Final Stage Impact assessment

Title:	**UK Emissions Trading Scheme: Future markets policy**
Type of measure:	Secondary legislation
Department or agency:	Department for Energy Security and Net Zero
IA number:	DESNZ024(F)-25-IDET
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1. Summary of proposal

The proposal is to adjust the Auction Reserve Price (ARP) and to leave the other market mechanisms unchanged for the standalone UK Emissions Trading Scheme (UK ETS). The chosen approach is to apply an inflation-based increase to the current ARP (from £22 to £28) and then to continue to account for inflation by applying an annual increase each year. This approach would only apply in the context of a standalone UK ETS scheme.

2. Strategic case for proposed regulation

The UK ETS aims to drive economically efficient decarbonisation. The UK ETS Authority responsible for the UK ETS is formed of the UK Government, Scottish Government, Welsh Government and the Department of Agriculture, Environment and Rural Affairs in Northern Ireland.

The Authority has reviewed the current ETS markets policy which was established at launch of the scheme. The Authority's aim was to determine whether this policy is still fit for purpose and remains effective in managing the risks faced by the scheme now it is established and is maturing. The Authority wanted to ensure that the existing market mechanisms maintained stable and effective market conditions that will continue to incentivise decarbonisation in the traded sector. In other words, the expected impact is continued efficient, effective decarbonisation.

Market stability mechanisms, in the form of Supply Adjustment Mechanisms (SAMs), are a component of ETS design that, if constructed appropriately, can help to increase the economic efficiency of an ETS. They achieve this by stabilising prices in the face of economic shocks.

The Authority identified three risks that markets policy should be designed to address for the maturing standalone UK ETS scheme:

- Risk 1: Demand shift with long-term impacts
- Risk 2: Sudden, significant and sustained price decrease
- Risk 3: Sudden, significant and sustained price increase

The Authority considered these risks to impact on an efficient decarbonisation path and therefore to need mitigation.

Different mechanisms were considered to counter such shocks; these were reviewed with regard to economic evidence (see Annex A) – including evidence from academia – modelling and consultation responses from stakeholders. This evidence was evaluated using Multi-Criteria Decision Analysis (MCDA). This document presents that evidence and analysis alongside the conclusions.

Linking the UK and EU ETS

Following the publication of the UK ETS Future Markets Policy Consultation in December 2023, it was announced at the 19 May 2025 UK-EU Summit that the UK and EU have agreed to work towards linking the UK ETS and EU Emissions Trading System (EU ETS) as set out in the Common Understanding[1].

There are many benefits to a linked scheme, including the creation of and access to a larger, deeper and more liquid carbon market. Overall, linking the UK and EU ETS would mean a cheaper path to net zero.

Linking has implications for the approach to managing risks identified in the Future Markets Policy Consultation. Any future link will require an effective and coordinated approach to market stability across both markets; as such, markets policy in a linked scheme will need to be determined through negotiations between the UK and EU.

This document sets out an assessment of the impact of changes to markets policy for the UK ETS. The changes reflect policy the Authority considers proportionate to make at this stage to support an effective standalone market while negotiations to link the UK and EU ETS are ongoing. **The Authority's decisions do not represent UK positions for the negotiations, and they also do not preclude any changes that may need to be made in the event that the UK and EU agree to link their schemes.**

This document sets out an assessment of the recommended changes to the UK ETS, which will only apply in the context of a standalone scheme, to ensure it remains fit for purpose

[1] UK-EU Summit – Common Understanding, 19 May 2025.

and is effective in managing the market risks faced by an established and maturing scheme. The changes are proposed to mitigate shocks which occur in the market leading to inefficient decarbonisation (see Annex A). These changes will maintain stable and effective market conditions that will continue to incentivise decarbonisation in the traded sector.

3. SMART objectives for intervention

The Authority's objectives for its review of market policy were stated in broad terms in the consultation and are described below. Details for how these objectives were interpreted and addressed, primarily through the tool of MCDA, are provided; see later in this section and in Annex B.

