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Tricky trade-offs: challenges for the future of the EU ETS



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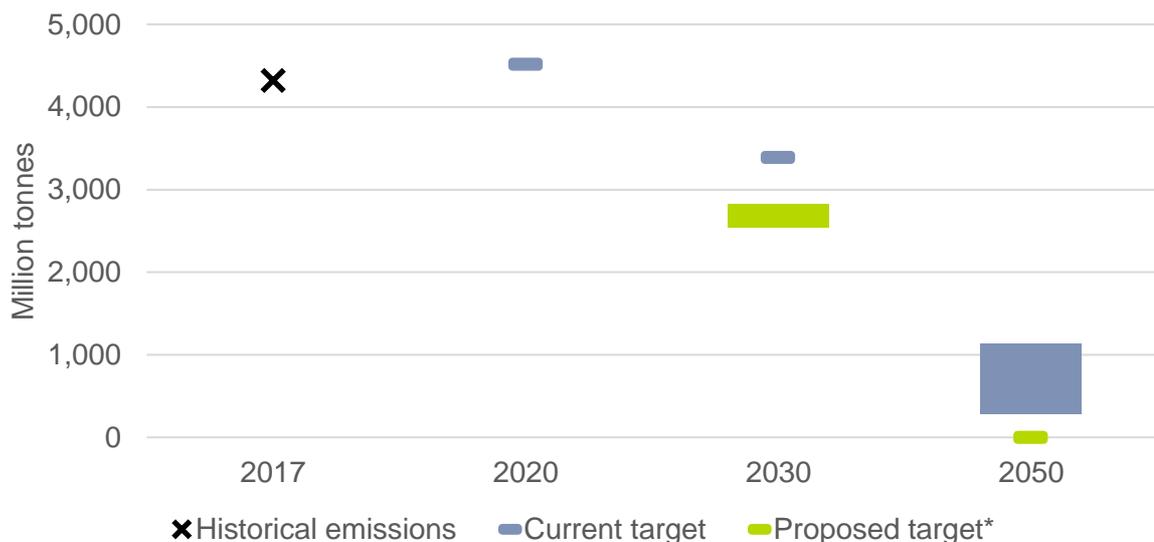
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1. INTRODUCTION

Since 2005 the European Union's Emissions Trading Scheme (EU ETS) has been a policy instrument central to how Europe addresses climate change. With the launch of the European Green Deal,¹ political discussion around that climate policy increasingly focuses on strengthening decarbonisation targets. Against this background, does Europe need to rethink the role its carbon market plays and how it operates?

Figure 1 – Key figures in EU climate policy



Notes: The current 2050 target and the proposed 2030 are expressed as ranges. The proposed targets have been endorsed, though not formally adopted, by the European Commission, the European Parliament, and partially² also the European Council. The proposed target in 2050 also includes a negative emission contribution from land-use, land-use change and forestry.³

As Figure 1 shows, the ambition revisions under discussion are considerable. The 2030 target, only ten years away, would move from 40% relative to 1990 to 50-55%; likewise the 2050 target would explicitly embrace climate neutrality, as opposed to a quite wide range of acceptable outcomes. However, as the European Commission develops by summer 2021 a formal Proposal on how to change the ETS, some crucial additional questions that it must consider include:

¹ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

² Of the 27 current Member States, only Austria, Denmark, Finland, France, Italy, Latvia, Luxembourg, the Netherlands, Portugal, Slovenia, Spain and Sweden have formally called for the proposed 2030 target so far.

³ Without the LULUCF contribution, the proposed 2050 target is broadly in line with the ambitious end of the range under the current target.



- Should the scope of activities/sectors covered by the ETS be expanded and, if so, how?
- Will the current stability mechanism, the Market Stability Reserve (MSR), still be required to address concerns over the strength of carbon price signals?
- Does Europe need new carbon leakage measures to protect the competitiveness of its industry?

Addressing all the above questions in a single policy package is complex. Based on historical precedent, the European institutions will wrestle with these questions for at least two years after the Commission publishes its Proposal, with the legal package unlikely to be finalised before the second half of 2023. To shed some initial light on these issues and inform the relevant stakeholders, this AFRY White Paper explores at a high level the implications for the energy sector stemming from four strikingly different options for future carbon market design.

