MSR not calibrated to cope with huge additional surplus from ambitious energy policy

20 February 2018

TO THE POINT

- The European Parliament and the Council are about to start trilogue negotiations to decide whether to step up Europe's 2030 ambition on energy efficiency and renewable energy. The Council wants a 27 percent renewable share and 30 percent efficiency improvement. The Parliament wants both targets at 35 percent. We assess the difference between these two positions to translate into a 13 percent reduction of EU ETS emissions in phase 4.
- Designed as an instrument to make the EU ETS market balance more resilient to demand shocks, the Market Stability Reserve (MSR) would respond to the increased oversupply under the Parliament position by absorbing an additional 700 million allowances by 2030 (compared to the Council's ambition level).
- Still, with its current set-up the MSR would fall short of soaking up the additional surplus quickly enough to stabilise the marked, and carbon prices in 2030 would be more than halved compared to under the Council position (11 €/t vs 24 €/t). On average over phase 4, prices are 35 percent lower with the Parliament position compared to the Council position.
- The provision to cancel allowances from the MSR from 2023 onwards does not affect the market balance over phase 4 and we assume no modelled impact on EUA-prices until 2030. However, the long term climate ambition of the system is increased as allowances are permanently wiped out from the system. In a scenario of 27 percent energy efficiency improvement and a target of 30 percent renewable energy, 2.4 billion allowances will be cancelled until 2030.
- This effect becomes even more pronounced in scenarios of increased energy efficiency and renewable energy ambition. Under the Parliament position, an additional 700 million allowances will be cancelled from the MSR. The cancellation provision therefore also functions as a somewhat veiled instrument to counteract the effect of overlapping policies – in the long term.

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INTRODUCTION

The EU ETS reform is a done deal, only Council rubberstamping remains. The carbon market effect of other policies interacting or overlapping with the trading system instrument was an integral part of that debate. The dilemma - in short - is that policies at national or EU level that reduces emissions in the EU ETS sectors will decrease demand for allowances and thereby contribute to a higher surplus. This could potentially distort the supply-demand balance, despite the Market Stability Reserve (MSR) being in place to ensure a balanced market, and put a bearish pressure on carbon prices.

In previous analysis we discussed how overlapping policies could affect the European carbon market and carbon prices towards 2030. Our report What role for coal stipulates carbon price paths under different assumptions and speed of coal phase-out in Europe. The report The German Way: Easier to say yes to renewables than no to coal discusses the carbon price effect of a more ambitious 2030 renewables target for Germany, as adopted by the new government coalition. Both can be found under the "overlapping policy" tab on the Carbon Europe app on Eikon.

The revised ETS directive addresses one specific instance of such overlapping policies. The new legislation allows member states that adopt polices leading to the closure of electricity generation (in reality, coal phase-out policies) to cancel a corresponding volume from their share of the of EUA auctions It is uncertain to what degree member states will make use of this provision to voluntarily cancel auction volumes, as it implies forfeiting auction revenues, and that without the certainty of actually boosting EUA prices.

As the Clean Energy for All-files make their way through the decision making process in Brussels, the discussion on interaction of policies is still very much alive. Policy makers are about to embark on trilogue negotiations where they will decide whether to step up the EU's 2030 ambition on energy efficiency and renewable energy.

This analysis looks at how the EU ETS would respond to increased levels of renewable energy in the power sector and energy efficiency improvements across the sectors covered by the system. We discuss how emissions in the EU ETS sectors could develop under various scenarios of higher penetration of renewables and increased efficiency gains, and how the MSR cope with higher levels of oversupply. Using our carbon price forecasting model, we consider how carbon prices develop in the different scenarios.

A 2030 FRAMEWORK STILL IN THE MAKING

The 2030 climate and energy framework that was adopted by European leaders in October 2014 sets the headline targets for the block as a whole: at least 40 percent reduction in greenhouse gas emissions (from 1990-levels), renewable energy to have a share of at least 27 percent in the final consumed energy mix, and at least 27 percent energy efficiency improvement (compared to projections from 2007). The overall target is to be achieved mainly through the EU ETS (for big stationary installations) and effort sharing (for other more dispersed sources of emissions).

