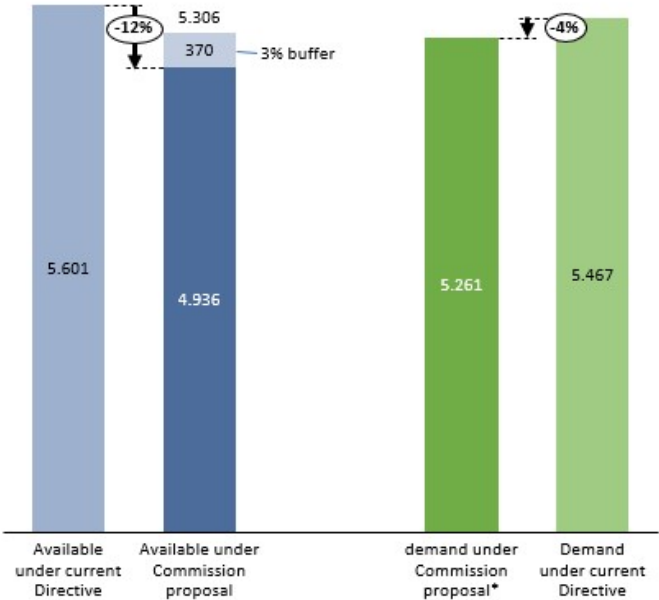
This further tightening of the benchmarks – together with the 3% buffer provided under cap –avoids the triggering of the CSCF, despite a significant reduction of the amount of allowances available for free allocation.

The decrease of the cap is expected to lower the available amount of allowances for free allocation for the entire period 2021-2030 from 5.6 billion under the current Directive, to 4.9 billion under the Commissions proposal (or a decrease of 12%). On the other hand, the higher possible benchmark improvement rate also lowers the demand for free allocation from 5.5 billion allowances to 5.26

⁹ See footnote 8

billion¹⁰ (or a decrease of 4%). Due to this reduction in demand, in combination with the 3% buffer which could contribute up to 325 million allowances to the available amount, the total amount of available allowances (5.3 billion) would be slightly above the demand for free allocation (5.26 billion), and thus no CSCF would be triggered throughout phase 4. However, without the more ambitious benchmarks, demand for free allocations would be almost 200 million allowances above the maximum available amount, causing the CSCF to shave off an additional 31% of free allocations in 2030.

Figure 12: available versus required amount of allowances for free allocation throughout 2021-2030 (in million allowances)



Most sectors will see their free allocation levels reduced between 20% and 50% by 2030 (compared to 2021 levels), with the exception of glass, refineries and mineral wool

The Commission’s proposal would significantly reduce free allocation levels for most sectors by 2030. The impact is expected to be the highest for **the steel, aluminium and cement sector**, which are fully covered by the CBAM proposal and would thus **see their allocations reduced by a little over 50%**

¹⁰ Before taking into account the phase out of free allocation in parallel with the phase in of CBAM’s. This is because under the Commission’s proposal the allowances not allocated due to the introduction of a CBAM will be auctioned under the IF, and therefore can not be used for free allocation for other sectors, and therefore have no impact on the CSCF.

(50% due to the phase-out + some additional reductions through tighter benchmarks¹¹), provided that the CBAM proposal is also fully implemented.

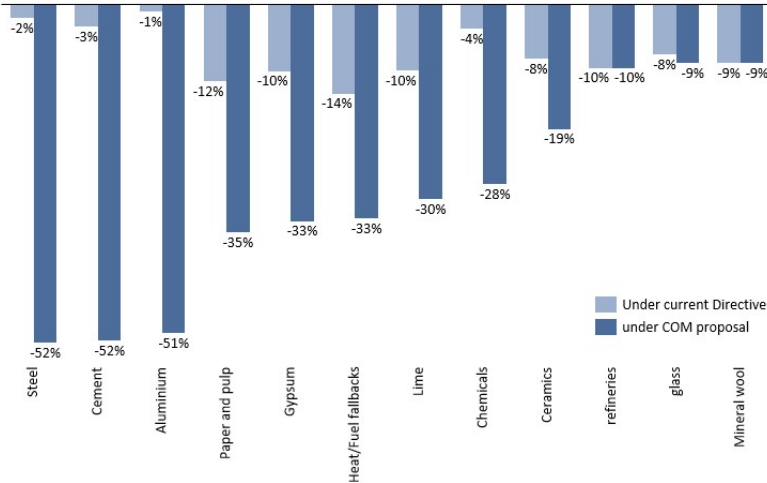
The higher benchmark improvement rate would also have a large impact on the **paper and pulp, gypsum, and lime sector** as well as on the sectors who receive an allocation under **the heat or fuel benchmarks** (the ‘fallback’ approach). These sectors would see their allocation **reduced between 30 and 35%**, depending on their respective carbon leakage status.

