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AN UPGRADE FOR THE EU ETS: MAKING ART. 29A AND 30H FIT FOR EFFECTIVE PRICE CONTAINMENT

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EXECUTIVE SUMMARY

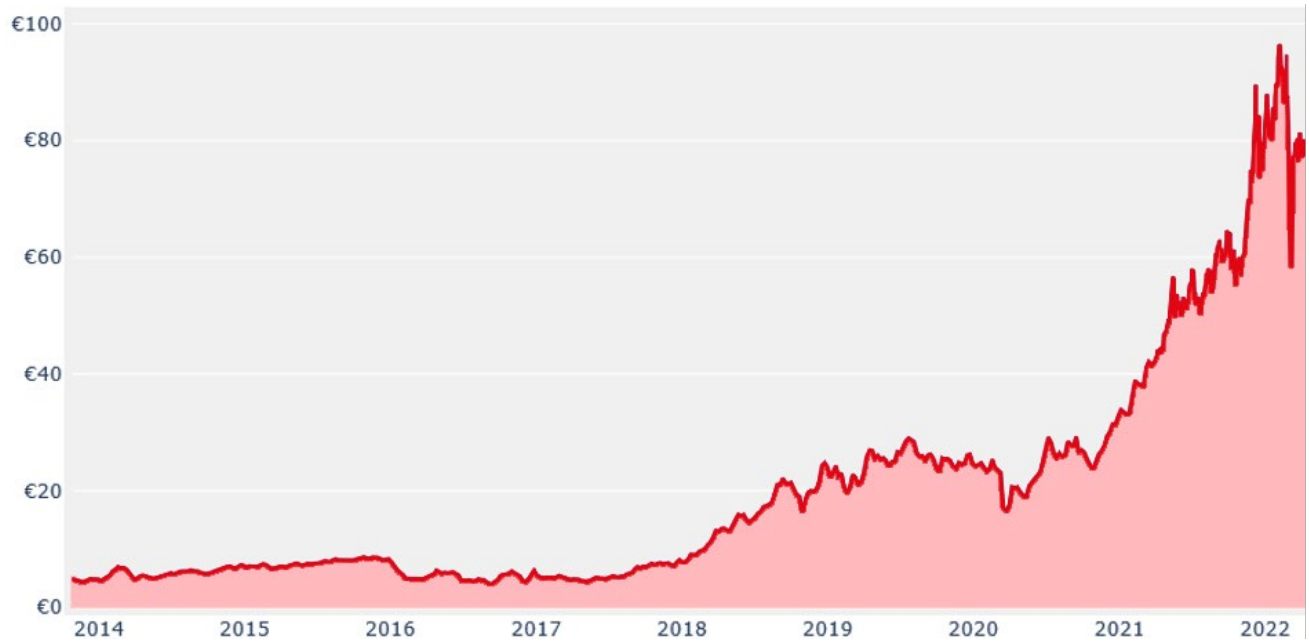
- Price hikes and volatility have prompted a debate among policy makers about price stabilization measures in European carbon markets.
- The European Commission's 'Fit-for-55' reform proposal for the EU ETS envisages two separate carbon markets, each featuring an instrument intended to reduce price volatility: Articles 29a and 30h.
- Multiple amendments were put forward in the European Parliament aimed at refining but not altering the general design proposed by the Commission.
- We establish five principles for the general design of price stabilization measures: continuity, predictability, synchronism, symmetry, and adjustability.
- Following our analysis, we find current policy proposals in the EU's legislative process inadequate to address price fluctuations.
- We propose a Price Containment Mechanism (PCM) which adheres to the five principles and which on top of stabilizing prices would also be a major step forward in reducing policy incoherence of EU climate policy.

THE CURRENT DEBATE ABOUT PRICE STABILIZATION

After a decade of one-digit prices for European Union Allowances (EUA), the past four years have seen a rapid increase in prices up to 96 € in February 2022 (see Figure 1). This price increase, which resembles a hockey stick rather than a gradual growth curve, has stipulated concerns among policy makers, market participants and other societal stakeholders about the sustainability of price developments (Gerlagh et al., 2022). In particular, the quadrupling of EUA prices between March 2020 and March 2022 has focused attention on the rate of change in allowance prices. The speed of ongoing and planned abatement, it seems, is exceeded by current and expected scarcity of EUAs. When compared to earlier debates about market signals, we see a marked shift of attention away from the structural supply-demand-imbalance of the 2010s. Back then, low prices and the abundant supply of EUAs led to the introduction of the Market Stability Reserve (MSR) in 2015. Despite its substantial shortcomings in design, the MSR copes well with past and unexpected shocks to demand by gradually absorbing the subsequently accruing supply of allowances (Bruninx & Ovaere, 2022; Gerlagh et al., 2020; Perino et al., in press). The recent discussion about price fluctuations gained further momentum in the wake of the war of the Russian Federation against Ukraine, when a short-term slump of EUA prices of -40% within a few days showed volatility knows two directions. Market participants nearing the EU ETS April-2022 compliance deadline saw themselves confronted with price differences of more than 30 € per EUA, severely challenging risk-management. Clearly, the EU ETS is not equipped with an effective measure of price stabilization able to guide price expectations of market participants. The market is thus exposed to increased uncertainty about commodity prices, economic cycles, political decisions and speculation. The quest for finding an answer for how to decrease price volatility and strengthen market participants' expectations about the future price path is in full swing.