A draft ETS revision was presented in July 2015 and a provisional agreement was reached in trilogue in November 2017. It was endorsed by the European Parliament in a plenary session in early February 2018 and now awaits formal and final approval by the Council. The new effort sharing regulation was agreed in trilogue in December 2017 and now awaits plenary approval (most likely in April 2018). As for renewable energy and energy efficiency, draft legislation was presented in November 2016. The Commission argued that the efficiency target should be increased to 30 percent. Now that the Parliament and the Council have reached their positions on the two files, they will enter into trilogue in late February, and will likely be finalised well before the end of 2018.

In a plenary vote on 17 January, the European Parliament decided to call for renewables to have a share of at least 35 percent in the energy mix in 2030. A strong majority (492) voted in favour, with 88 against and 107 abstentions. That confirmed the position of the Industry and Energy Committee (ITRE) last November, except for the question of binding targets at national level (the plenary decision does not call for it to be binding at national level, only at EU level). The Council decided last December to stick with the 27 percent target proposed by the European Commission in the draft legislation in November 2016. In his comment to the ministers, Climate and Energy Commissioner Cañete stated that the adopted level of ambition was clearly insufficient. He argued that thanks to falling prices for renewables, the EU could reach a target of 30 percent of renewables with similar costs as had been previously estimated for the 27 percent .

> **"The difference between 35 and 27 percent is the difference between ambition and lack of ambition**
>
> *Climate and Energy Commissioner Miguel Arias Cañete*

A report published 19 February by the International Renewable Energy Agency (IRENA), commissioned by the European Commission, argues that the EU could cost-effectively reach a 34 percent renewable share in 2030. Commenting on the report, Cañete stated that "The difference between 35 and 27 percent is the difference between ambition and lack of ambition," saying he is "convinced that the substantial reduction in the costs of renewable technologies plays in our favour."

On energy efficiency the European Parliament adopted a target of minimum 35 percent by 2030, binding on EU level but not on national levels. This was lower than the 40 percent target initially recommended by a narrow majority ITRE committee. However, this downscaling of ambition came as no surprise, since several big political

Table 1: Positions of the co-legislators

	Commission proposal	Council position	Parliament position
Energy efficiency improvement	30%	30%	35%
Renewable energy share	27% (draft proposal in 2016), above 30% implied by statements by Cañete in 2018)	27%	35%

groups had announced unwillingness to support such an ambitious target. In the plenary vote a majority of 485 voted in favour of the 35 percent target, with 132 against and 58 abstentions. The outcome still leaves the Parliament with the more ambitious position ahead of the trilogue negotiation with the Council which wants a 30 percent energy efficiency target. See overview of positions in Table 1.

The two lawmakers will now have to align their positions and reach an agreement in trilogue negotiations. Bulgaria, who took over the rotating EU presidency on 1 January, will try to steer these negotiations through to a conclusion before Austria takes over the presidency on 1 July 2018. The first trilogue meeting on Energy Efficiency will take place on 22 February and the first on Promotion of Energy from Renewable Sources (RES) will be on 27 February.

> **“ The Parliament position enjoys a firm backing from a strong majority of MEPs, whereas the Council is clearly more divided.**

Getting the Council on board for tougher targets will be hard, as Poland has indicated strong opposition to the Parliament's positions, especially on renewables. That said, several member were never happy with they see as too weak targets, and in early February the Swedish government officially backed the 35 percent targets, in other words going against the general approach reached in Council on 18 December 2017. Judging from the alliances observed in the Council discussions on climate and energy over the last years, we might expect Sweden to get support from other member states with pro-climate agendas.

The Parliament position enjoys a firm backing from a strong majority of MEPs, whereas the Council is clearly more divided. In the inter-institutional negotiations this should logically give an advantage to the Parliament, but in the end it will also be a question of how far the pro-climate countries will be willing to push Poland.