The objectives of the review:

- **To counter excessive, unexpected and destabilising upward and downward price and/or demand shocks in the market:** this objective was the main driver of the work and was restated as risks, as described earlier (Section 2). This was incorporated and effectively measured through use of the criteria, *Policy intent* and *Stable, long-term price and investment signal* in the MCDA.
- **To provide long-term reassurance to participants with a rules-based approach to any Authority intervention:** this objective was addressed under *Stable, long-term price and investment signal* and *Participant and market experience* in the MCDA.
- **To maintain the environmental integrity of the scheme:** to be achieved through not breaching the existing cap**:** this is ensured through the design of the scheme.
- **To be as simple and straightforward as possible to provide clarity for participants:** this objective was addressed under *Participant and market experience* in the MCDA. Also, when considering the longlist, which included measures with equivalent effects, the simpler measure was considered superior to a more complex one and existing measures were superior to new ones because participants already understood them.
- **To support price discovery and liquidity in UK ETS markets:** this objective was addressed under *Price discovery* in the MCDA. Also, through ongoing work measuring volatility and liquidity set out in the Evaluation published in 2023.[2]
- **A design that minimises the ability of any entity to 'game' the policy, and that reduces the potential for market abuse and activity that could significantly destabilise UK ETS markets:** this objective was addressed under *Market integrity* in the MCDA.

MCDA is a way of helping decision-makers rationally choose between multiple options where there are several conflicting objectives. The criteria that were used in the MCDA are given in Table 1 below.

[2] The evaluation was published here: https://www.gov.uk/government/publications/evaluation-of-the-uk-emissions-trading-scheme-phase-1

Table 1: MCDA criteria

Criteria	Description
Policy intent	How did the measure perform against the aims of mitigating against the three risks identified in the consultation, and providing cost-effective decarbonisation.
Stable, long-term price and investment signal	How did the measure perform against the aims of providing long-term price stability and providing a clear signal to invest (i.e. certainty and predictability of the mechanism).
Price discovery	How did the measure perform against the aim of allowing for price discovery.
Deliverability and feasibility	How did the measure perform against the aims of being legally deliverable, operationally deliverable, and consistent and deliverable with other Authority aims.
Participant and market experience	How did participants view the measure and how did it perform against the aims of providing simplicity and confidence to the market.
Market integrity	How did the measure perform against the aim of addressing the market being gamed through a market stability mechanism.

MCDA is referred to in Section 10 of the evidence base and described in further detail in Annex B.

4. Description of proposed intervention options and explanation of the logical change process whereby this achieves SMART objectives

The chosen approach is to amend the ARP in the scheme to bring it in line with inflation, to both increase it and to apply an annual increase each year. There are no other changes. This approach raises the price at which bids are made and therefore mitigates the impact of a sudden, significant and sustained price decrease and also mitigates an increased demand shift with long-term impacts. This approach would apply whilst the UK ETS remains a standalone scheme.

Supply Adjustment Mechanisms (SAMs)

A Supply Adjustment Mechanism (SAM) adjusts the number of allowances to be auctioned in certain years if predefined quantity or price triggers are activated.

- A quantity-triggered SAM is triggered if some measure of volumes, such as the total number of allowances in circulation (TNAC), crosses pre-defined thresholds. When these thresholds are crossed, the Authority can move allowances allocated for auction to the reserve or withdraw allowances from the reserve and auction those allowances.
- A price-triggered SAM is triggered if allowance prices cross pre-defined (in-year or annual) price thresholds. When these thresholds are crossed, the

Authority can move allowances allocated for auction to the reserve or withdraw allowances from the reserve and auction those allowances.