Formally, the existing rules for the EU ETS contain price stabilization measures in Article 29a of Directive 2003/87/EC, but they have not been activated so far. Given recent price jumps in both directions, this in itself indicates that they might not be up to the task. Mechanisms that are meant to steer, stabilize, dampen or contain the price path can be found as automatic to (semi-)discretionary versions in many modern ETS around the globe (Burtraw et al., 2020; Friesen et al., 2022). Graphically speaking, they bend the vertical supply curve of a rigid ETS into different shapes, allowing changes in demand to translate into both price and emission responses. These hybrid approaches to ETS-design between fixed-cap emissions trading and fixed-price taxing have been studied for some time, making for a broad discussion on price floors and ceilings, both fixed and dynamic, asymmetric and symmetric (Burtraw et al., 2010; Flachsland et al., 2020; Wang et al. 2020; Roberts & Spence, 1976; Wood & Jotzo, 2011). An adjacent and less ample strand of the literature investigates endogenous supply adjustments based on price changes rather than levels (Karp & Traeger, 2021)

FIGURE 1: EUA PRICES SINCE 2014



Source: Sandbag (https://sandbag.be/index.php/carbon-price-viewer/)

WHAT'S ON THE TABLE

On 14th June 2021, the European Commission (COM) published its proposal for a reform of the EU ETS as a part of the broader agenda of the "Green Deal" – the EU's strategy to achieve a sustainable transformation of the European economy to net-zero greenhouse gas emissions until 2050. The proposal for amending the "EU ETS Directive", Directive 2003/87/EC, sets out the legal structure for two carbon markets: the original ETS-1 for emissions from power production and heavy industry and a new ETS-2 for buildings and road transport emissions. Both ETS are to feature a supply adjustment mechanism triggered by a measure of price volatility, i.e. price change (see European Commission, 2021a, p. 20)[1]. While ETS-1 is to retain its original Art. 29a named "Measures in the event of excessive price fluctuations", ETS-2 shall feature "Measures in the event of excessive price increase" set out in Article 30h. From a perspective of institutional evolution of legal norms, Art. 30h is both a more detailed and more encompassing derivative of Art. 29a. The structure of the respective adjustment mechanisms shows identical, similar and diverging aspects as laid out in Table 1. In effect, both mechanisms shall trigger a release of additional allowances from the MSR when certain conditions pertaining the price of EUAs are fulfilled.

In the following, we present key features for a coherent and potent design for price stabilization within an ETS and scrutinize the COM's proposed measures accordingly. Then, we present our own proposal for a Price Containment Mechanism including draft versions of the corresponding legal texts.

TABLE 1: COMPARISON OF KEY PARAMETERS OF COM PROPOSAL'S ART. 29A AND 30H.

	ART. 29A	ART. 30H
Context	**ETS-1**	**ETS-2**
Objective	counter price fluctuations not corresponding to changes in market fundamentals	counter price fluctuations
Decision Authority	1) COM and if "yes" then 2) Committee established by Art. 9 of Decision 280/2004/EC	automatic implementation by COM
Price Thresholds	tripling	doubling and tripling
Observation Period	6 months	3 months
Preference Period	prior 24 months	6 months
Size of Intervention	100 mio. + unspecified amounts	50 mio. or 150 mio.

1 Original texts of the COM proposal for Art. 29a and 30h can be found in Annex A.

FIVE PRINCIPLES FOR PRICE STABILIZATION IN AN EMISSIONS TRADING SYSTEM

When designing policy instruments, one needs to bear in mind the institutional environment and policy mix they are meant to be a part of (van den Bergh et al., 2021). Not taking this into account may result in severe losses in efficiency and effectiveness of the policy mix and may even lead to counter-productive outcomes (Willner & Perino, 2022).
Looking at price fluctuations, on the one hand, they contain valuable information about scarcity in the system. Responsive prices allow to efficiently process decentralized information about abatement options, technology deployment and give leeway for adjustment to changing economic conditions. On the other hand, if price changes occur very suddenly or are not based on changes in fundamentals, market participants cannot form expectations about a mid- to long-term trend in the price path and the system's resilience to shocks. A failure in prediction likely leads to an inefficient allocation of financial resources, increases the risk of unsustainable investment in energy and industrial infrastructure, increases costs of abatement and puts avoidable pressure on fiscal budgets. Bearing this in mind, we define five principles for an effective price stabilizing measure: continuity, predictability, symmetry, synchronism and adjustability.

A) CONTINUITY

Fixed thresholds triggering discrete interventions as proposed for Art. 29a and 30h (see Table 1) risk attracting both speculation by market participants and strategic behavior by regulators, as the implication of being marginally above or below the threshold is substantial.

FIGURE 1:
DISCRETE INTERVENTIONS UNDERMINE MARKET EQUILIBRIUM

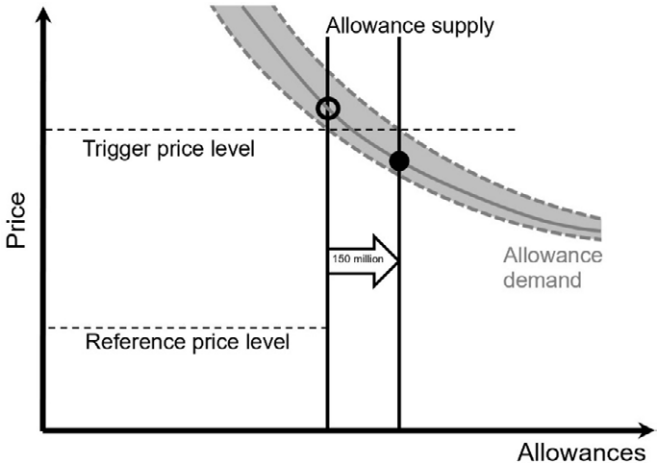


Figure 1 illustrates how discrete interventions undermine the existence of a market equilibrium consistent with fundamentals even in perfectly competitive markets, i.e. without considering speculative or strategic motives of market participants. In the figure, for all allowance demand curves within the grey shaded area no market equilibrium exists that is consistent with market fundamentals. The reason is simple: The prices in an allowance market are connected across time by market participants' expectations and intertemporal trading activities. An expected future price drop induces a reduction of the current market price. Otherwise, traders would be better off by selling allowances now and buying them back later, when they anticipate prices to be lower. In the case of the discrete interventions induced by Art. 29a and 30h, there are situations for which no such price path consistent with expectations exists. The equilibrium price under the cap without an intervention would exceed the trigger level (hollow circle). However, if the intervention takes place and market participants correctly anticipate it, then the equilibrium price is below the trigger level (filled circle). Hence, there is no market equilibrium where the expectations of market participants are consistent with the true market fundamentals, i.e. allowance supply and demand. Either they anticipate that the intervention takes place and it does not, or the other way around. Should the system ever enter this region, one would expect erratic price movements and substantial speculation. Similar concerns about such 'threshold effects' with respect to the MSR's market interventions have motivated COM to propose changes to the reserve's trigger values (see European Commission, 2021a, pp. 13, 20, 33).
Continuity addresses this problem of discrete interventions. Supply adjustments that are continuously increasing in the price level create an upward-sloping supply function. As a result, for each set of fundamentals there is only one equilibrium and it is consistent with market participants' expectations. A direct implication of using smooth interventions is that they need to start at smaller growth rates of the allowance price and gradually build up. Furthermore, such a continuous intervention avoids the gaming of the mechanism by both the regulator and market participants.