One possible compromise might be to keep the renewables target at 27 percent (priority for Poland) but to increase the energy efficiency target to somewhere between 30 and 35 percent. Alternatively, the two institutions could agree to align both targets at 30 percent.

In the following, we'll discuss the four scenarios listed below:

- Scenario 30% EE, 27% RES (Council position)
- Scenario 35% EE, 27% RES
- Scenario 35% EE, 30% RES
- Scenario 35% EE, 35% RES (Parliament position)

The 30EE/27RES-scenario corresponds to the current Council position. The 35EE/27RES-scenario isolates the effect of an increased energy efficiency ambition as adopted by the Parliament, while the remaining two scenarios display the combined effect of increased efficiency with higher shares of renewable energy in the power mix; the latter consistent with the European Parliament position adopted earlier this year.

ENERGY EFFICIENCY AND RENEWABLE ENERGY - GETTING THERE SOONER ANYWAY?

Leaving aside the discussion on what will be the final outcome of the legislative process, it is still possible to imagine a steeper uptake of renewable energy sources and more rapid efficiency improvements even without an increased political ambition in place.

Back in November 2016, the Commission argumentation for raising the energy efficiency target was that that this could be achieved at little incremental costs – and as noted above, the Commissioner uses similar arguments to raise the renewables target beyond 27 percent.

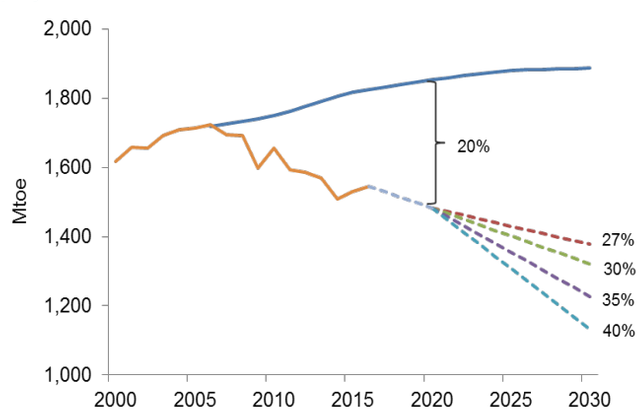
Figure 1 show the historical development of energy demand in Europe, and display the pathways to reach various levels of efficiency improvement in 2030. The overall trend seems clear; over the last decade (until 2016), the European Union reduced its energy consumption by 210 mtoe. This saving is similar to the UKs primary energy consumption in 2015. However, an additional 63 mtoe reduction in energy demand is needed to reach the 2020 energy efficiency target of 20 percent improvement compared to the 2007-projections.

A 30 percent efficiency target 2030 implies an efficiency improvement of close to 15 percent compared to 2016-levels, while the Parliament proposal of 35 percent efficiency gains would imply a 20 percent improvement compared to 2016-levels; or reductions similar to Germany's total energy demand.

The EU's renewable energy target is expressed as a percentage of final energy consumption, which is the total energy consumed by end users (households, industry, agriculture, etc). This share stood at 17 percent in 2016, according to Eurostat, with 20 percent being the target set for 2020.

Electricity generation from renewable energy sources constituted close to 30 percent of European power production in 2016. In the scenario with 30 percent energy efficiency and 27 percent renewable energy (the Council position), we forecast a 50 percent share of renewable energy in the electricity mix. Increasing energy efficiency to 35 percent will lower

Figure 1: Energy efficiency pathways - compared to baseline projections from 2007



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electricity demand slightly, facilitating a more rapid intake of growing renewable energy. We estimate the share of renewable energy in the electricity market at 65 percent if the renewable energy target is upped up to 35 percent in such a scenario (the Parliament position).