- Auction Reserve Price (ARP) is an in-year price-triggered SAM: Any bids in primary auctions below the ARP are not accepted, providing a minimum price in auctions. The ARP was introduced on the launch of the UK ETS as a transitional mechanism to ensure a minimum level of ambition and price continuity during the initial years of the UK ETS. Currently the ARP is £22.
- Cost Containment Mechanism (CCM) is an in-year price-triggered SAM: A CCM was introduced with the launch of the UK ETS. This currently means that if prices in the UK ETS exceed three times the average UK ETS price over the previous two years for six consecutive months, Authority intervention can be considered. Such intervention would be of the form of withdrawing allowances from the reserve and auctioning them.

This proposal to raise the ARP only was reached by:

- Approaching the longlist in two main stages: the first being reviewing options raised in the consultation as likely to be discounted[3] and the second being reviewing broad categories of a price-triggered SAM and a quantity-triggered SAM.
- The first stage of reducing the longlist involved considering the policy objectives and applying these to the options flagged at consultation stage as not favoured. This resulted in those options being removed. Participants had raised no concerns about discounting those options.
- The second stage of the longlist was applying the MCDA (see Table 1 earlier, Section 10 and Annex B) to the broad categories of price-triggered SAMs and quantity-triggered SAMs. This analysis concluded that a price-triggered SAM achieved higher scores for meeting the policy objectives and for the overall MCDA process.
- The shortlist then contained three broad options of price-triggered SAM (an annual price-triggered SAM, an adjustment to the within-year ARP, and an adjustment to the within year CCM).
- These options were assessed in the context of a standalone scheme, through MCDA, and then the Authority reviewed how this positioned while negotiations to link the UK ETS and the EU ETS are ongoing.
- The Authority concluded that, as negotiations to consider linking the UK ETS to the EU ETS are ongoing, substantial changes were not appropriate.
- Consequently, the Authority also concluded that the current CCM and an amended ARP balanced the need to address policy objectives for the standalone UK ETS whilst avoiding the implementation of larger or more complex changes, to allow for negotiations to take place.
- Given the decision to retain existing market stability mechanisms, the Authority made no changes to the reserve pot from which the CCM might draw allowances.

[3] These were flagged for consultation participants' information and consideration so that they could state if they considered these options were unfairly valued.

The UK ETS currently has an ARP of £22, which establishes a minimum price for which allowances can be sold at auctions. Bids below this price will not be successful at auction. There is no current adjustment for inflation to this price.

The increased ARP would be applied in the same way with bids below the price not being successful at auction. The annual increase would be applied each year, using the GDP deflator as published by the Office for National Statistics (ONS) and announced in advance of the year to which it applied.

5. Summary of long-list and alternatives

The longlist covered two categories of options that did not reach the shortlist.

- The first category was options discounted in the first round of consideration, following the close of the consultation, and
- the second was a further narrowing of broad options to a narrower shortlist.

The first category included some types of price-triggered SAM and other approaches detailed in the Analytical Annex[4] to the *Future Markets Policy consultation of the UK Emissions Trading Scheme* as options that were not favoured. These were named and described in the consultation to indicate to respondents that they had been considered and also to allow respondents the opportunity to raise any reasons for reconsidering them.

Those on the longlist in the first category received no support or interest from consultation respondents. Also, considering the measures qualitatively, they had no obvious advantages over those remaining on the list of options and many were also considered unfamiliar to market participants and therefore did not meet the policy objective of providing clarity.

Those in the first category were (see pages 24-27 of the Analytical Annex for more details):

- **Absolute or temporary price floors triggered by the Authority buying up allowances.** These were rejected as providing no clear improvement over the ARP and representing a substantial level of interaction from the Authority for no clear benefit over existing methods.
- **Emissions Containment Reserve (ECR), which is a policy mechanism designed to automatically reduce the allowance supply when the price of allowances falls below a trigger price.** This was rejected on the grounds of being no clear improvement over an amended ARP.
- **Reverse Cost Containment Mechanism which would work in a similar way to the CCM, but for low prices.** Again, this was rejected on the grounds of having no clear improvement over an amended ARP.
- **Absolute price ceiling triggered by the Authority offering additional allowances at the price ceiling.** This was rejected as providing no clear improvement over the CCM as it involved needing additional allowances regardless of whether there was a reserve and no reason for moving away from the trigger levels the CCM already used. Also, it

[4] This can be found in English and Welsh here: https://www.gov.uk/government/consultations/uk-emissions-trading-scheme-future-markets-policy

was considered an unnecessary level of interaction from the Authority because of the need for additional allowances.

