

The Market Stability Reserve: Assessing Reform Needs and Possible Impacts on the EU ETS

Lead Author: *Sylvain Cail (Enerdata)*

Authoring team: *Matthieu Jalard and Emilie Alberola (I4CE - Institute for Climate Economics / Climate KIC / KIC Inno Energy)*

Reviewers: *Paul Deane (University College Cork), Robert Beestermöeller (University of Stuttgart)*

Legal Notice: Responsibility for the information and views set out in this paper lies entirely with the authors.

This Hot Energy Topic assesses the European Emissions Trading System (EU ETS)'s reform with the introduction of the Market Stability Reserve (MSR) as of 2019. This new reserve mechanism has a number of aims; namely to restore the EU ETS short-term scarcity by absorbing the surplus of allowances, to build resilience to supply-demand imbalances and also to enhance synergies with other climate and energy policies.

A growing surplus undermining the EU ETS effectiveness

The EU ETS is on track to achieve its 2020 emissions target, namely a 21% reduction compared to 2005 levels. EU ETS CO₂ emissions have decreased by 14.5% (EUTL, 2015) since the beginning of phase II (2008-2014), and by 19% when taking into account the introduction of new greenhouse gases (nitrous oxide and perfluorocarbons) and sectors (aluminium and part of the chemical industry) in 2013.

The decrease in CO₂ emissions has been particularly sharp in the power sector (-20.5%) due to the economic downturn, strong progress in terms of energy efficiency, and the uptake of renewable energy sources (RES) accounting for 32% of the EU ETS power in 2014 (ENTSO-E, 2015). In the period 2005 to 2011, I4CE (2013) estimated that more than 1 GtCO₂ has been removed in the EU ETS compared to a counterfactual scenario.

Complementary energy and climate policies are reducing emissions under the umbrella of the cap, and contribute to the building up of

an increasing surplus if the emissions cap is not adjusted accordingly. Abatements linked to the Energy Efficiency Directive enforced after the definition of the EU ETS cap are estimated to amount to roughly 500 MtCO_{2e} over Phase III and the cumulative inflow of international credits will amount to 1.6 GtCO_{2e} in Phase III. A large share of abatements stem from the RES directive as outlined in Figure 1, but was considered when the cap was set in 2008. Only the overachievement of the 2020 target to generate 34% of EU 28 power with RES is expected to lead to more abatement compared to what was considered in the emissions cap and to contribute to the surplus by an estimated 120 MtCO_{2e} in Phase III.

As a consequence of the decrease of CO₂ emissions, and in the context of an inflexible emissions cap, a large surplus has been building up in the EU ETS without any perspective of decreasing before 2030, amounting to 2.1 GtCO₂ in 2014. This is expected to achieve 2.6 GtCO₂ in 2020 and more than 3.0 GtCO₂ in 2030.

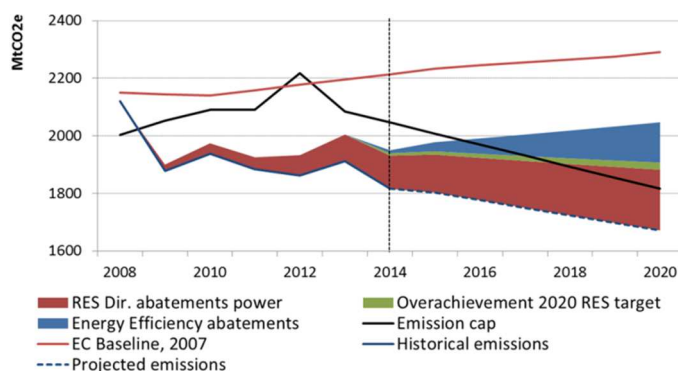


Figure 1: Baseline, cap and emissions in the EU ETS Phases II and III (Source: Institute for Climate Economics – I4CE, estimations based on European Commission data 2015).

This short-term surplus, combined with the myopia of market participants and low confidence in the long-term decarbonisation target, has led to a fall in prices from €15/tCO₂e in 2011, to a price range of €3-8/tCO₂e in the 2013-2015 period which removes firms’ incentives to invest in low-carbon technologies.