B) PREDICTABILITY

Market participants and member states aiming to formulate climate policies with an impact on emissions need to be able to form reliable expectations on future allowance prices, the system's response to changes in market fundamentals and speculative activities (Stiglitz & Stern, 2017). This holds irrespective of the source of demand changes and the channel of supply adjustments. Potent price stabilization mechanisms build trust in the market and reduce the risks involved in mid- to long-term investment decisions needed for a successful transition to a low-carbon economy.
Articles 29a and 30h differ in their design with respect to predictability. While Art. 30h establishes an automatic response independent of a decision by another party, Art. 29a features a multi-step decision progress (see Table 1). First, it is a decision of COM to assess whether the price trigger has been reached and subsequently, whether or not to convene the Committee established following Art. 9 of Decision No. 280/2004/EC, which needs to decide about the nature of the observed price increase. Only if theCommittee finds the price evolution not to be driven by fundamentals, it can decree a measure laid out in 2(a) or 2(b) of the Article. The absolute size of the intervention is not specified ex ante, but left open.[2] Thus, from the perspective of compliance traders, Art. 29a creates uncertainty about when the crite-

2 Art. 29a(2.(a)) allows to "... bring forward the auctioning of a part of the quantity to be auctioned" and Art. 29(2.(b)) allows to "... auction up to 25% ..." (emphasis added).

rion of the price increase is met, what constitutes changes in fundamentals and price changes caused thereby, how to distinguish the causes of a price increase, and how many EUAs will finally enter the market should a measure be taken. Furthermore, Art. 1(7) of Decision (EU) 2015/1814 constitutes an automatic additional intervention in case any measure is taken by the Committee: In case the MSR does not already release allowances due to Art. 1(6) of named Decision, a total of 100 million EUAs shall be added to member states' auction volumes. This, too, hinders anticipating the impact of an intervention based on Art. 29a. It remains unclear how quickly the process described above could be enacted as no indication about the length of the procedure is included in the legislation.

In the past, attempts have been made to enable an intervention in the carbon market based on Art. 29a, e.g. by Poland in 2018.[3] However, COM did not agree with the Polish approach to calculating the price change described in Art. 29a(1) and did not convene the Committee. This shows a vagueness as COM has not disclosed a definitive method to calculate whether the trigger has been reached. Key terms such as "average price" and "two preceding years" allow more than one operationalization. For the latter, its disputed whether they include the six months observation period, i.e. end with the observation period or end at its beginning. Any change in definition leads to different indicators for Art. 29a to be triggered.[4] In contrast, once triggered, Article 30h tasks COM with implementing the measures specified without additional conditions being met. With regard to predictability, Art. 30h is a clear improvement on Article 29a.

All in all, the uncertainty originating from Art. 29a diminishes market participants' ability to form robust expectations about future market equilibria and thus price developments. Especially in times of exogenous shocks, not knowing if and when additional supply adjustments happen does not help reduce erratic or abrupt changes in market behavior – it might even lead to more pronounced volatility as the mechanism's impact will resemble an additional shock rather than a soothing certainty that stabilization measures will counteract sudden changes in the market environment.

Policy makers in member states working on policies with a direct or indirect impact on the demand for allowances benefit from predictability as well. Policies that overlap with the EU ETS lead to a change in the demand for allowances, e.g. delaying a national coal phase-out (+), reducing or stopping the import of natural gas (+), increased electricity consumption from promotion of electric mobility (+), or subsidizing energy efficiency (-). Such changes translate into price responses and by means of the stabilization mechanism's supply adjustments, may lead to changes in the overall cap and distort the intended climate impact of overlapping policies. The less predictable these changes, the more difficult the valuation of options for national policy makers when faced with alternative ways of addressing the economic transition in connection with climate targets.

3 https://www.montelnews.com/news/943397/poland-to-seek-ec-carbon-market-intervention--report

4 See the blog post "Trigger-happy" by Alessandro Vitelli about the dispute about Art. 29a's trigger activation: https://www.carbonreporter.com/post/trigger-happy.

c) Symmetry

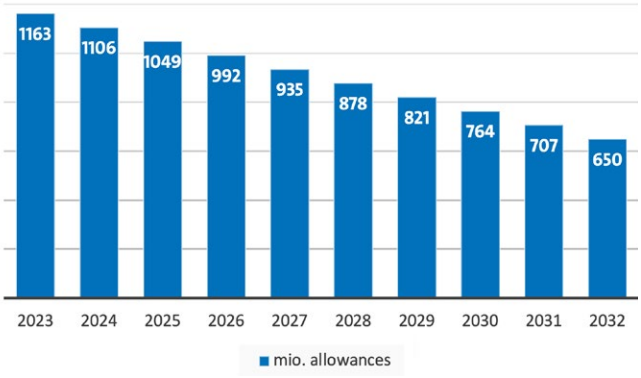
The long-run cap should not excessively depend on the sequence of price changes, i.e. path-dependency should be avoided. The total cap at any given time should depend on the price at that moment and not on the precise price path that led to this outcome. In contrast, the interventions following the rules of Art. 29a and 30h are not symmetrical. This means that allowances that have once been issued in reaction to a price jump will stay in the market irrespective of substantially dampened prices later on. This in itself creates incentives for speculation and market inefficiencies. From the vantage point of controlling for price fluctuations that are affected by the existence of a stabilization mechanism and expectations about its activity, Art. 29a and 30h do not help in the event of sustainably falling prices

