How can the EU Emissions Trading System support a union-wide coal phase-out?

June 2021

This policy paper complements the briefing "A New Hope - recommendations for the EU Emissions Trading System review"

Introduction:

The EU Emissions Trading System (EU ETS) has been hampered by a historical oversupply since its inception. Since 2019, some of the excess allowances are being absorbed by the Market Stability Reserve (MSR), and a portion of the absorbed allowances is being cancelled.

With announced coal phase-outs around Europe, the impact of the COVID pandemic, and the very rapid reduction in coal power generation currently taking place, the EU ETS is at risk of seeing its oversupply grow once more.

To address this problem, the upcoming ETS revision should both tighten the cap, and strengthen the MSR.

Key recommendations:

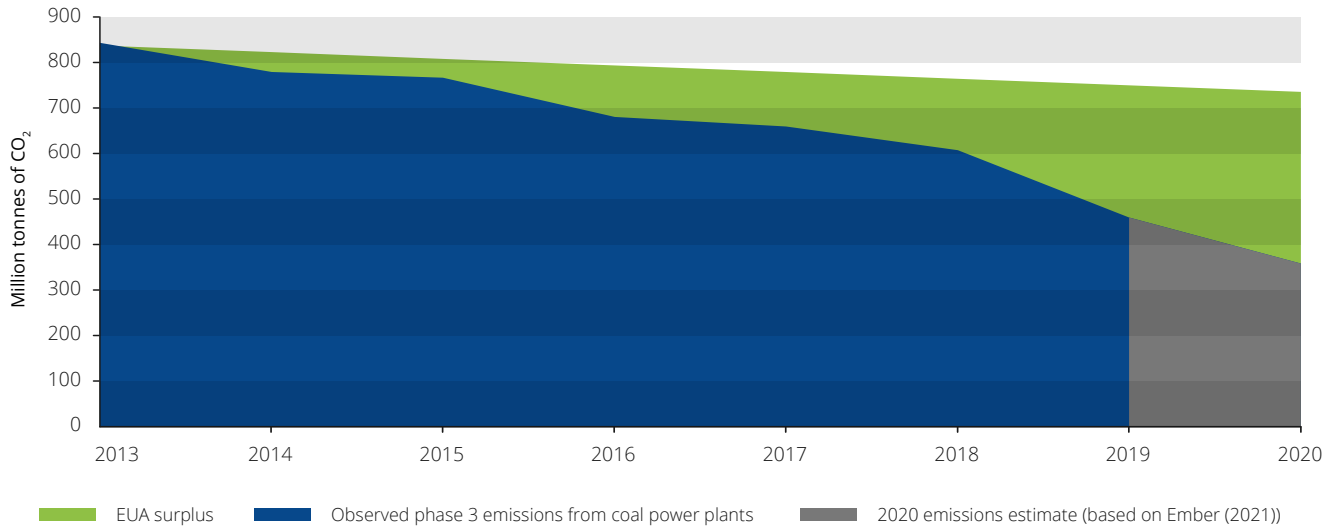
- Apply a one-off reduction of 450 million allowances to the EU ETS cap
- Increase the linear reduction factor to 3.1%, starting in 2023
- Increase the MSR intake rate to 36%
- Cancel all allowances which have been held in the MSR for more than 3 years
- Ensure the MSR thresholds decline to zero by 2030

Preventing a new oversupply from coal phase-outs

In 2020, there were 1.58 billion excess permits on the market,[1] down from 2.1 billion in 2014. This oversupply had accumulated since the beginning of the EU ETS as the allocation of allowances exceeded total emissions. It was further aggravated by the possibility to use international credits as a substitute to surrendering EUAs (no longer allowed since the beginning of 2021).

The "fast" rate of decarbonisation of the power sector, relative to the cap decrease, leads to extra allowances from the power sector which can be used to cover emissions in other sectors. In some cases, such as with the ongoing coal phase-out in many European countries, this creates an accumulation of allowances that is larger than what can be managed by the existing volume control mechanism - the Market Stability Reserve. Between 2013-2019, emissions from coal-based power generation fell by 40%.[2] Over the same period, the cap decreased by 10.5%. In 2020, coal power generation fell 22% compared to 2019.[3] This resulted in a surplus of about 1.1 billion EUAs over phase 3 (2013-2020).[4] Some of this has been absorbed by the industry and aviation sectors, which have been net buyers.