Is a 65 percent renewable share in the electricity sector achievable? Looking back, EU doubled its electricity production from renewable energy sources from 2005 to 2017 from around 500 TWh to 1000 TWh. Up to 2030, we find that another doubling of renewable production would be necessary in order to reach a 65 percent share (which constitutes 2 000 TWh). Using history to predict future growth is obviously a questionable approach, but sometimes helpful to put numbers in perspective.

To this regard, it is worth noting that Germany is determined to phase out nuclear by 2022 and has increased its target of renewable energy share in the power mix from 50 percent to 65 percent in 2030 as part of the new coalition Government platform. For a further analysis what this could imply for coal phase out in Germany, see our analysis *The German Way: Easier to say yet to more renewables than no to coal*, also available here. No doubt, getting there would require substantial build-out of renewable energy and deep cuts in power sector emissions in Europe.

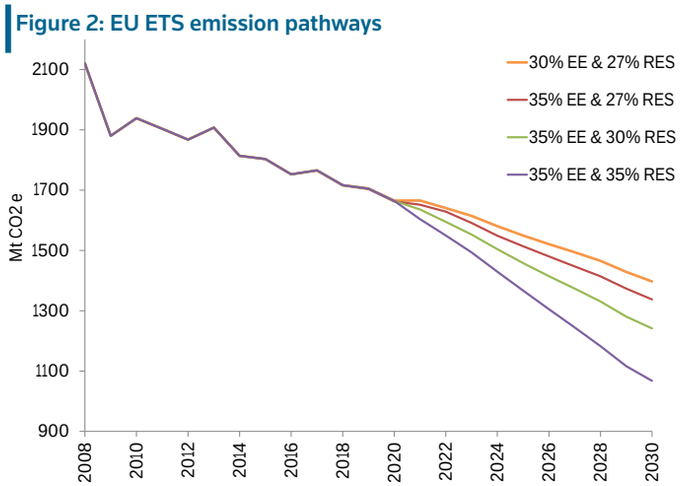
DEEPER EMISSION CUTS

The reduction in EU ETS emissions corresponding to the various scenarios are shown in Figure 2. The differences between the scenarios are first and foremost due to reductions in the power sector: With improved energy efficiency, total electricity demand decreases, thereby reducing emissions from the power sector. And with more uptake of renewable energy in the electricity mix, generation of electricity from fossil fuels will gradually be pushed out, leading to a substantial decrease of emissions. Figure 2 shows that 2030 emissions are reduced by a quarter in the Parliament position compared to the Council position – and accumulated over phase 4, emissions are 13 percent lower with the Parliament targets.

The linear reduction factor (LRF) of the EU ETS set at 2.2 percent from 2021 onwards is aligned with the overall 2030 climate and energy framework as adopted in October 2014. It is set at that level in order to achieve a 43 percent reduction in the EU ETS sectors by 2030 (compared to 2005), ensuring that the ETS sectors deliver their share of reductions towards the overall 40 percent reduction target.

Aligning climate ambition with the deeper emission cuts associated with higher targets on energy efficiency and renewable energy implies a steeper LRF. Should the overall framework be adjusted as part of the processing of the Clean Energy for All- files, the current LRF is "out of synch", and it can clearly be argued that it should have been higher to ensure a faster reduction of the annual cap for the EU ETS. However, the discussion what the LRF "should" have been in light of a more ambitious overall framework is not a very fruitful one – given that the revised ETS directive has just been agreed. But it triggers the question whether the system's buffer against demand-side fluctuation is sufficient.

Figure 2: EU ETS emission pathways



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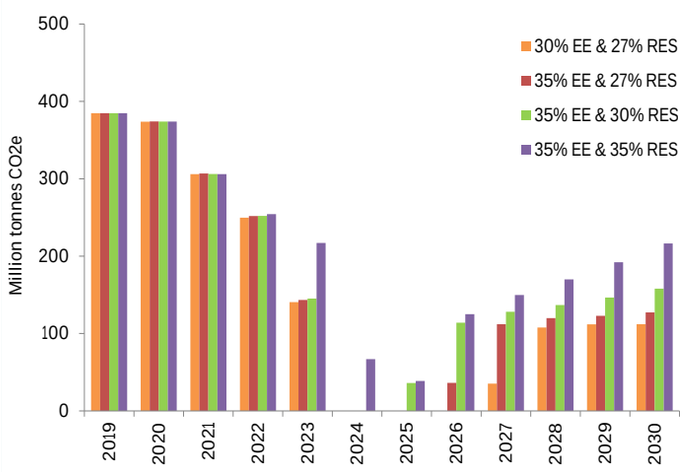
HOW WILL THE MSR COPE?