Another aspect of symmetry pertains to ETS with an endogenous overall cap. Both ETS-1 and ETS-2 feature cancellation mechanisms via their respective MSR, rendering the overall cap a function of the markets' development. With the price stabilization measure being one-directional in feeding the market, the potential for increases of climate ambition in times of consistently lower prices are left ignored. A symmetrical mechanism fixes this and further stabilizes price expectations as it results in a dampening corridor.[5]

d) Synchronism

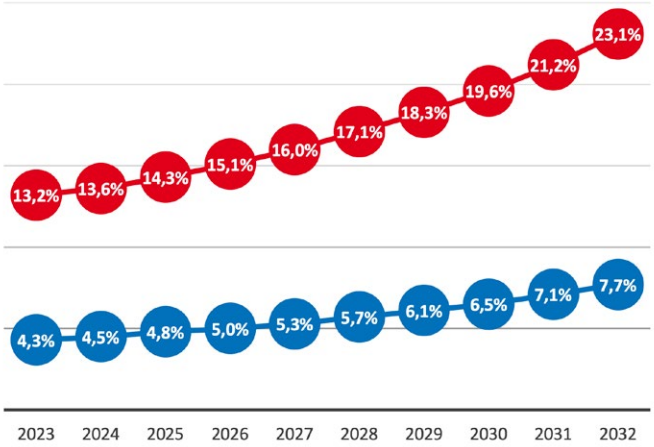
Another flexibility needed by a potent mechanism is synchronization with supply. Aligning the intervention with the annual cap allows for stabilization of intervention impacts. Both, ETS-1 and ETS-2 feature an annually decreasing cap (see Figure 2 for ETS-2). Measures of Art. 29a and 30h feature static amounts of allowances to be released, e.g. 50 or 150 mio. by the latter. In effect, the relative impact to supply created by an intervention increases every year, which creates substantial price uncertainty. In case Art. 30 is triggered in 2025, it would add an additional 14.3 % to supply in that year, while the impact would rise to 23.1 % if it was triggered in 2032 (see Figure 3). In combination with a lack of symmetry, this may lead to severe fluctuations in prices and lead to unintended effects concerning price levels.

FIGURE 2: A PROJECTED CAP FOR ETS-2
(calculated according to option EXT1 in Figure 23 (European Commission, 2021b, p. 94)



5 See Graphs 1 to 4 in Graphical Illustrations below.

FIGURE 3: RELATIVE QUANTITY ADDED TO SUPPLY BY ART. 30H



Synchronization with market size and pegging the intervention to the annual cap allows for stabilization of intervention impacts. This is valid for continuous interventions, too. Furthermore, synchronism decreases the need for adjustments or rebasing during review cycles.

e) adjustability

Inflation rates constitute the difference between the nominal and the real price of emissions. Economically, the change in the real price is the one that matters.
If left unadjusted, inflation leads to relatively stronger or earlier interventions for given real price increases and to lower and later interventions for given drops in real prices. It hence changes the sensitivity of the mechanism and introduces a bias towards expansions of supply. In case of persistently high inflation rates, this may result in situations where the supply of allowances gets heavily out of step with the economy and interventions in the market become stronger than justified by market fundamentals.
Admittedly, with a trigger requiring a tripling of prices and inflation rates below 2%, the difference between nominal and real price change does not weigh in much. However, with the continuous mechanism we propose that starts at much lower price changes and where the size of the intervention depends on the precise magnitude of the price change, the difference becomes relevant. With inflation rates rising, taking them into account is recommendable. Thus, an improvement of Art. 29a and 30h alongside principles a) to d) should entail adjustment provisions for inflation.

A price containment mechanism (PCM) for ETS-1 and ETS-2

We propose a price containment mechanism (PCM) that adjusts the amount of auctioned allowances up- or downwards in case there are price changes outside a predefined range. For a specific text proposal for replacing Articles 29a and 30h, please see Annex B.

The PCM kicks in if the inflation-corrected price growth rate exceeds or undercuts a Price Change Threshold (e.g. > + 20 % or < - 20 %). This inflation-corrected price growth rate is measured as the average auction price of the previous quarter compared to the average auction price of the corresponding quarter in the previous year. The PCM intervenes **symmetrically** by responding to both price drops and hikes. Its reference point of reaction lies in the previous year (corresponding to the rate of inflation) but reacts within three months after the threshold has been reached.

The size of the intervention is tuned to the size of the price change and thus adheres to **continuity**. A sequence of smaller price jumps (all above the threshold) yield an intervention similar to one big jump of equal size. Moreover, interventions are **reversible**, i.e. if the price first jumps up and then down again to the original level, the net intervention is zero.

To make the mechanism future-proof, i.e. for the forthcoming reductions of market-size, and to prevent increasing relative impacts of its interventions, we propose to **synchronize** it with the annual cap. For this, a constant Base Rate is multiplied with the cap of a given year. In consequence, the size of the intervention triggered automatically shrinks over time in the same manner as the cap. In effect, while larger price changes trigger relatively larger interventions, they will stay in line with overall market size. A simple, publicly available factor adjusts the Price Change Threshold for inflation. Table 2 gives an overview of the different mechanisms' adherence to the five principles laid out before.

BLE 2: CHECK OF THE PRINCIPLES OF PRICE STABILIZATION: + (OBEYS), - (DOES NOT OBEY).

	ART. 29A	ART. 30H	PCM
continuity	-	-	+
predictability	-	+	+
symmetry	-	-	+
synchronism	-	-	+
adjustability	-	-	+

The PCM does not define a numerical value for a floor or ceiling price, as it only reacts to changes in price, not to price levels. Moreover, it does not preset a market price as it leaves price formation completely to auctions and the secondary market. As market participants (compliance traders, intermediaries and profit-seeking traders) take note of the mechanism, it is capable to guide their expectations and thus reduces volatility already by its mere existence. Importantly, the PCM's interventions are linked to available EUAs in the respective MSR, which ensures that the overall cap is not exceeded.

HOW CAN THE PCM BE TUNED AND ADJUSTED?

The PCM is tuned by only the three aforementioned parameters: The Price Change Threshold, the Base Rate and the Capacity. The equations defining the PCM can be found in Annex C.