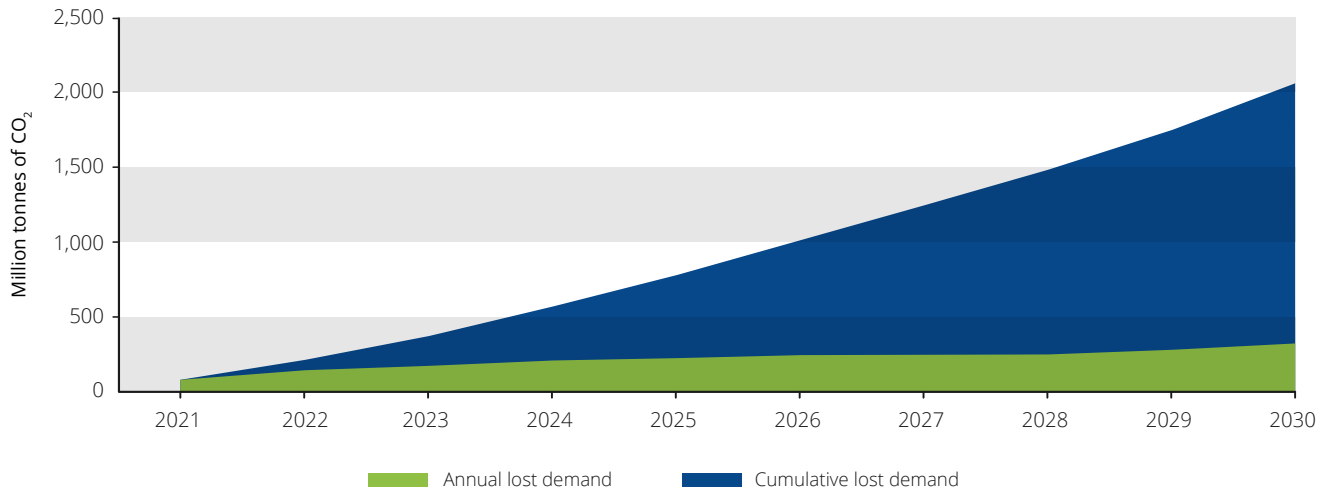
EUA surplus from coal phase-out, 2013-2020



While this is how a market-based system is supposed to function, i.e. some sectors which can decarbonise faster than others will be able to sell their excess allowances, the size and speed of this decarbonisation raises concerns. For instance, the progress in the power sector will have contributed to allowing the industry sector to barely reduce its emissions over phase 3 in part due to low price incentives to do so.

The problem of the EU ETS market in oversupply is not going to be resolved during phase 4, on the contrary. Based on existing coal phase-out plans, Carbon Market Watch estimates emission reductions of 2.07 billion tCO2e over the 2021-2030 period, see the graph below. This means that, if all coal power plants scheduled to be taken offline by 2030 or earlier are replaced by renewables, which should be the EU's objective, a significant number of allowances will add to the current surplus. Some of this will be absorbed by the Market Stability Reserve.