2. DIMENSIONS OF CHANGE

2.1 Scope of the scheme

As can be seen in Figure 2, the ETS covers less than half of Europe's greenhouse gas emissions, with emissions associated with other areas – the effort sharing regulation (ESR) sectors⁴; land use, land use change and forestry (LULUCF); and, international bunkers⁵ – being addressed separately.

This distinction has arisen for several reasons, including perceptions about decarbonisation costs, technical challenges around measurement⁶, and governance conflicts. However, with stronger climate ambition requiring much greater decarbonisation on an economy-wide basis, serious consideration is being given to consolidating several of these activities into the EU ETS. There are several rationales for this:

- **Clear governance arrangements:** Responsibility for maritime and most aviation emissions falls outside the current European climate governance framework.
- **Increased credibility of commitment:** The ETS regime has explicit financial incentives to comply, which are more transparent and certain than the non-compliance measures in the ESR sectors.
- **Economic efficiency:** There have already been concerns around distortions caused by overlapping policies across sectors; a consolidated emissions trading scheme would improve efficiency.

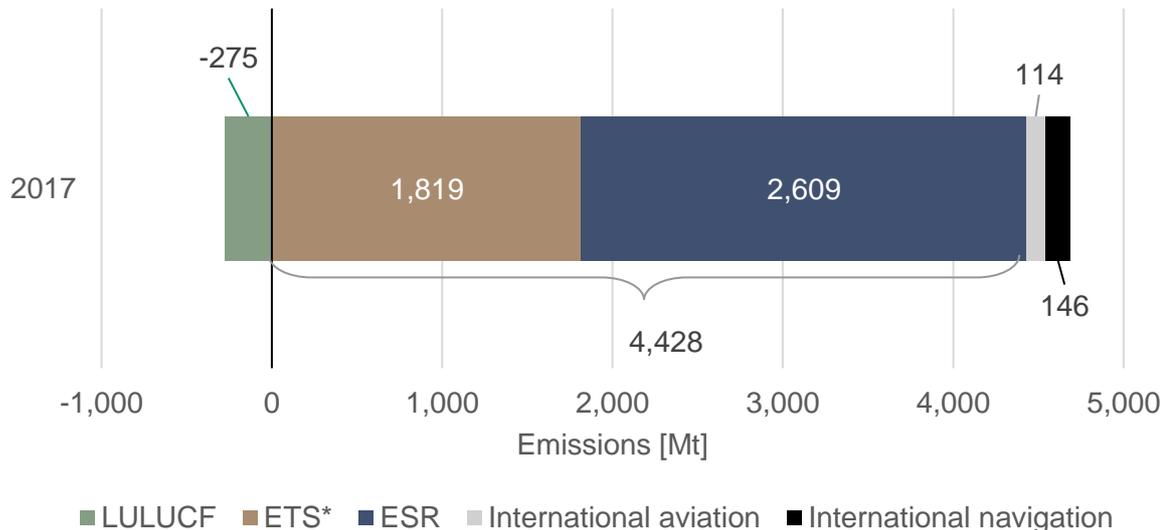
⁴ Broadly: small-scale heat production, non-aviation transport, agriculture, and waste.

⁵ Aviation among EU Member States is regulated by the EU ETS.

⁶ This refers specifically to the appropriate measurement of emissions associated with LULUCF.

- **Convergence of costs and prices:** Abatement costs for non-ETS sectors are becoming more comparable with projected ETS prices, reducing the earlier rationale for separate mechanisms.

Figure 2 – Composition of 2017 EU greenhouse gas sources and sinks by individual activity pillars



Note: The ETS includes all intra-EU aviation, removing the respective category from international aviation.

There are broadly three options for how the current ETS and non-ETS sectors will be integrated in the future – all of which come with a series of important design choices:

- **Direct ETS scope expansion:** This option adds the new sectors to the trading scheme, thus increasing fundamental demand, and also adjusts the overall cap by issuing additional allowances against the new sectors, thereby revising the supply side as well. This raises two questions:
 - **How to determine the ETS cap adjustment?** The option selected will have a direct impact on the tightness of the carbon market and therefore the carbon price. Historically this has been done in two ways: The 2013 scope change of the stationary segment placed the newly integrated activities under the same **tapered cap** as all other previously regulated sectors, with a unique linear reduction factor (LRF). By contrast, when aviation was integrated into the ETS in 2012 a **flat cap** was devised, made up of allowances accessible only to aviation operators.⁷ Further contentious points include the level at which the new sectors' cap starts, and how quickly it falls in relation to that of the old sectors.