MSR effectiveness and evolution of surplus

The legislative proposal for the MSR, disclosed in January 2014, was approved by the EU Parliament on 7th July 2015 with some substantial changes from its initial version. The final parameters detail the following: withdrawal and reinjection thresholds of 833 and 400 MtCO₂e, a start date in 2019, the reintroduction of 900 million backloaded allowances and unallocated allowances in Phase III into the MSR, provisions for the monitoring of the MSR which includes two reviews in Phase IV, and an increased reactivity of the mechanism compared to the two years’ time lag initially proposed. The decision was adopted by the EU Council on 18th September 2015.

The MSR was designed to address the lack of flexibility in the supply side and the short-sightedness of market participants. As shown in Figures 2 and 3, without the implementation of the MSR, the estimated surplus could increase to 3 GtCO₂ by 2020. With the implementation of the MSR from 2019 and the

return of backloaded allowances to the reserve, the EUA surplus could be limited to 2 GtCO₂ in 2020 and decrease gradually from 2021 to 2030 to 500 MtCO₂. As such, the MSR will likely help to restore the short-term scarcity needed during Phase IV of the EU ETS, enabling market participants to take into consideration the long-term stringency of climate policies. It will also help increase resilience to external shocks (I4CE and Enerdata, 2015).

As a result, the MSR reinforces the robustness of the EU ETS, which ensures better price consistency, and provides a more credible framework for investment in low-carbon technology development and deployment.

The MSR is likely to enhance the dynamic efficiency of the EU ETS, and is a positive step towards achieving emission reductions at the least cost in the long run. However, dynamic modelling results (CEC, 2014) underline the difficulties in forecasting the impact of the MSR on the banking behaviour of operators and EUA prices. Inadequate withdrawal and reinjection thresholds, not in line with hedging needs, are likely to spur volatility and can have detrimental consequences on the low-carbon investment framework. Given the wide range of uncertainties, an appropriate governance of the MSR will be essential to ensure its efficiency by recalibrating parameters to avoid important deviations from an efficient decarbonisation pathway.

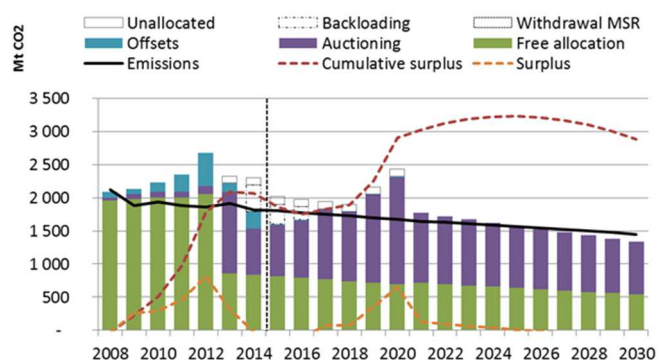


Figure 2: The surplus of allowances without MSR in the EU ETS (Source: Institute for Climate Economics – I4CE, based on data from EC, EU TL, 2015).

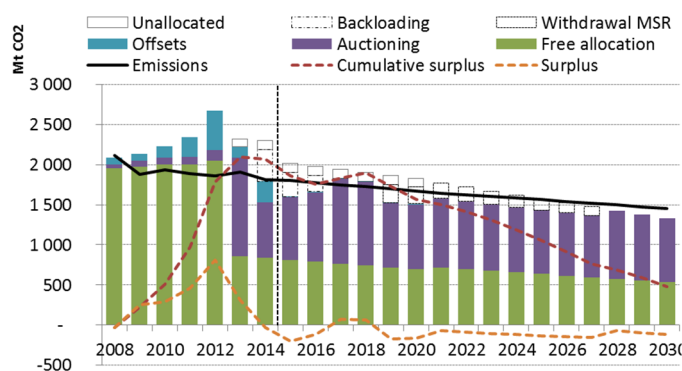


Figure 3: Impact of the MSR implementation on allowances surplus in the EU ETS (Source: Institute for Climate Economics – I4CE, based on data from EC, EU TL, 2015).

Possible consequences of the MSR on the EU ETS

Based on the analysis performed above, the possible consequences of the ETS reform with the introduction of the MSR as of 2019 are assessed. To this end, two comparative scenarios (with and without the MSR) are calculated with the POLES¹ model. This section focuses on the projected price of allowances, on the reductions performed in the different ETS sectors and the associated sectoral abatement costs.

Most existing analysis on the potential impact of the MSR were performed before the adoption of the reform by the EU Council in September 2015 and therefore account for an introduction of the mechanism from 2021 as initially planned.