The Market Stability Reserve (MSR) was established with the double aim of tackling the historical surplus and prevent surplus from building up in the future – or, in the exact wording of the MSR decision: "make the EU ETS more resilient in relation to supply-demand balances, so as to enable the EU ETS to function in an orderly market". How well will the MSR cope in scenarios of increased ambition on renewable energy and energy efficiency, leading to lower emissions and increased surplus in the EU ETS?

Figure 3 shows the yearly intake to the MSR in the different scenarios. As the emission reductions and hence also the increase of the EU ETS surplus is only incremental in the first few years (as illustrated by Figure 2), the operation of the MSR is not very different across the scenarios in the first few years. From 2021 onwards, there emission pathways of the scenarios start to diverge – and as the MSR operates with a time-lag (explained by Textbox 1), the effect becomes visible from 2023 onwards

Figure 3: Operation of the MSR - annual intake



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– and most pronounced in the most extreme EE/RES scenario.

Table 2: Cumulative intake to the MSR

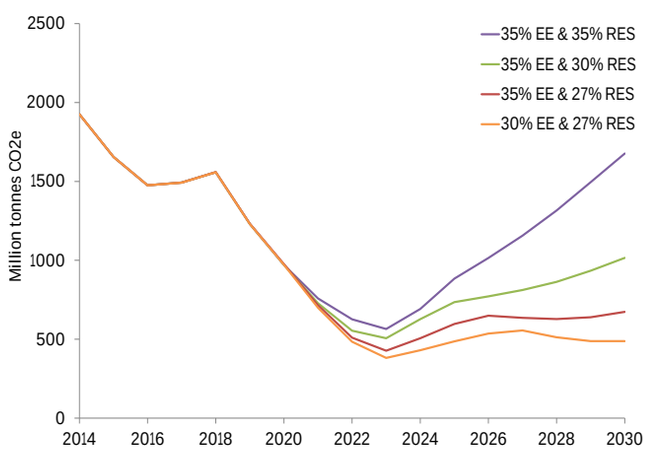
Scenario	MSR intake 2019-2030
30EE/27RES	1.8 Gt
35EE/27RES	2.0 Gt
35EE/30RES	2.2 Gt
35EE/35RES	2.5 Gt

** Backloaded (900 Mt) and unallocated (est. 740 Mt) not included in these numbers*

Overall until 2030 the MSR soakes up some 700 million allowances more in this scenario than under the 30EE/27RES-scenario. The cumulative intake to the MSR until 2030 is displayed in Table 2. In other words, without the mechanism is place, the supply-demand balance would have been severely impacted; in short – the MSR is doing what it was set up to do. With relatively modest levels of additional surplus, the MSR is able to counteract the effect on the ETS balance. This is illustrated by Figure 4, showing little divergence between the scenarios until the mid-2020s, and also relatively modest changes throughout the full forecasting period in the scenario of more energy efficiency improvement.

However, in scenarios with high levels of increased oversupply – illustrated in particular with the 35EE/35RES-scenario, the MSR falls short of soaking up the additional surplus quickly enough to stabilise the marked. The MSR is simply not able to take in sufficient volumes with the rapid increase in emission reductions – remember also that the intake rate is back at 12 percent from 2024 onwards.