⁷ This flat cap remains in operation until 2020, after which it will start falling at the same LRF as the stationary segment. Practically, given the ambition to achieve climate neutrality, the question is for how long Europe will seek to accommodate the new sectors with a relatively generous flat cap.

- ***Will the new sectors require protection against carbon leakage?***
 By default all allowances making up the ETS cap are auctioned, but a considerable share thereof are traditionally set aside to be allocated for free to sectors exposed to international competition (see section 2.3). Although from the point of view of price determination this share is theoretically not a market fundamental of primary importance, it is of keen interest to both Member State treasuries (because a higher share means forfeited treasury revenues) and regulated operators (because more free allowances means less direct exposure to the carbon price).⁸
- **Indirect linking:** This option adds only demand from new sectors to the carbon market, without issuing any allowances on the supply side. This approach expands upon the current practice that allows some Member States to surrender a modest volume of EUAs against their ESR emissions.⁹ Such a mechanism would make the trade-off between ETS and non-ETS sector decarbonisation more transparent, making the limits on the syphoning off of EUAs the main contentious question of this design.
- **Virtual allowances:** Here the carbon market does not actually experience either new demand or new supply. Because of this, it is only the old sectors that are involved in the formation of the ETS carbon price. Actors within new sectors simply must pay this price – as if they were purchasing actual allowances, but without having contributed to its formation.

2.2 Stability mechanisms

The original ETS design had no automatic adjustment mechanisms, so inflexible oversupply eventually led to low prices that did not incentivise decarbonisation. In response to this problem, the EU introduced in 2015 the Market Stability Reserve (MSR). This mechanism created supply-side adjustments to keep the cumulative surplus of EUAs, i.e. the difference between total supply and total demand, within a pre-defined desirable range. Practically, in the event that the cumulative EUA surplus becomes too great, allowances from annual auctions are diverted into an inactive reserve, with the prospect of releasing them in the future if the market ever became too tight.

Since strengthening the MSR in 2018¹⁰, carbon prices have risen from around EUR 8/tCO₂e to EUR 20-30/tCO₂e currently. Off the back of that development, by the end of 2018 generation in coal plant had contracted by a notable 29% relative to the start of Phase 3 in 2013.

⁸ A prominent aspect of this question affects the Brexit process, given the history of fuel smuggling by criminal organisations across the Irish border. Similar issues may crop up along all border areas of the EU.

⁹ This option is currently open only to the Member States facing the steepest ESR decarbonisation objectives, limited to an EU-wide total of 100 million EUAs for the 2021-2030 period.

¹⁰ This involved doubling its intake rate for the first five years of operation, and allowing it to invalidate any allowances in the Reserve above a constantly diminish ceiling.

The EC is required to review the MSR in 2021. With the increased ambition on climate action and anticipated tightening of the carbon market, wider carbon market reforms may offer three alternatives:

- **Remove the MSR:** If the enhanced ambition makes low prices no longer a concern, then is there a need for such a mechanism at all?
- **Replace the MSR:** A mechanism that is not focused on the market surplus but on the actual carbon price trajectory may be more politically desirable in the context of increased ambition. This would address concerns that the existing emergency mechanisms rules for injecting allowances are too vague, and that the current design leads to excessive price volatility. Such an alternative design may include explicit price ceilings, floors or collars.¹¹
- **Refine the MSR:** Retain the scheme and adjust some of the key metrics that govern its operation.
 - **Basic overhaul:** This is the primary consideration of the 2021 review, which will look at the surplus range and the flow rate between the market and the reserve.
 - **Governance overhaul:** An entirely differently designed MSR could focus on EUA surpluses that result from overlapping climate-policy instruments.¹² These instruments¹³ reflect the presence of multiple policy priorities at both the European and national level. However, their unfortunate side-effect is to force the carbon market to accept abatement from expensive decarbonisation options before cheaper ones. This makes the decarbonisation of the economy overall more expensive. As AFRY has proposed in the past¹⁴, EU climate policy should include a mechanism to sterilise the effects of such instruments. This would allow Europe to implement high-profile policies without negatively affecting the carbon market.