The Price Change Threshold tunes the sensitivity of the PCM to the amplitude of price fluctuations. The closer it is set towards zero, the more sensitive the PCM and the more often it would be triggered. Values to choose as thresholds could be market interest rates or other values that constitute "excessive price fluctuation" in the eyes of policy makers. Furthermore, it is possible to cater to special interests as e.g. rather price-sensitive stakeholders would prefer smaller values. We propose thresholds of [-20%; +20%] to avoid discrete jumps in supply triggered by small changes in the price.

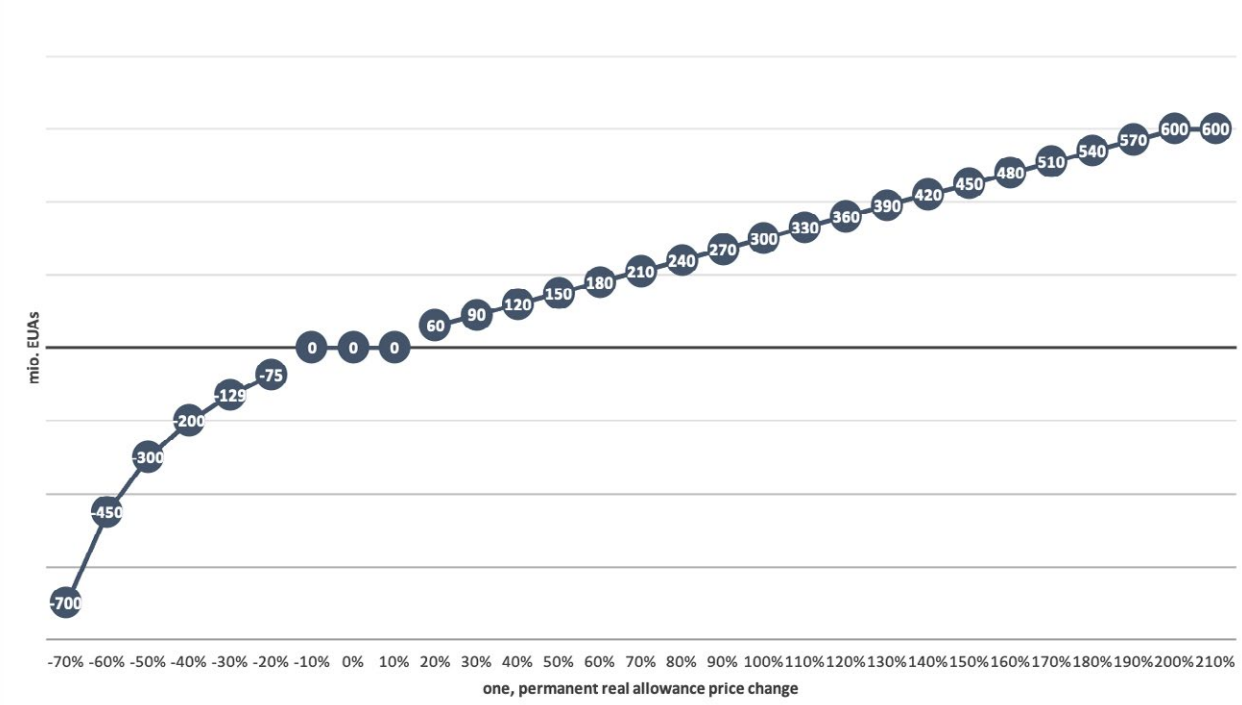
The Base Rate tunes the responsiveness of allowance supply to price changes. The higher the rate, the more EUAs are released in a continuous fashion to a given price change beyond the Price Change Threshold.

The Capacity defines the maximum amount of EUAs the respective MSR may hold and that can be used for price containment by the PCM. Therefore, we add provisions to Art. 1(7) of Decision (EU) 2015/1814. The current proposal of the Commission for ETS-1 is 400 mio. EUAs and we propose to keep at least this amount. Note that the Capacity should be considered together with the Base Rate. If the Base Rate is high but Capacity low, only small shocks will be removed but large ones cannot be countered as the availability of allowances would be insufficient.

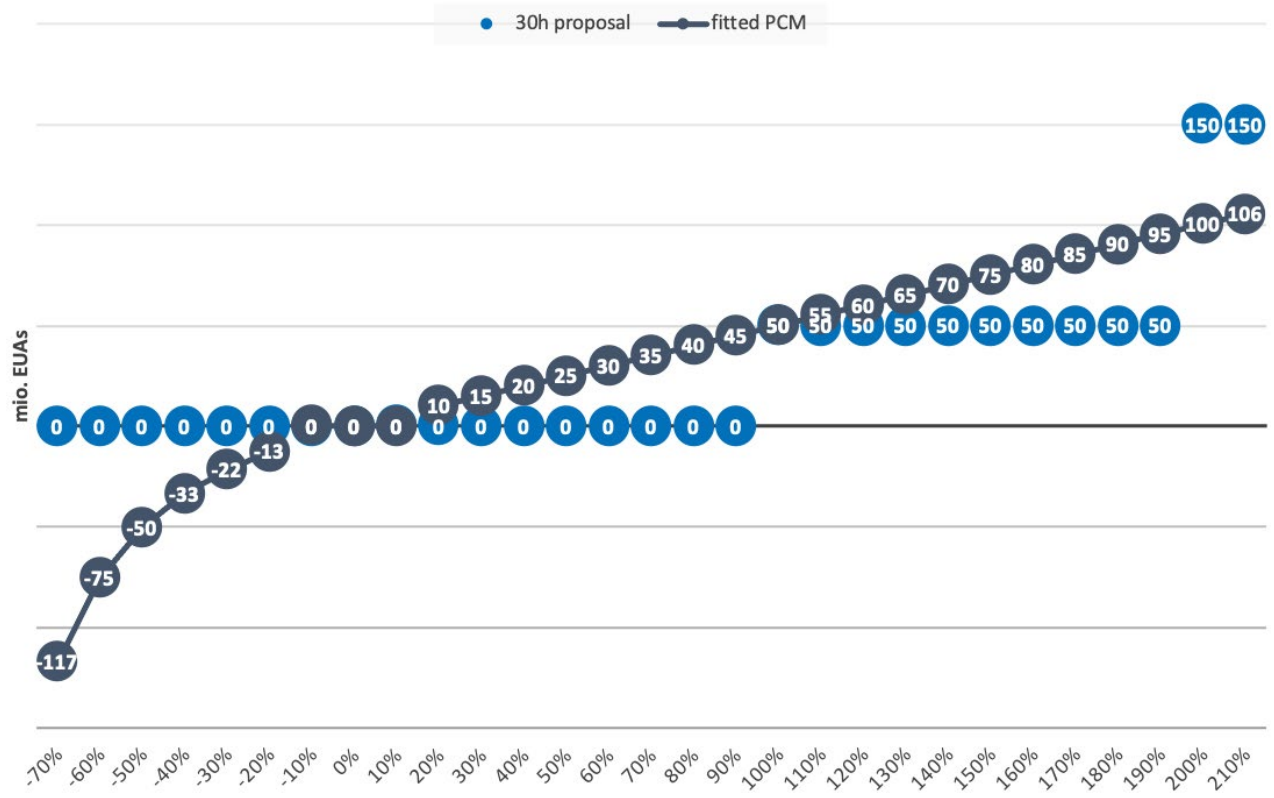
Furthermore, the intervention frequency is a parameter that can be set from short (auction-by-auction) to long periods (a year). However, choosing an extreme would increase administrative burden (e.g. weekly) or decrease reaction time of the PCM (yearly). While the UK-ETS uses monthly interventions, quarterly interventions would still be timely enough to be foreseeable by market participants and guide market behavior – especially since the PCM's intervention can be announced right after a quarter is completed.