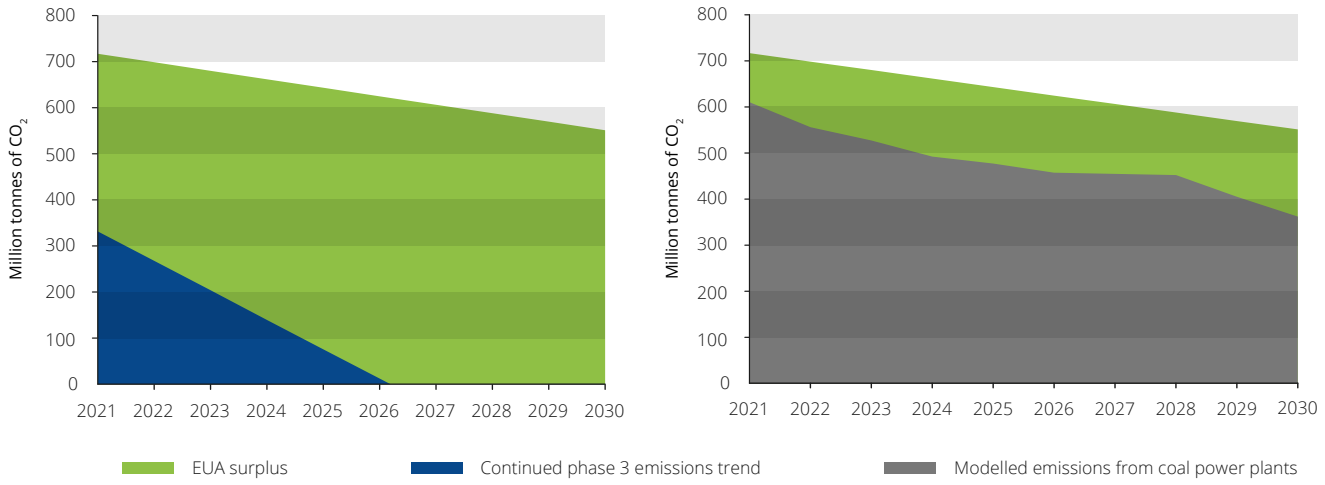
Emission reductions as a result of planned coal phase-out



If the cap is not adapted for phase 4, new surplus will accumulate over 2021-2030. Based on announced coal phase-out plans, 1.55 billion EUAs would accumulate over that period. However, if instead the current emissions trend in the coal power sector continues, the surplus would reach 5.31 billion EUAs, more than three years worth of total EU ETS emissions.

This is shown on the graphs below. The difference in starting point between the two scenarios is due to the fact that scenario one starts at the observed level of emissions in 2021, while scenario two starts at the level of politically mandated coal phase-outs. Given that the EU ETS has pushed coal out faster than what political targets were requiring, and that the Covid-19 crisis lowered emissions in 2020, the scenario 1 starting point is lower.

Comparing two scenarios for coal emissions 2021-2030



The ongoing coal phase-out will likely generate a large surplus of allowances which will need to be addressed by lowering the cap and strengthening the MSR.

Calibrating the Market Stability Reserve

The Market Stability Reserve (MSR) is a mechanism to limit the availability of allowances on the market, and permanently cancel some of them. Under the MSR's current parameters, each year, if the total number of allowances in circulation (TNAC) is greater than 833 million, 24% of the TNAC will be placed in the reserve. From 2024, this share is set to decrease to 12%. If, on the contrary, TNAC is lower than 400 million, 100 million EUAs will be released from the MSR. Finally, each year starting in 2023, if there are more allowances in the MSR than what has been auctioned in the previous year, the difference will be invalidated from the MSR.

The MSR can thus permanently reduce the total - or cumulative - quantity of allowances that will ever be available in the EU ETS. This creates an expectation of scarcity, which can lead to price increases today. This has likely been a significant factor in increasing EUA prices since 2018.

The MSR as it currently exists risks being unfit to deal with a large surplus of allowances over the coming years. It could further be affected by economic shocks which would reduce production and hence emissions across the EU,[5] as was the case with the coronavirus crisis.

Therefore, reviewing the MSR's key parameters is imperative in order to increase the resiliency of the EU ETS and maintain its environmental integrity. These key parameters include: the rate at which allowances are absorbed by the MSR ("intake rate"), the upper and lower thresholds in between which the MSR stops functioning, and the triggers for permanent cancellation of EUAs. Given that the surplus is unlikely to cross the lower threshold of the MSR during phase 4, the quantity of allowances released when this happens is not a very significant parameter, and barely affects the total quantity of allowances cancelled overall.[6]

The MSR's functioning depends on various parameters, which interact with each other as well as with EU ETS-wide parameters such as the Linear Reduction Factor (LRF, the pace at which emissions are reduced annually). Therefore, several studies make the case for a

simplification of the system, e.g. by replacing the existing "volume" thresholds with "price thresholds''. This would turn the MSR into a hybrid instrument which controls supply based on the EUA prices.[7] Beyond reviewing the MSR's existing parameters as described below, in theory such a price-based revision of the MSR's functioning could simplify the system. In practice however, the implementation of this idea into EU policy making historically has been considered fraught with design challenges and implementation hurdles.[8]