¹¹ Emission trading schemes from North America, such as the RGGI or WCI markets, apply such measures.

¹² This design option is inspired from the RGGI market, which has so far implemented three separate “interim adjustments”. These adjustment reduce the “base cap” of future years by the amount of allowances in privately held accounts banked forward from past years, allowing participating States to pursue also other policy objectives that would otherwise interact with their carbon market.

¹³ The renewable electricity policy instruments imposed so far by Member States, who retain sovereignty in energy matters, have put well-documented downward pressure on the European carbon price. Further high-profile examples include the energy efficiency directive at the EU level, emission intensity targets for the manufacturers of cars, vans and heavy-duty vehicles, and various Member States’ coal phase-out plans, etc.

¹⁴ <http://www.poyry.co.uk/poyry-develops-mechanism-protect-eu-emissions-trading-system-overlapping-policies>

2.3 Carbon leakage

Where EU producers are competing against imports from markets with a lower carbon price (or even no carbon price whatsoever), they may experience unfair, adverse competitiveness effects. At present, this is counteracted by allocating allowances for free to installations in sectors that may find it more difficult to pass on the carbon price to their consumers.¹⁵

However, as the overall cap tightens, it becomes increasingly difficult to maintain free allocation. Free allocation is doled out each year, based on EU-wide product benchmarks expressing the emissions intensity of the 10% most efficient installations within a given sector, multiplied by a grandfathered installation-specific historical activity level. Yet if the amount of this 'preliminary free allocation' exceeds the amount of allowances available after each year's auctions have been accounted for, industrial players face uniform haircuts across the board: As of 2020, this 'cross-sectoral correction factor' distributes only 78% of the preliminary free allocation. Although some measures were implemented to avoid the haircut during 2021-2030, it becomes increasingly unavoidable as the cap continues falling – especially in the context of added medium- and long-term climate ambition.

For this reason, and in response to several further inefficiencies¹⁶, some stakeholders have suggested a phase out of free allocations, to be replaced with a regime of so-called border adjustment measures (BAMs). This regime, rather than protecting domestic actors from the carbon price, would instead expose importers to it. There are three main alternatives available:

- Maintain the **free allocation regime**, but accept that final allocation across some, or all, sectors would eventually have to fall;
- introduce some form of **BAMs** to replace the free allocations; or
- create a **hybrid** scheme that keeps free allocation for some sectors and BAMs for others where there is a well-established approach to measuring carbon content of the goods (e.g. power and cement).

The practical implementation of a BAM regime would involve importers having either to purchase 'virtual allowances' (to pay the same carbon price as EU industrial actors), or to submit actual EUAs to cover the carbon content of goods (where this can be credibly measured). Because this latter option essentially creates a new form of EUA demand, it opens up the reasonable question whether this is not a form of scope change, requiring a commensurate change in the ETS supply.

¹⁵ The only sector not receiving free allocation currently is power generation, because the EUA price is passed through to consumers through electricity wholesale markets.

¹⁶ Examples include distributional inefficiency in comparison to auctions, and the distortion of competition between products covered by free allocation and those that are genuinely low- or zero-carbon.

Either way, careful diplomacy is needed to avoid triggering potentially costly frictions with other major trade blocs. Furthermore, the design should avoid unintended consequences on the mechanics of price formation.¹⁷

3. OPTIONS FOR A NEW ETS

With various options available under each dimension of ETS reform, the range of possible future designs is wide. Ultimately the decision will consider the alternatives' impact on carbon price efficiency, distributional effects, and practical costs of implementation. To illustrate this, we outline below four potential options for a 'new' ETS and briefly assess their impact against these criteria.