- **Cost Containment Reserve which has a pre-determined trigger price and, if it is reached, a pre-determined volume of allowances is released into the market to reduce prices.** This was rejected as providing no clear improvement over the CCM for similar reasons to the price ceilings.

There were two broad categories of items on the remaining longlist of the consultation. The first was to introduce either an annual quantity-triggered SAM or an annual price-triggered SAM. The quantity-triggered SAM would operate by use of some measure of quantity, such as the TNAC, to compare to thresholds whilst the price-triggered SAM would consider comparing UK emissions allowance (UK Allowance or UKA) price to specific price thresholds. Both measures would then adjust supply of allowances, in the form of auction volumes, if thresholds were triggered. The quantity-triggered SAM had been the minded-to position at consultation. The second category was to review the two in-year price-triggered SAMs in operation: the ARP and the CCM.

The Authority used MCDA to evaluate these two categories for a standalone scheme. It then considered the introduction of negotiations to link the UK and EU ETS before moving to its conclusion.

Informing the MCDA was evidence ranging from economic literature to consultation responses from stakeholders. Evidence from academic papers,[5] including discussions with some of their authors, on addressing the policy intent indicated that introducing a quantity-triggered SAM, the previous minded-to position, might not be the most effective way of addressing some types of demand shift or price trend change. Consequently, quantity-triggered SAM scored lower than the price-triggered SAM options (annual, ARP and CCM) on the MCDA (further details given in Annex B).

6. Description of shortlisted policy options carried forward

The items on the shortlist were different categories of price-based mechanism. Specifically, these were:

- making amendments to the CCM,
- alternative amendments to the ARP, and
- the possibility of introducing an annual price-triggered SAM.

[5] These included:
Borghesi, S., Pahle, M., Perino, G., Quemin, S., & Willner, M. (2023). The market stability reserve in the EU emissions trading system: A critical review. Annual Review of Resource Economics, 15, 131–152.
Fell, H. (2016). Comparing policies to confront permit over-allocation. Journal of Environmental Economics and Management, 80, 53–68.
Willner, M., & Perino, G. (2022). Beyond control: Policy incoherence of the EU emissions trading system. Politics and Governance, 10(1), 60–70.
Gerlagh, R., Heijmans, R. J. R. K., & Rosendahl, K. E. (2021). An endogenous emissions cap produces a green paradox. *Economic Policy, 36*(107), 485–522.
Heijmans, R. J. R. K. (2023). Adjustable emissions caps and the price of pollution. Journal of Environmental Economics and Management, 118, Article 102793.

The standard practice when assessing impact with a shortlist is to use either cost-benefit or cost-effectiveness analysis. However, these work on the assumption that either the options under consideration are outcomes that can be observed and projected, or that a range of scenarios can be observed or projected. However, this future markets review was about reviewing and applying measures where shocks occurred and the market was not functioning as expected or predicted. This meant that, by definition, they would come into effect only following unpredicted and/or unlikely events.

The agreement to work towards linking the UK to the EU ETS was taken into account when considering the final price-triggered SAM options. In particular, this was considered in terms of how the choices might affect the market during these negotiations. The Authority was aware that market behaviour is reactive to potential policy changes as well as firm, finalised changes.

New mechanisms, in particular an annual price-triggered SAM mechanism that responded to annual price changes rather than auction prices or monthly average prices, were rejected. This was to avoid any new mechanisms having possible destabilising impacts on market behaviour whilst negotiations to link the UK and the EU ETS were ongoing.