GRAPHICAL ILLUSTRATIONS

The following illustrations show the amount of EUAs added or withdrawn from the market over one year depending on a given price change. Please note that this depicts the response to a hypothetical one-off and persistent price change. It triggers responses by the PCM in four consecutive quarters. For temporary price changes, the interventions over one year will be smaller as in some quarters there will be no or smaller interventions. The numbers in the graphs represent aggregated interventions over all four quarters. **Graph 1** shows a sufficient Capacity for the intervention of a price increase of 200%. **Graph 2** compares the proposed mechanism of Art. 30h with the PCM, highlighting Continuity and Symmetry. **Graphs 3** and **4** show changes in intervention intensity depending on different values for the Capacity and the Base Rate.

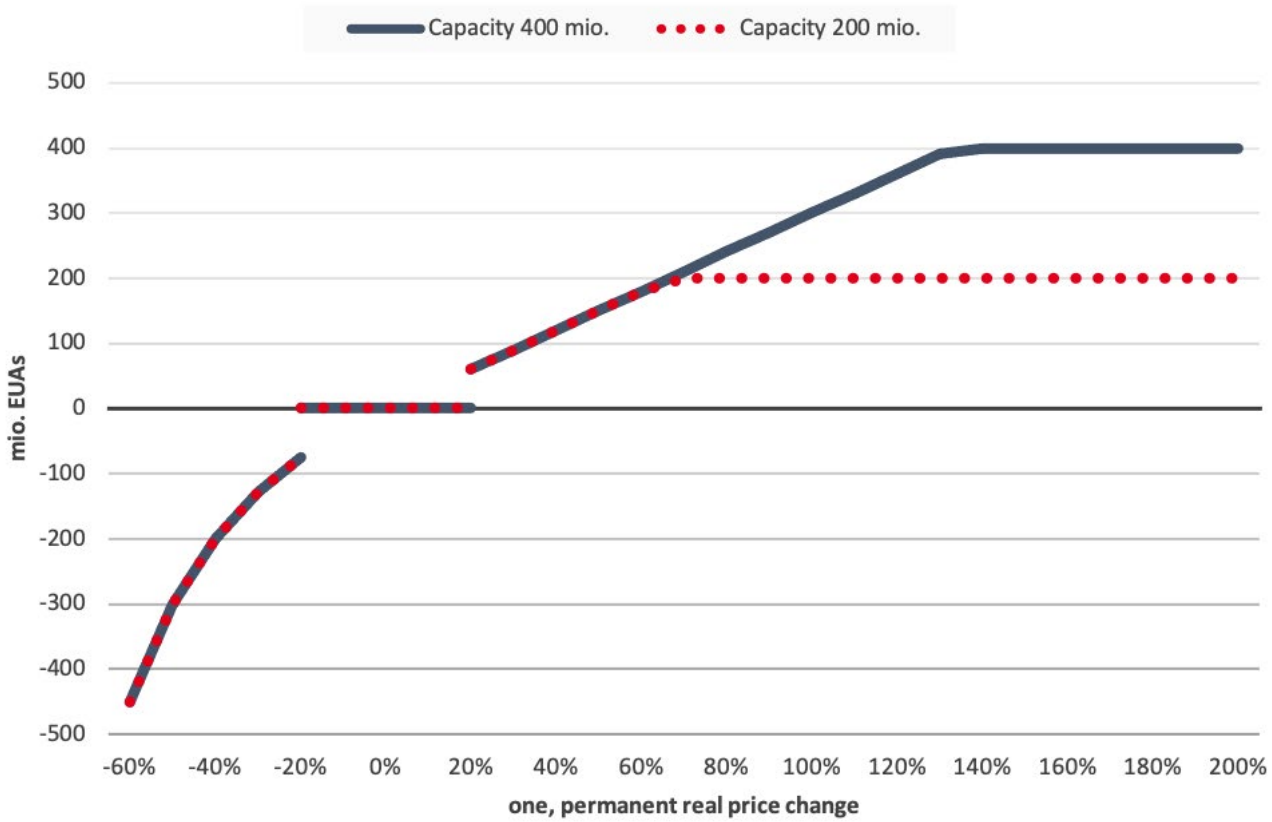


GRAPH 1: PCM FOR ETS-1 WITH CAP OF 1,500 MIO. EUAS IN 2022 AND INFLATION AT 5%
(Price Change Threshold: +/- 20%; Base Rate: 5%; Capacity: 600 mio. EUAs)



GRAPH 2: COMPARISON BETWEEN PROPOSED ART. 3OH AND THE PCM CALIBRATED TO ETS-2
(cap 2023: 1,163 mio. EUAs; Base Rate: 1.08 %)

GRAPH 3: COMPARING DIFFERENT BASE RATES
(cap 1,500 mio., inflation 5%, Price Change Threshold +/- 20%, Capacity 400 mio.)