3.1 Option design

The four options below, summarised in Table 1, showcase different possible ways of changing ETS – without implying that any of them is particularly more likely than the others:

- **Status Quo:** This design entails minimum effort to change the current ETS design. In line with existing policy, the current boosted MSR intake rate is allowed to expire, and free allocation continues with unavoidable haircuts. The ETS scope changes to include intra-EU maritime emissions with a generous flat cap. Decarbonising heating and overland transport proceeds through national non-ETS policies, but governments occasionally cancel EUAs from auctions if emissions do not fall quickly enough – setting up a form of indirect linking between the ETS and non-ETS sectors.
- **Indirect Linking:** Here governments exploit the ETS to the fullest to deliver most of the decarbonisation of the European economy. Reluctant to impose any forceful domestic policies on heating and transport, governments instead implement a more robust form of indirect linking, featuring a bulk cancellation schedule for auctionable EUAs. Additional changes to stimulate ETS emission cuts include integrating the maritime sector with a tapered cap straightaway, strengthening the MSR, and imposing free allocation haircuts to raise domestic industries' exposure to the carbon price.
- **Cautious Reform:** In a circumspect revision of the ETS, all new sectors are integrated directly into the ETS through scope change, featuring a tapered cap. However, to prevent price escalation, the MSR's ability to constrain future supply is weakened. BAMS are introduced only where administrative hurdles are minimal, relying on a system of virtual allowance purchases.
- **Quantum Leap:** This radical revision of the ETS goes beyond C by replacing the MSR with a price-driven mechanism, and substituting free allocation entirely with a BAMS regime featuring virtual allowances.

¹⁷ For example, whether increases in auctioned allowances would result in higher releases from the MSR that would dampen carbon prices.

Table 1 – Characteristics of future ETS design options

Design features	Status Quo	Indirect Linking	Cautious Reform	Quantum Leap
Sector integration ¹⁸	Indirect EUA use for domestic sectors, direct integration with flat cap for maritime sector	Indirect EUA use for domestic sectors, direct integration with tapered cap for maritime sector	All sectors directly integrated with tapered cap	All sectors directly integrated with tapered cap
Market stability mechanism	MSR continues unchanged	MSR refined to strengthen intakes	MSR continues unchanged, except for elimination of invalidation function	MSR replaced with a price-driven mechanism
Carbon leakage measures	Free allocation (in full for prominent sectors, haircut otherwise)	Free allocation haircut for all	BAMs for feasible sectors, otherwise free allocation haircut	BAMs; no free allocation

3.2 General design implications

It is commonly stated that the ETS already includes the sectors that are cheapest to decarbonise: Power and large-scale heat would decarbonise before industry, whose emissions would in turn fall before those of aviation. The experience of including aviation into the EU ETS already shows that integrating a new sector does not guarantee that its emissions will fall. The effects of integrating further sectors depends on the specifics of each option's design, as well as on the presence of overlapping policies.

¹⁸ Small-scale heating, overland transportation, maritime navigation.

It may well be that the integration will affect the old ETS sectors first, rather than heating and transport. The immediate first-order effects¹⁹ of integrating them into the ETS, be it through indirect linking or outright ETS scope change, depend on how the balance between their emissions and the EUA supply issued to them shifts the carbon price. This depends not only on design choices when issuing the new sectors' caps (see section 2.1), but also on the set-up and calibration of the market stability mechanism (see section 2.2). There are several important distributional ramifications to consider:

- **Across sectors:** For the short- and medium term the sector most likely to see the most impact is power generation and large-scale heat. Even if the new sectors are integrated under the tightest possible circumstances, this old sector is simply first in the merit order.
- **Across EU Member States:** If the power market experiences material consequences, the sensitivity of electricity consumers in poorer Member States might become a relevant political issue.²⁰
- **Across the world:** The experience of "Stop the Clock" during the inclusion of international aviation suggests that the reaction of non-EU governments must be taken into account. This will be especially relevant in the case of integrating international navigation and establishing BAMs.

There is also no guarantee that the fuller the integration of heating and transport into the ETS, the more cost-effective decarbonisation would be. Adding new sectors only raises the possibility that regulators, at the European or national levels, would interfere with efficient price formation through new kinds of overlapping policies. Possible examples include phase-outs of internal combustion engine, or subsidies to heat pumps. Europe continues to need an overall governance mechanism to sort out such interference.