Changes to the CCM were rejected as the existing CCM was considered sufficient for upper threshold stability in a standalone scheme whilst negotiations to link the UK and the EU ETS were ongoing. As noted earlier, markets policy in a linked scheme would be determined through negotiations between the UK and EU. The UK ETS and the EU ETS currently have slightly differently designed CCMs. The Authority also reflected that the UK CCM had previously triggered twice (although these triggered during the first year of the scheme, when the trigger mechanisms were more sensitive in design).

Changes to the ARP were agreed that approximated to an adjustment for inflation to the ARP introduced at launch. This was considered sufficient to operate as a lower bound in the context of a standalone UK ETS scheme whilst negotiations take place. Further information about the proposed amendment and annual uplift are in Section 10.

7. Scorecard for proposal

Part A: Overall and stakeholder impacts

(1) Overall impacts on total welfare		Directional rating
Description of overall expected impact	The overall expected impact of these changes is neutral/negligible as they will only take place during periods of market instability where the price breaches pre-designed thresholds. Also, any use of these mechanisms is expected to be short term.	**Neutral** **Based on all impacts**
Monetised impacts	The central scenario is “no effect” as the measures will only trigger during sustained market instability. Also, allowances added or removed remain inside the pre-determined cap. The total cap, which relates to total welfare, would remain unchanged.	**Neutral**

Non-monetised impacts	This reduces extreme price volatility on the lower bound (i.e. when prices are low). There are no significant non-monetised costs/benefits on total welfare.	**Neutral**
Any significant or adverse distributional impacts?	No	**Neutral**

(2) Expected impacts on businesses		
Description of overall business impact	Businesses would benefit from confirmation of the price signal continuing in the form of the ongoing price-triggered SAM upper and lower thresholds (CCM and ARP respectively). However, this is very little change from the counterfactual.	**Neutral**
Monetised impacts	The central scenario is “no effect” as the measures will only trigger during sustained market instability. Also, allowances added or removed remain inside the pre-determined cap. The total cap, which relates to total welfare, would remain unchanged.	**Neutral**
Non-monetised impacts	There are no significant non-monetised costs/benefits.	**Neutral**
Any significant or adverse distributional impacts?	There are none. No significant distributional impacts to any business sectors. No significant distributional impacts to any regions.	**Neutral**

(3) Expected impacts on households		
Description of overall household impact	Households are impacted only indirectly by the market through the impact on businesses and there are no expected impacts on businesses that would feed through to households.	**Neutral**
Monetised impacts	There are no expected monetised impacts on businesses and as the markets only affects households through businesses, there are no impacts on households.	**Neutral**
Non-monetised impacts	There are no significant non-monetised costs/benefits.	**Neutral**

Any significant or adverse distributional impacts?	No. There are no significant or adverse distributional impacts to any groups.	**Neutral**

Part B: Impacts on wider government priorities

Category	Description of impact	Directional rating
Business environment: **Does the measure impact on the ease of doing business in the UK?**	The measures are not expected to impact the ease of doing business.	**Neutral**
International Considerations: **Does the measure support international trade and investment?**	The measures are not expected to impact international trade and investment.	**Neutral**
Natural capital and Decarbonisation: **Does the measure support commitments to improve the environment and decarbonise?**	The measures do not significantly impact the environment or decarbonisation. They provide some resilience to maintaining current decarbonisation paths.	**Neutral**

8. Monitoring and evaluation of preferred option

A report was produced evaluating the UK ETS as the first part of a two-stage contract.[6] The second stage is in progress and planned to complete in 2026.

The Phase 1 report focussed on UK ETS processes and market outcomes. Phase 2 will include evaluating market activity and therefore reaction to these proposals from market

[6] Evaluation of the UK Emissions Trading Scheme: Phase 1 report, 2023. https://www.gov.uk/government/publications/evaluation-of-the-uk-emissions-trading-scheme-phase-1

participants. It will also consider the contribution of market design and decarbonisation policy.