The present assessment is performed with the assumption of an introduction of the MSR as of 2019. Up until 2018, the level of allowances surplus follows a single path, as described in the previous section. From 2019 onwards, two cases are considered, depending on the implementation or not of the MSR:

- **Reference:** the level of surplus is increasing until 2021 and remains relatively stable until 2030 (above 2 GtCO₂, in line with the reference case from the European Commission’s Impact Assessment (EC, 2014) which is comparable to Figure 2);
- **MSR:** the Market Stability Reserve is introduced from 2019, leading up to a declining level of surplus reaching about 500 MtCO₂ in 2030 (following the evolution profile described in Figure 3).

The level of available allowances surplus will obviously impact the amount of surplus credits used from market participants to comply with their respective targets. As a consequence, the effective reduction cap – i.e. net of surplus utilization – of the EU ETS until 2030 will be reduced accordingly and the necessary carbon price incentive in the market to reach this yearly level of emissions reduction is observed in the following. The introduction of the MSR, and therefore the reduced availability of surplus allowances, leads to a sharper increase of the EUA price (Figure 4). The difference observed is increasing over time and reaches €15/tCO₂ at the end of Phase IV². Such an impact is relatively in line with other existing studies, even though based on an introduction of the mechanism from 2021. As an example, Point Carbon (2014) estimates a rise in carbon price of €11/tCO₂ in 2028, induced from the MSR, whereas CEC (2014) mentions a €26/tCO₂ increase, compared to €13.2/tCO₂ in the present analysis for the same year.

¹ POLES (Prospective Outlook on Long-term Energy Systems) is a world energy-economy partial equilibrium simulation model of the energy sector developed jointly by Enerdata, EDDEN-CNRS and the EC-JRC IPTS.

² In this section, all prices are given in €₂₀₁₀. Possible differences with other studies like (EC, 2014) in the absolute levels of CO₂ price may be explained by the different modelling approaches and assumptions regarding e.g. incentives considered for energy efficiency and renewable energy sources.

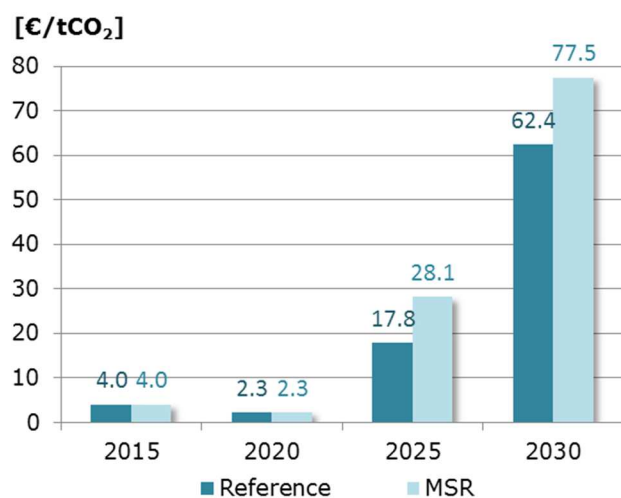


Figure 4: Impact of the MSR on EUA price (source: POLES-Enerdata model, 2015).

For an in-depth understanding of the economic consequences that the introduction of the MSR could have in the different EU ETS sectors, a model coupling is performed between the POLES model and the Carbon Market Tool which is a dedicated software for the analysis of carbon markets worldwide. As a result, Table 1 provides an overview of the consequences of the MSR in terms of the additional abatement costs³ that can potentially accumulate over the period 2015-2030, resulting in the ETS individual sectors from the reform.

Approximately two thirds of additional abatement costs could be supported by the power sector, offering the highest flexibility in terms of the emissions reduction potential derived from relatively low average reduction costs (€39 per ton of CO₂ avoided). To a lesser extent, industrial sectors, and in particular the sector of mineral products, contribute significantly to the additional reduction effort required. For the EU ETS as a whole, total additional abatement costs amount to €1.7bn cumulated over the whole period 2015-2030. These results would probably be amplified in reality by the potential continuation of free allocations for industrial sectors which are

³ The combined use of POLES and Carbon Market Tool allows to derive the cumulative sector-specific abatement costs presented here that are necessary to perform a given emissions reduction profile over time.

subject to carbon leakage over Phase IV; possible options for a system to avoid carbon leakage are not accounted for in the present modelling work.