3.3 Individual option assessment

When making design choices, there will inevitably be trade-offs across multiple policy objectives. In comparing our proposed options, we have considered the following areas of impact:

- **Strength of carbon price signal:** All options affect sectors' exposure to the carbon price, be it through the relative tightness of the carbon market (both through the way in which allowances are issued to new sectors and the operation of any stability mechanism) or through carbon leakage measures.

¹⁹ Second-order effects may arise from the demand and prices for new energy vectors (electricity, biofuels, e-fuels, or hydrogen) relative to those conventionally used in heating and transport (natural gas, traditional biomass, peat, gasoline, diesel, etc.).

²⁰ Over time this issue may become less salient, as the number of hours when thermal generator set the marginal price diminishes itself over time and eventually wholesale power prices start falling.

- **Decarbonisation incentives:** This criterion assesses whether the option would affect the speed of decarbonisation and the adoption of negative emission technologies.
- **Protection of international competitiveness:** The carbon leakage regime affects how EU industrial sectors' competitive position is impacted.
- **Regulatory implementation:** This criterion captures how difficult it will be to implement the required changes.

Table 2 – Potential impact of future ETS options

Impact criterion		Status Quo	Indirect Linking	Cautious Reform	Quantum Leap
Strength of price signal					
Decarbonisation incentives	Energy utilities				
	Industry & aviation				
	New sectors				
Protection of international competitiveness					
Regulatory implementation	Sector integration				
	Carbon leakage				

Note: Full Harvey balls show the strongest impact when full, and weakest when hollow. Harvey balls for regulatory impact are depicted in red to reflect relative difficulty to set up administrative framework, whereas elsewhere the colour blue represents positive impact.

Table 2 provides a high-level qualitative overview of the expected impacts of each option. In detail:

- The **Status Quo** option imposes only limited change in the scope and operation of the ETS. As such, it is relatively easy to implement, but it also has minimal additional benefits to overall decarbonisation. Including the maritime sector by issuing a flat allowance volume dampens the carbon price signal. This option also may prove challenging for industry in the longer-term, because it does not address how a falling cap would eventually impose haircuts on benchmark-based free allocation.

- Under **Indirect Linking** we find the utmost pressure to decarbonise on the ETS. Prices escalate rapidly, with most of the emission cuts achieved in power, and perhaps later in industry. There is very little actual decarbonisation in heat and transport – because neither are these sectors under the ETS, nor do governments have policies to address them. To counteract this lack of action, governments must have large volumes of allowances available for cancellation, which they procure by diminishing the pot for free allocation – thus protecting European competitiveness less. However, this option is relatively easy to implement, because it only builds beyond administrative precedent by adding a relatively straightforward cancellation schedule.
- **Cautious Reform** directly includes new sectors through challenging tapered caps, but moderates the net effect by revising the MSR to make less severe cuts to long-term supply. The decarbonisation of heating and transport would probably start only once the currently covered sectors have exhausted their cheapest options. Integrating more sectors directly into the ETS, along with developing and implementing a WTO-compliant BAM regime, even for the easiest sectors, makes this option significantly more challenging than B.
- Implementing the **Quantum Leap** keeps features the same scope change as C, but does not weaken the MSR. Instead, it keeps extreme price escalation at bay by replacing the MSR with a price-driven instrument. Depending on the width of the price collar and/or any new measures to contain surpluses driven by overlapping policies, there may well be more pressure to decarbonise all ETS sectors than under any other option. Applying the BAM regime to all sectors affords maximum protection to European industrial competitiveness, but makes this option the most administratively challenging to set up and implement.

4. WRAP-UP

As we have shown above, there are several important trade-offs that the EU must manage when calibrating the ETS for the future. The pieces of the puzzle interact with one another, with complex and wide ranging consequences for the carbon price and the energy sector across Europe. The ETS has been at the heart of the EU's climate instruments for over 15 years. To stay there it will need to adapt to the challenges of the next phase of decarbonisation. Now is the right time to ask what form of ETS is best for Europe's environmental and economic ambition? The EU and its Member States have not answered this yet and AFRY will continue to monitor the debate and use its policy and market expertise to assess the implications for governments, consumers and businesses.



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