As the scheme develops to expand to more sectors, extend the cap, adapt its approach to market stability, and/or reform its approach to free allocation, the impacts of these changes will be monitored and evaluated through the ongoing evaluation programme.

9. Minimising administrative and compliance costs for preferred option

The measures require no further information from UK ETS participants, and the amendments will be managed by the Authority with existing resources.

10. Evidence base

UK ETS market overview

The UK ETS works on the principles of cap-and-trade. A cap is set on the total quantity of UK emissions allowances (UKAs) permitted in the scheme for surrender against emissions. This cap is reduced over time.

Allowances within the cap are distributed to scheme participants primarily via market auctioning or free allocation. Each allowance under the cap is an allowance to emit one tonne of CO_2 equivalent (CO_2e). The scheme provides flexibility over how and when its operators reduce emissions through the trading of allowances on secondary markets. The allowance prices that result from auctions and trading create the incentive to reduce emissions.

- Operators whose marginal abatement costs are lower than the prevailing market carbon price can reduce their emissions and thereby reduce the number of allowances they need to purchase by investing in decarbonisation technologies and efficiency practices. Also, when applicable, operators can earn revenue by selling their free allocation allowances.
- Operators whose marginal abatement costs are higher than the market price also benefit because of this transfer by purchasing allowances at a lower cost than reducing their emissions.

In theory, trading will occur until operators' marginal cost of abatement is equal to the market price. This ability to trade means emissions are reduced where it is most cost-effective to do so. Also, the reduction in the emissions cap over time, which is set and communicated in advance, creates greater incentives to decarbonise: the expectation of fewer allowances creating the additional incentive to invest in decarbonisation technologies to avoid larger costs in the future.

Additionally, the UK ETS contains provisions to ensure market participants have sufficient flexibility over the timing of abatement, while retaining a clear and consistent incentive to decarbonise. These provisions come in two broad groups:

- Standard approaches carried out by operators and other traders: These include “hedging” or “banking” and also “borrowing” of allowances.[7] These give participants the capacity to manage the timing of abatement and emissions, and do not alter the total cap over the phase.
- UK ETS arrangements over the issuance of allowances: These include the use of unallocated allowances, the flexible share, new entrant provisions and market stability mechanisms. These allowances are within the cap.

This means that annual emissions can fluctuate around the trajectory of the cap.

UKAs are sold in fortnightly auctions each year and the revenue from those auctions goes to HM Treasury. These auctions form the primary market.[8]

- Approximately 2.2 million allowances are being offered at each 2025 fortnightly auction, totalling 56 million in the final 2025 auction calendar.
- UK ETS auctioning revenue in 2024 totalled £2.6bn from the sales of 69 million allowances.[9]

UKAs that have been released through the primary market or free allocation can subsequently be traded between participants in the secondary market. In the UK ETS secondary market, UKAs are often traded through futures contracts. A futures contract is a legal agreement to buy or sell a particular asset at a predetermined price at a specified time in the future. UKAs can also be traded directly between participants Over-the-Counter (i.e. not via an exchange), either as underlying UKAs or derivatives (i.e. futures contracts)[10]. The most traded future is the ICE end-year future.[11]