In addition to abatement costs due to emission reductions, the EU ETS may be subject to an additional cumulated investment reaching €21bn over 2015-2030, induced by the introduction of the MSR. The electricity sector is estimated to contribute to about 66% of this investment in new generation capacities, whereas 34% would be invested in final demand sectors (e.g. industry and households). Further, the final average price of electricity paid by end users in 2030 may be 2% higher compared to the case without the market stability reserve.

Within the EU ETS, the electricity generation sector could increase its permits sales onto the market by 18 MtCO₂, allowed by the additional domestic reductions achieved. To a much lesser degree, the aviation sectors' international bunkers offer flexibility to increase their emission reduction efforts and become a net permit exporter in comparison to the case without the MSR. On the demand side of the EU ETS, industrial sectors may increase their sourcing on the market by about 16 MtCO₂. In particular, the sectors mineral products as well as upstream and refining would be responsible for this trend.

In conclusion, the market stability reserve induces additional emissions reduction from market participants in the EU ETS, in particular from the electricity generation sector. From an economic point of view, the price of allowances could be increased by about 24% in 2030 in comparison to a case without the implementation of the reform, with first effects being perceived between 2020 and 2025.

Sector	Δ abatement costs [€m] (cumulative 2015-2030)	Share of total [%]	Average cost per tCO ₂ avoided [€/tCO ₂]
Industry	403	23.6%	46
Chemicals	48	2.8%	41
Manufacturing	30	1.7%	38
Mineral Production	178	10.4%	46
Steel	76	4.5%	71
Upstream and Refining	71	4.2%	38
Power	1,129	66.0%	39
Buildings	22	1.3%	16
Residential	15	0.8%	30
Services	7	0.4%	8
Air Transport	153	8.9%	43
Domestic	22	1.3%	43
International	131	7.7%	44
Agriculture	4	0.2%	28
Total EU ETS	1,711	100%	40

Table 1: Impact of the MSR on 2015-2030 cumulative abatement costs in the EU ETS (source: POLES-Enerdata model and Carbon Market Tool, 2015).

Conclusion

The MSR is a highly welcome reform for the EU ETS as it is expected to gradually absorb the current surplus and improve resilience to exogenous shocks. This mechanism will clearly help overcome market imperfections linked mainly to the short-sightedness of market participants. Therefore, it will help drive the price trajectories closer to more efficient ones to achieve long-term targets at a lower cost. Indeed, from 2019 the MSR may lead to an increase in the CO₂ price by roughly €₂₀₁₀15/tCO₂ by 2030 compared to a case without the reform. Additional reductions will be performed and the corresponding abatement costs will be supported mainly by the power sector.

However, the major drawback of the mechanism lies in its inability to discriminate

between surplus stemming from abatement efforts and surplus stemming from exogenous shocks. Such a “robot-like” withdrawal of surplus is likely to spur volatility if not adjusted to hedging needs and can have detrimental consequences on the low-carbon investment framework. Given the likely and unforeseeable evolution of business models and hedging needs in the power sector, some degree of “human intervention” could be essential to recalibrate the MSR in a timely fashion and to safeguard the dynamic efficiency. Some stakeholders have called for a committee of experts to assess the state of the EU ETS before formulating recommendations to adapt the design of the MSR accordingly.

References

CEC, 2014: *EU ETS reform in the Climate-Energy Package 2030: First lessons from the ZEPHYR model*, Climate Economics Chair (January 2014).

EC, 2014: *Impact assessment, Accompanying the Proposal for a Decision of the European Parliament and of the Council concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and amending Directive 2003/87/EC* (January 2014).
http://ec.europa.eu/clima/policies/ets/reform/docs/swd_2014_17_en.pdf

ENTSO-E, 2015: *Online Production Data*, European Network of Transmission System Operators for Electricity.

EUTL, 2015: *European Union Transaction Log*.

I4CE – Institute for Climate Economics, 2013: *Assessing the factors behind CO2 emissions changes over the phases 1 and 2 of the EU ETS: an econometric analysis* (October 2013).

I4CE – Institute for Climate Economics and Enerdata, 2015: *Assessing the European Commission's proposal to revise the EU ETS Directive by 2030* (forthcoming).

Point Carbon, 2014: *The MSR: Impact on balance and prices*, CEPS Task Force – EU ETS Market Stability Reserve (April 2014).

For further reading or information, please visit www.insightenergy.org