A higher intake rate will increase the quantity of allowances absorbed by the MSR, in years when TNAC is above the upper threshold. A 12% intake rate starting in 2024 (as currently planned) would lead to a cancellation of 3.3 billion allowances over phase 4 (slightly more than 2-years worth of EU ETS emissions). Increasing this rate to 24% or 36%, again from 2024, would lead to a cancellation of 4 billion or 4.4 billion allowances respectively over phase 4.[9]

However, the intake rate should not be considered in isolation from the thresholds. Increasing the intake rate alone could have very little impact over the long term if the thresholds are not adapted. This is because a higher intake rate will logically lead to a lower surplus (since more allowances are absorbed), which means that there will be more years in which the TNAC will be below the MSR's upper threshold, and hence the MSR will not absorb any allowances. There is therefore a trade-off between absorbing more allowances over fewer years, or absorbing fewer allowances over more years. This relationship also means that a higher intake rate can increase instability of the market, because it will bring the TNAC more often in close proximity to the threshold, where companies have an incentive to exert market power. For example, speculators could buy more allowances to maintain the surplus above the upper threshold, thereby forcing the MSR to continue absorbing EUAs, which will drive prices up and hence increase profit for those investors.[10] Lowering the MSR thresholds is therefore particularly important when the intake rate is increased.

In addition, the main reason for setting the upper threshold at 833 million allowances was to allow power sector installations to "hedge" their EUA needs, i.e. buy allowances in advance to make sure that they will be able to cover their emissions from generating power as specified in long-term power purchase agreements. However, since the power sector is decarbonising very fast, the hedging requirements are decreasing. The thresholds should therefore be lowered to account for this and decline to zero by 2030.

Finally, it is important to also consider the triggers which lead to the permanent invalidation of allowances held in the MSR. If there are more allowances in the MSR than the quantity auctioned in the previous year, the difference will be invalidated. This is the key mechanism driving up EUA prices. As allowances issued in a given year are supposed to represent the emissions that can be released in that year, there is no reason to accumulate a large supply of extra allowances in the MSR. This would simply hold back the system by maintaining the constant threat of new supply. Therefore, a new rule should be adopted to automatically cancel allowances which are held in the MSR for more than 3 years.

Interaction between the linear reduction factor and the market stability reserve

There is a highly complex interaction between the MSR's cancellation rules, companies' behaviour and valuation of the future, and the LRF. In practice, this makes it impossible to set the MSR parameters and the LRF in a way that ensures a given total level of emissions.

First, there is an important interaction between the MSR and LRF, as the latter can reinforce the former to reduce total emissions.[11] This happens in two ways. First, since the LRF reduces the quantity of allowances auctioned, it increases the quantity of allowances cancelled in the MSR (since the quantity cancelled is the difference between auctioned volume and volume in the MSR). Second, a higher LRF will lead to higher prices - because of anticipated higher scarcity in the long term - but will only marginally affect supply in the short term. The higher prices will drive reductions, which will increase the surplus and hence increase the quantity of allowances absorbed. The exact impact of this strongly depends on how companies and investors will react to the changed LRF, including how much effort they are willing to exert today in order to save allowances for tomorrow (their "intertemporal discount rate").

Finally, the MSR operates in a way in which it could create a "green paradox".[12] Taking the example of coal phase-outs, when these are announced a long time in advance, which is typically the case, e.g. in Germany, they could lead to both an increase in emissions today and a reduction in the MSR's effectiveness. This is because the announcement creates an expectation of surplus

in the future (compared to a world without this announcement), which means that companies will be less worried about the future and more inclined to use their allowances today. This will increase emissions, and reduce today's surplus which in turn reduces the MSR' effectiveness.[13] However, it again largely depends on companies' short-term adaptation to expected long-term changes, including their flexibility with regards to the increase or decrease of emissions in any given year.

Conclusions

The EU ETS is currently not fit for purpose as the rapid ongoing coal phase-out is threatening to create a new surplus of allowances. While the MSR has sent some useful signals to increase prices to date, it will not be sufficient to absorb all extra allowances from closed power plants and the impact of the COVID pandemic. It should therefore be reviewed.