Overall, the **chemicals sector would see its free allocation reduced by 28%**. The picture is mixed between the different sub-sectors: fertilizer producers (which include ammonium and nitric acid producers) would also see a strong reduction of at least 50% (even 67% for nitric acid producers, which are also impacted by the higher benchmark improvement rate). Other sub-sectors – including hydrogen, adipic acid and carbon black producers – would see a decrease between -30% to -35% as they are impacted by the higher benchmark improvement rate. Finally, allocation is expected to decrease only limited (less than 10%) for some other major sub-sectors such as steam crackers and aromatics producers.

The expected reduction is less pronounced for the **ceramics sector (-19%)** although here the picture is also mixed: pavers and bricks producers see a deeper decline (-34%), whereas rooftile producers would only see a modest reduction (-7%).

Finally, the **refineries, glass and mineral wool** sector would see their free allocations decline with +10%, which is a modest reduction in comparison with the other sectors, as they are impacted by neither the CBAM proposal nor by the higher benchmark improvement rate.

Figure 13: expected decrease in free allocations per sector (2030 compared to 2021)



¹¹ Before taking into account wider benchmark definitions, this could reduce free allocations even further. See also footnote 8.

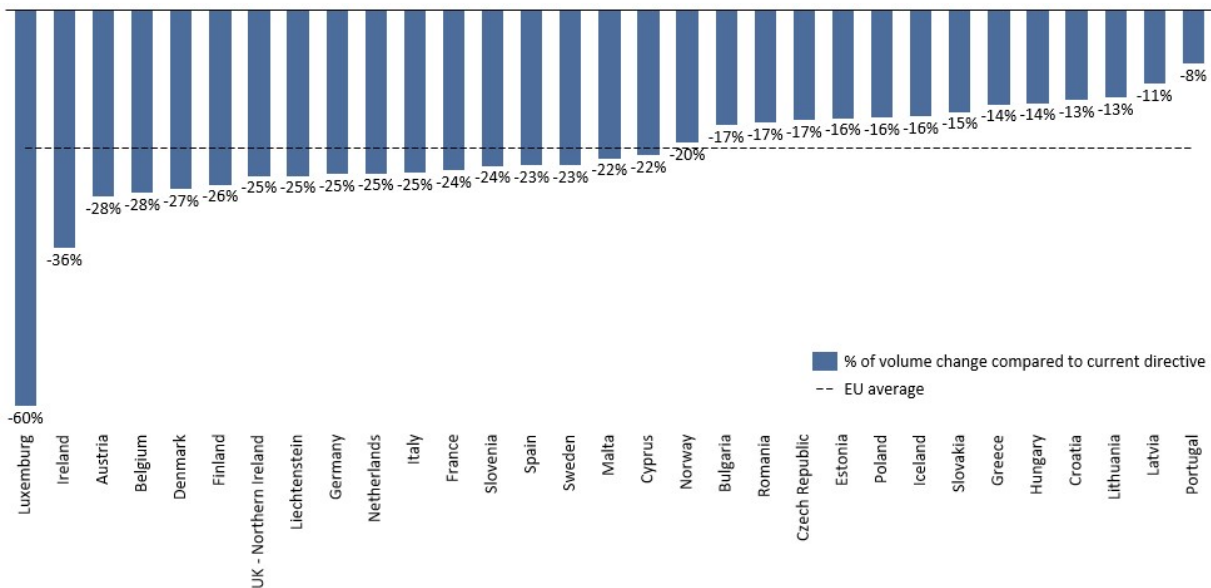
EXPECTED IMPACT ON AUCTIONING VOLUMES

Auctioning volumes will decrease on average with -21%, but the impact is higher for high-income member states (-25%) compared to lower-income member states (-17%)