Figure 4: Market balance



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Textbox 1: The Market Stability Reserve (MSR) explained

The MSR can withhold allowances from the market, or release allowances into it, based on the following rules:

The basis for the operation of the MSR is the market surplus (legally referred to as "Total Number of Allowances in Circulation") defined as: the allowances issued since 2008 + international credits used for compliance since 2008 – verified emissions since 2008 – any allowances cancelled – allowances currently in the MSR. Note that the aviation sector is excluded from this calculation. On 15 May of each year (year x), the Commission will publish an official estimate for the total number of allowances in circulation for the previous year (x-1). The first publication will take place in 2017.

Rules for withholding allowances: If the published number of allowances in circulation exceeds 833 million tons, 24% of that amount will be withheld from auctions scheduled from 1 September of year x to 31 August of year x+1. From 2024 and onwards, the withdrawal rate will be 12%. The MSR will begin withholding allowances in January 2019.

How exactly will the MSR impact auctioning in any given year? Using 2019 as an example - the timing mentioned above means that 16% of the volume announced on 15 May 2018 will be withheld from auctioning from January to August, and 8% of the volume announced on 15 May 2019 will be withheld from auctioning from September to December.

Rules for releasing allowances: If the published number of allowances in circulation is lower than 400 million tons, 100 million allowances will be released into the auctions scheduled from 1 September of year x to 31 August of year x+1. If the amount of allowances in the reserve is lower than 100 Mt, all allowances will be released.

Textbox 2: Key assumptions across all scenarios

- EU ETS Phase 4 policy framework as adopted.
- GDP annual growth rates (Oxford Economics):
  - 1.8% until 2030
  - 1.3% 2021-25
  - 1.1% 2026-2030
- Fuel prices: Latest forward curves until 2020, World Bank commodity price forecast until 2030.
- Coal phase-out: National plans at face value
- Market behaviour: 3 years ahead for hedging and 5 years ahead for abatement planning.
- UK remains part of the EU ETS also in phase 4.

BEARISH PRICE IMPACT

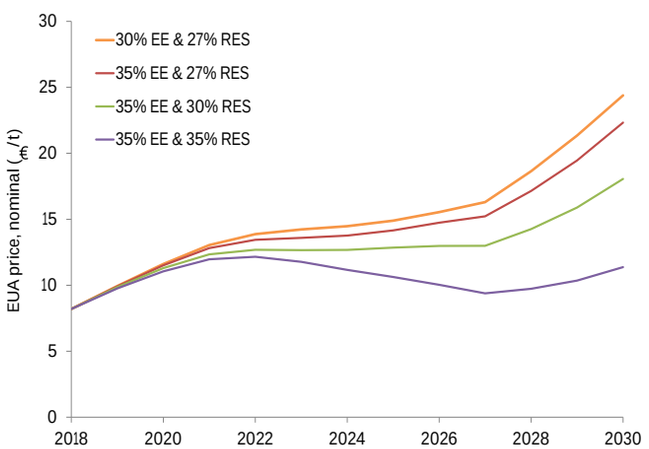
The changes to the market balance are mirrored in changed carbon price paths, as shown in Figure 5. The results stem from using our long term carbon price forecasting model. A thorough explanation of how the model is built up and works can be found on the price forecasting page in Eikon , while key assumptions are displayed in Textbox 2.

In the Council (30EE/27RES)-scenario, we forecast prices at 12 €/t in 2020, via 15 €/t mid-phase, ending at 24 €/t in 2030. The price increase towards the end of the forecasting period is explained by the tighter balance further out in time, beyond 2030. As we assume that market participants look into the future when behaving today (3 years ahead for hedging, 5 years ahead for abatement planning), future shortage will reflect on prices at an earlier point in time.

The effect of increased energy efficiency ambition is only slightly noticeable. In this scenario the MSR is by and large able to alleviate the effect of reduced demand due to energy efficiency improvements. In the European Parliament scenario (35EE/35RES), however, carbon prices in 2030 are halved compared to under the Council ambition level (30EE/27RES), ending at the same level as a decade earlier, at around 11 €/t. On average over phase 4, prices are 35 percent lower than under the Council position.