Mirroring the need to increase the overall ambition of the EU ETS to reach climate neutrality by 2040, in line with Europe's fair share of global action, the EU ETS cap must be lowered, both through a one-off reduction, and through the adoption of a higher linear reduction factor. In addition, the MSR's intake rate should be increased to 36%. The MSR thresholds should be lowered, and sink towards zero by 2030. Finally, allowances held in the MSR for more than 3 years should be automatically cancelled.

Suggested amendments to the EU Emissions Trading System Directive 2003/87/EC (consolidated version):

- **Add: Article 9, paragraph 3(new)** - *"one-off reduction of the cap and LRF increase for the ETS cap to reach -70% by 2030: The Union-wide quantity of allowances issued each year starting in 2023 shall decrease by a one-off reduction of 450 million. Starting in 2023, the linear factor shall be 3.1%".*

Suggested amendments to the Market Stability Reserve Decision (EU) 2015/1814 (consolidated version):

- **Amend article 1 - paragraph 5:** *"Each year, a number of allowances equal to 1236% of the total number of allowances in circulation [...] shall be deducted from the volume of allowances to be auctioned by the Member States [...] and shall be placed in the reserve [...], unless the number of allowances to be placed in the reserve would be less than 100 million.* ***Between 2021 and 2030 this threshold of 100 million allowances shall linearly decrease to zero."***
- **Add: Article 1 - paragraph 5b(new):** *"From 2023 allowances held in the reserve for a duration longer than 3 years shall no longer be valid".*
- **Amend article 1 - paragraph 6:** *"In any year, if the total number of allowances in circulation is equal or less than 400 million, 100 million allowances shall be released from the reserve [...].* ***Between 2021 and 2030 this threshold of 400 million allowances shall linearly decrease to zero.***"

References

1 European Commission (2021): "Publication of the total number of allowances in circulation in 2020 for the purposes of the Market Stability Reserve under the EU Emissions Trading System established by Directive 2003/87/EC"

2 All quantitative estimates in this section of the paper are based on data prepared by Alessandro Vitelli, using data from the "EU beyond coal" campaign. Post-2020, when no plant-specific closure date is publicly available, closures were modelled by plant age so that the oldest plants retire first.

3 Ember and Agora Energiewende (2021): "EU power sector 2020"

4 Surplus = observed emissions from coal power plants - cap. 2020 emissions are assumed to have sunk in proportion to the decrease in generation, i.e. 22% compared to 2019. The cap is modelled as if it applied only to coal, in order to estimate the surplus for the coal power sector. To model this "coal-only" cap, the relevant rules from the ETS regulation were adapted to the coal power sector, i.e. a linear reduction factor of 1.74% for the period 2013-2020 is applied based on the average of 2008-2012 emissions for the coal power sector only.

5 Graichen (2019): "Indicators to inform the MSR review", workshop presentation

6 Osorio, Sebastian; Tietjen, Oliver; Pahle, Michael; Pietzcker, Robert; Edenhofer, Ottmar (2020) : "Reviewing the Market Stability Reserve in light of more ambitious EU ETS emission targets", ZBW – Leibniz Information Centre for Economics, Kiel, Hamburg

7 See for example Bruninx et al. (2019) "The unintended consequences of the EU ETS cancellation policy" or Osorio et al. (2020) referenced above

8 https://ec.europa.eu/clima/sites/default/files/ets/reform/docs/com_2012_652_en.pdf

9 Oeko Institut (2019): "The role of the EU ETS in increasing climate ambition"

10 Osorio, Sebastian; Tietjen, Oliver; Pahle, Michael; Pietzcker, Robert; Edenhofer, Ottmar (2020) : "Reviewing the Market Stability Reserve in light of more ambitious EU ETS emission targets", ZBW – Leibniz Information Centre for Economics, Kiel, Hamburg

11 Ibid.

12 Rosendahl (2019): "EU ETS and the waterbed effect" Nature Climate Change

13 Gerlagh et al. (2019): "Endogenous Emission Caps Always Induce a Green Paradox", cesIFO working papers; Bruninx et al. (2019) "The unintended consequences of the EU ETS cancellation policy"

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This project action has received funding from the European Commission through a LIFE grant. The content of this section reflects only the author's view. The Commission is not responsible for any use that may be made of the information it contains.

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