Over the entire period 2021-2030, the total number of allowances which are auctioned for member states (including the Modernisation Fund, for which member states are the beneficiaries) is expected to be reduced from almost 6 billion allowances under the current Directive, to 4,7 billion allowances (-21%) under the Commission’s proposal. All member states will see their auctioning volumes reduced, but the impact is larger for higher income member states compared to lower income member states. This is because lower-income member states benefit from the extension of (and thus higher auctioning volumes under) the Modernisation Fund. Higher income member states would on average see their auctioning volumes reduced by 25% (with Ireland and Luxemburg outliers because they make larger use of the one-off flexibility with the Effort Sharing Regulation. Iceland on the other hand would expect a much lower impact as lower volumes for stationary installations are largely compensated by higher auctioning volumes for aviation). For lower income member states, the impact is lower at on average -17%.

Of course, whereas the auctioning volumes are expected to decrease, it is also expected that the proposal will cause (or already has caused) an increase in the carbon price, which means that the impact on actual auctioning revenues could even be positive. In that context, it should be noted that the carbon price has more than tripled since the beginning of 2021, and that many experts attribute this increase to the market anticipating the ETS revision. This price increase largely exceeds the expected decline in auctioning volumes.

Figure 14: expected decrease in auctioning volumes per member state (including auctions via the Modernisation Fund)



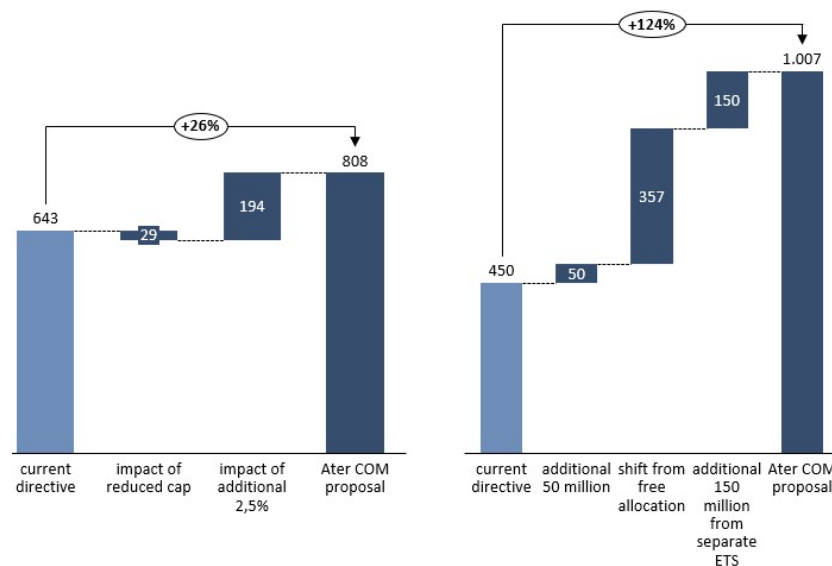
The biggest winners are the Modernisation Fund and the Innovation Fund, which see their volumes increase with +26% and +124% respectively

Whereas all member states will see a decline in auctioning volumes, the auctioning volumes under the Modernisation Fund and the Innovation Fund are expected to grow significantly.

Under the current Directive, the Modernisation Fund would auction a little over 640 million allowances in the period 2021-2030 (the original 276 million based on 2% of the cap + 367 million additional allowances that member states have transferred from their national auctioning volumes). The cap reduction would reduce the original size by 30 million allowances. However, this is largely offset by the proposal to shift an additional 2,5% of the cap (for the years after entry into force of the new Directive) to the Modernisation Fund. The **net impact would be an increase of the Modernisation Fund with 165 million allowances or +26%**.

The increase would be even bigger for the Innovation Fund. First of all, the Commission proposes to add an additional 50 million allowances from the ETS cap (of which 35 million from the free allocation pot and 15 million from the auctioning pot) to the system. An additional 150 million is added from the newly proposed system for road transport and buildings. However, the bulk of the increase would come from the proposed phase-out of free allocation for sectors that would be covered by a CBAM. This phase-out is expected to free up almost 360 million allowances, which will be auctioned under the Innovation Fund to finance Contracts for Difference. As a result, the **total amount of allowances auctioned under the Innovation Fund will increase by 124% to more than 1 billion allowances**.

Figure 15: expected increase in the auctioning volumes under the Modernisation Fund (left) and the Innovation Fund (right) (in million allowances)



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