This reflects the shortcomings of the MSR with its current design parameters in situations of rapid growth in the surplus. The mechanism is not set up to absorb very large levels of oversupply. An intake rate set at 24 percent all the way through 2030 (which could be an option for the 2021 MSR review), would lift the curve considerably; prices in the Parliament (35EE/35RES)-scenario would be on average 20 percent lower than with the Council ambition level, ending at 18 €/t in 2030.

Figure 5: Carbon price pathways



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CANCELLATION FROM THE MSR - COUNTERACTING THE EFFECT OF OVERLAPPING POLICIES

We have argued before and continue to see that the provision to cancel allowances from the MSR was the most striking novelty of the ETS reform. The Parliament and the Council position had different models of cancellation, the final compromise being very close to the Council position.

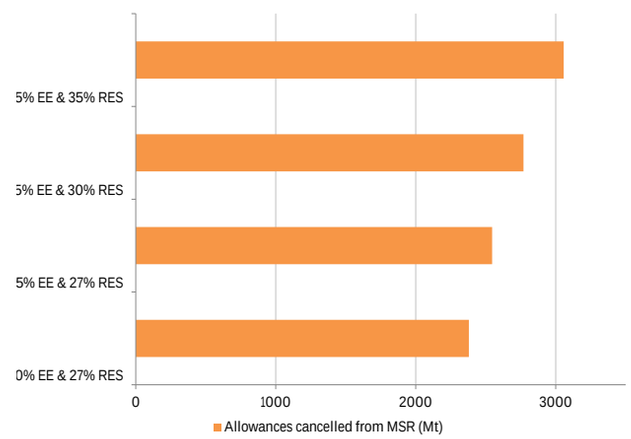
Compared to the Parliament position of a one-off cancellation of 800 million allowances in 2021, the final deal stipulates that from 2023 onwards, any volume in the MSR overshooting the regular EUA auction volume in the previous year, will be invalidated (which we interpret to mean "cancelled" for all practical purposes). Within a 30EE/27RES-scenario, we estimate this to result in the cancellation of 2.2 billion allowances in 2023, in total 2.4 billion allowances over phase 4 (see Figure 6).

> **"MSR cancellation is also an instrument to couteract the effect of overlapping policies**

Cancellation from the MSR does not affect the market balance in phase 4, and hence, in our modelling, will not affect carbon price levels within a 2030 forecasting horizon (although we do not rule out a psychological effect as a massive volume is rendered invalid in 2023) .This is because the allowances that are cancelled are already sitting in the MSR, stored away from the market, and would not return to the market until the balance falls below the lower threshold defining a critical minimum of surplus needed to cater for hedging needs (defined as 400 Mt), and then only in modest portions of 100 Mt per year.

As we estimate that the MSR will hold 640 million allowances in 2030, the effect of the cancellation will not be felt until well into phase 5 or 6 when the reserve is emptied and there is real scarcity in the market. Without the cancellation provision, the MSR would contain more than 3 billion allowances in 2030 and the reserve would be depleted 24 years

Figure 6: Cancellation from the MSR



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later than with the cancellation provision in place – thus delaying the sense of urgency, triggering the more expensive abatement at a much later point in time.

So while not having an impact within the 2030 timeframe, cancellation from the MSR increases the long term climate ambition of the system. This effect becomes even more pronounced in the scenarios of increased energy efficiency and renewable energy ambition – in the three scenarios, an additional 170, 290 and 680 million allowances are cancelled from the MSR compared to the under the Council position, illustrated by Figure 6 .

The provision to cancel allowances from the MSR therefore also functions as an instrument to counteract the effect of overlapping policies as the MSR larger volumes soaked up by the MSR in scenarios of higher energy efficiency and renewable energy ambition will be permanently wiped out from the system. Thus, with the cancellation-provision as adopted, EU policy-makers also implicitly have adopted a provision to counteract the effect of overlapping police – in the long term.

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