GRAPH 4: COMPARING DIFFERENT CAPACITIES
(cap 1,500 mio., inflation 5%, Price Change Threshold +/- 20%, Base Rate 5%)

For reasons of comparability, the Base Rate is calibrated alongside the intervention size of the proposed Art. 30h. As a result, the PCM adds 50 mio. EUAs over the course of a year for a doubling of real prices (+100%). Symmetry is visible as the mechanism withdraws 50 mio. EUAs over a year in case of a halving of real prices (-50%).

Increasing the Base Rate will increase the size of the intervention given a certain price change. However, an unchanged Capacity then leads to reduced flexibility in reaction to further price increases, as it is exhausted more easily.

A lower Capacity with equivalent Base Rate leads to a limited response when large price increases occur. In this example, price increases larger than 70% (instead of 140%) do not trigger a release of additional allowances when the Capacity is halved from 400 to 200 mio. EUAs.

OUTLOOK AND POLICY SEQUENCING

COM's proposal means well, yet it fails to provide an effective tool to stabilize the market or to guard against harmful price fluctuations. It envisions two instruments charged with supply interventions based on quantity (MSR-1 and -2) and price triggers (Art. 29a and 30h) which pursue different aims. The former shall increase resilience of the market by correcting for fluctuations in fundamentals while the latter shall stabilize prices by curbing speculation in the respective ETS. Even assessed separately, both approaches are dysfunctional.[6]

Together, they make matters even worse due to incoherence in their interactions. Most likely, any number of allowances added due to an intervention based on Art. 29a will be automatically removed by the MSR, unless the latter has already stopped withholding allowances from the market (Gerlagh et al. 2022).

With the current reform cycle coming to a close, it becomes apparent that EU policy makers will not improve the EU ETS on a structural level. If COM's proposal is implemented, it will set the design of the system for the years to come, keeping the flawed MSRs and adding the insufficient mechanisms of Articles 29a and 30h. However, it is of crucial importance to start preparing a sequence of improvements to the EU ETS for the following reform cycle (Pahle et al., 2018). For the Green Deal to become a success, creating a coherent and efficient framework for carbon pricing is a vital ingredient. Further developing the EU ETS towards an economy-wide market is a promising way towards this end (Edenhofer et al., 2021). The PCM can play an enabling role to bring ETS-1 and ETS-2 into an institutional setting where the goal of a universal carbon price comes into reach.

Firstly, the PCM is a potent mechanism to stabilize the price path and make the system more resilient against anticipated and unanticipated demand shocks and by means of expectation stabilization, to dampen short-term fluctuations and speculative motives.

Secondly, as the former problem of oversupply has been dealt with, the PCM can take over the MSR's activity as well and inherit its holdings. A smooth transition towards the flexible and responsive design of the PCM can be achieved by

6 For assessments of the MSR see Bruninx & Ovaere (2022), Gerlagh et al. (2021, 2022) and Perino et al. (in press).

phasing out the MSR's quantity-trigger – the PCM is a fully-fledged and superior evolution of the MSR.

Thirdly, for the sake of price convergence to harmonize ETS-1 and ETS-2 and possibly other systems, e.g. for linking, the PCM can be adjusted to allow for different price path trajectories. Price levels will still be driven by the cap and overall supply controlled by the linear reduction factors of the respective ETS. For future endeavors towards a "climate club" under Article 6 of the Paris Agreement, moving to the PCM will adapt the EU ETS to all other existing ETS that feature price-based stabilization mechanisms.

Fourthly, the PCM is a symmetric instrument which addresses concerns on both sides to the political argument. Those favoring an emergency brake for escalating prices can rely on the PCM to inject allowances to slow down the market. On the other hand, those concerned about low prices and lacking incentives for decarbonization can rely on the PCM to guard against price slumps and stabilize expectations of a rising price path. Moreover, as the PCM is supplied by holdings from the MSR, the overall cap can be kept.

All in all, the PCM is capable to take over the steering wheel of supply management in the EU ETS or it can remain as an emergency brake in the background – this is open to future reform cycles. In our view, it is a good step forward in sequencing policy change towards the short-term flexibility and long-term stability needed for reaching the Green Deal's targets.

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ANNEX A: ORIGINAL LEGAL TEXTS

Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC (version of 1 January 2021)

Article 29a – Measures in the event of excessive price fluctuations
1. If, for more than six consecutive months, the allowance price is more than three times the average price of allowances during the two preceding years on the European carbon market, the Commission shall immediately convene a meeting of the Committee established by Article 9 of Decision No 280/2004/EC.
2. If the price evolution referred to in paragraph 1 does not correspond to changing market fundamentals, one of the following measures may be adopted, taking into account the degree of price evolution:
(a) a measure which allows Member States to bring forward the auctioning of a part of the quantity to be auctioned;
(b) a measure which allows Member States to auction up to 25 % of the remaining allowances in the new entrants reserve.
Those measures shall be adopted in accordance with the management procedure referred to in Article 23(4).

Decision (EU) 2015/1814 of the European Parliament and of the Council of 6 October 2015 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and amending Directive 2003/87/EC

Article 1 – Market Stability Reserve
7.In any year, if paragraph 6 of this Article is not applicable and measures are adopted under Article 29a of Directive 2003/87/EC, 100 million allowances shall be released from the reserve and added to the volume of allowances to be auctioned by the Member States under Article 10(2) of Directive 2003/87/EC. Where fewer than 100 million allowances are in the reserve, all allowances in the reserve shall be released under this paragraph.

Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757 (COM(2021) 551 final; 14 July 2021)

Article 30h – Measures in the event of excessive price increase
1. Where, for more than three consecutive months, the average price of allowance in the auctions carried out in accordance with the act adopted under Article 10(4) is more than twice the average price of allowance during the six preceding consecutive months in the auctions for the allowances covered by this Chapter, the Commission shall, as a matter of urgency, adopt a decision to release 50 million allowances covered by this Chapter from the Market Stability Reserve in accordance with Article 1a(7) of Decision (EU) 2015/1814.
2. Where, for more than three consecutive months, the average price of allowance in the auctions carried out in accordance with the act adopted under Article 10(4) is more than three times the average price of allowance during the six preceding consecutive months in the auctions for the allowances covered by this Chapter, the Commission shall, as a matter of urgency, adopt a decision to release 150 million allowances covered by this Chapter from the Market Stability

ANNEX B: PROPOSED AMENDMENTS FOR A NEW ARTICLE 29A IN ETS-1 (ADAPTABLE FOR 30H):

Reserve in accordance with Article 1a(7) of Decision (EU) 2015/1814.

NEW ARTICLE 29A OF DIRECTIVE 2003/87/EC

(1) The "ratio of real allowance prices" is the average allowance price in the auctions carried out in accordance with the act adopted under Article 10(4) in the previous quarter divided by the average allowance price in the auctions carried out in accordance with the act adopted under Article 10(4) in the corresponding quarter of the previous year minus the rate of inflation in the EU.

Explanation: This is a well-defined, transparent and economically relevant measure of price change. A quarter is sufficiently long to avoid being vulnerable to manipulation in a single allowance auction and sufficiently short to allow for a quick response to market turbulences. The rate of inflation as measured and published by Eurostat should be used to reflect real market prices.

(2) The "current annual cap" is the number of allowances to be issued over the current calendar year without considering the allowances added or removed due to Article 1(5) to Article 1(7) of Decision (EU) 2015/1814.

Explanation: Reference to the annual cap allows to condition the size of the intervention to the current size of the market. This needs to be decoupled from TNAC-triggered MSR intervention and hence the specification.

(3) If the "ratio of real allowance prices", as defined in paragraph 1, exceeds "PRICE CHANGE THRESHOLD" percent, the volume of allowances auctioned in the subsequent quarter shall be increased by [insert calculation here or refer to equation in Annex] the "ratio of real allowances prices" as defined in paragraph 1 minus one, multiplied with the BASE RATE times the "current annual cap" defined in paragraph 2. The quantity of allowances defined in the previous sentence shall be released from the Market Stability Reserve in accordance with Article 1(7) of Decision (EU) 2015/1814.

Explanation: The Price Change Threshold (e.g. 20%) is a key 'control' parameter. It specifies the minimum real price change that triggers an intervention by this mechanism. The larger this threshold, the more the mechanism becomes an 'emergency' tool. The smaller it is, the more common interventions will be. The Base Rate is the second key 'control' parameter of this mechanism. It specifies the size of the intervention, i.e. the percentage of the current annual planned cap that is added (removed) in case the price doubles (halves) in one quarter. Note, that if the price change persists, then the same quantity will be added for four subsequent quarters. The higher the Base Rate, the more responsive is the allowance supply to price changes and the more stable the price path.

(4) If the "ratio of real allowance prices", as defined in paragraph 1, undercuts minus "PRICE CHANGE THRESHOLD" percent, the volume of allowances auctioned in the subsequent quarter shall be decreased by [insert calculation here or refer to equation in Annex] one divided by the "ratio of real allowances prices" as defined in paragraph 1 minus one, multiplied with the BASE RATE times the "current annual cap" defined in paragraph 2. The quantity of allowances defined in the previous sentence shall be placed in the Market Stability Reserve in accordance with Article 1(7) of Decision (EU) 2015/1814.

Explanation: This is a crucial addition as it creates symmetry. This increases market stability and ensures that interventions are reversible.

NEW PARAGRAPHS FOR ARTICLE 1 OF DECISION (EU) 2015/1814

5a) Unless otherwise decided in the first review carried out in accordance with Article 3, from 2023 onwards, allowances held in the reserve above CAPACITY million allowances shall no longer be valid.

Explanation: Capacity is the third 'control' parameter of the mechanism. It specifies the maximum number of allowances in the reserve that are available for interventions aiming at reducing the speed of price increases. The higher Capacity, the better the mechanism is able to accommodate large shocks. Note that Capacity and Base Rate should be considered together.

(7) The volumes to be released from or placed in the reserve in accordance with Article 29a of Directive 2003/87/EC shall be added to or withheld from the volume of allowances by the Member States under Article 10(2) of Directive 2003/87/EC within a period of three months from the entry into application of the measure adopted pursuant to Article 29a of Directive 2003/87/EC. Where fewer than the number of allowances to be released in accordance with Article 29a of Directive 2003/87/EC are in the reserve, all allowances in the reserve shall be released under this paragraph.
Any adjustment of the auctioning volume under this paragraph adds to any adjustment made under paragraphs 5 and 6 of this Article.

Explanation: This amendment specifies the period within which the intervention takes place in line with Art. 1a(7) proposed by COM. Additivity with other interventions of the MSR ensures that interventions based on Art. 29a use the same baseline reflected in the market price. Moreover, if interventions by paragraphs 5 and 6 would be superseded by interventions by this paragraph, then the net additional impact on auctioned allowances could be the opposite of what is intended by Art. 29a. This happens when the intervention superseded is larger than the one replacing it.

ANNEX C: EQUATIONS OF THE PCM

$\mathbf{Q}_t$ is the most recent completed quarter, $\mathbf{Q}_{t-4}$ is the corresponding quarter in the previous year

PRICE INCREASE: Number of allowances released from the MSR:

$$BASE\ RATE \cdot Cap \cdot \left(\frac{average\ price\ Q_t}{average\ price\ in\ Q_{t-4}} - inflation\ rate - 1\right)$$

PRICE DECREASE: Number of allowances placed in the MSR:

$$BASE\ RATE \cdot Cap \cdot \left(\frac{1}{\frac{average\ price\ Q_t}{average\ price\ in\ Q_{t-4}} - inflation\ rate} - 1\right)$$

SINGLE EQUATION VERSION:

$$Sign(avg.p\ Q_t - avg.p\ Q_{t-4}) \cdot BR \cdot Cap \cdot \left(\left(\frac{avg.p\ Q_t}{avg.p\ Q_{t-4}} - inf.rate\right)^{Sign(avg.Q_t - avg.Q_{t-4})} - 1\right)$$