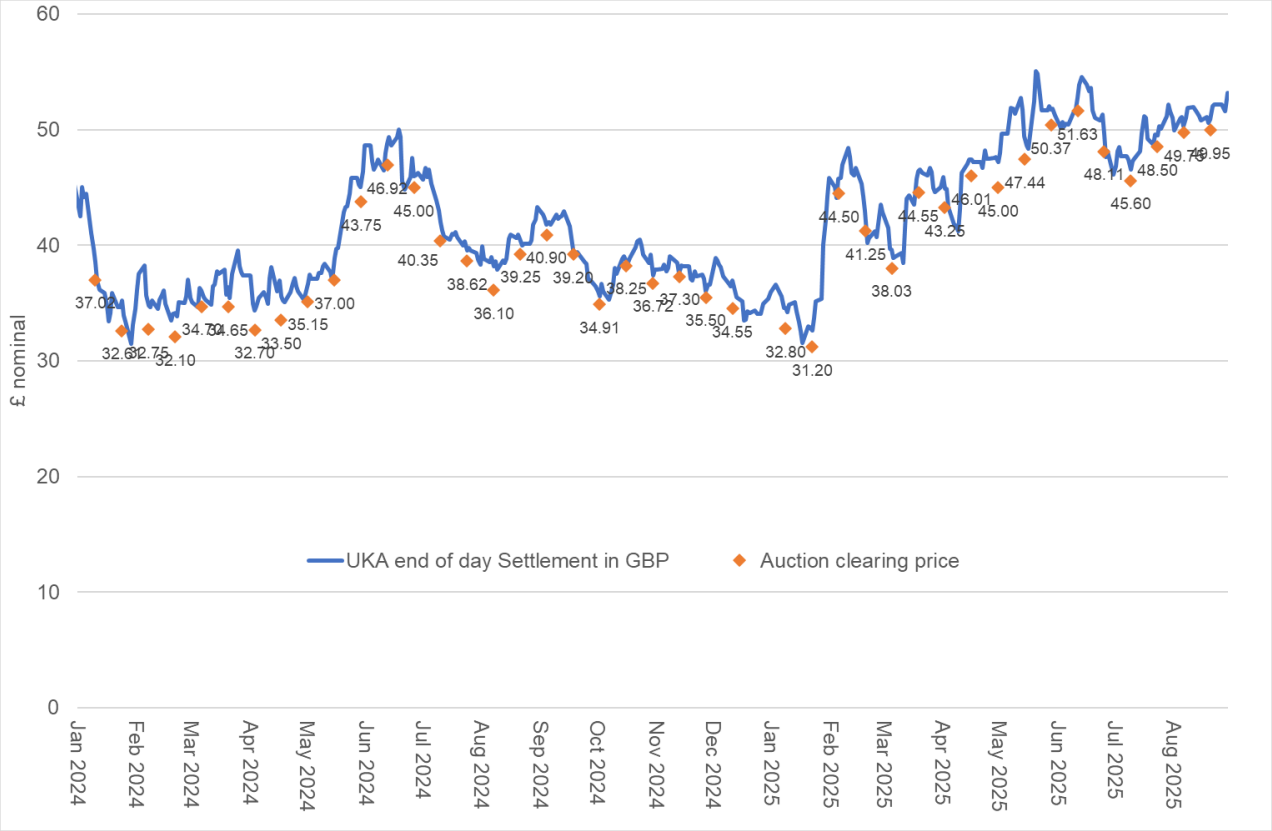
UK Carbon prices

The carbon markets generally operate on working days. The UKA price often reported for the day is the settlement price[12] of the end-year futures contract.

The price in both the primary and secondary markets since the consultation, from the start of 2024 to mid-2025, has been in the range between £30 and £60, see Figure 1.

[7] Banking takes place because allowances remain valid indefinitely, participants can “bank” allowances without limitation: in some cases for hedging. To hedge is to take an offsetting position in an asset or investment (e.g. UKAs) that reduces the price risk of an existing position (e.g. in energy). A hedge is therefore a trade that is made with the purpose of reducing the risk of adverse price movements in another asset. Borrowing means that participants entitled to free allocation can also “borrow” allowances by using in-year free allocation to comply with the previous year’s compliance obligation.
[8] For further details of how the primary market works: https://www.gov.uk/government/publications/uk-emissions-trading-scheme-markets/uk-emissions-trading-scheme-markets#uk-etsauctions
[9] This is from primary auctions.
[10] Derivatives are financial contracts that derive their value from an underlying asset, group of assets or benchmark.
[11] More information can be found: https://www.ice.com/products/80216150/UKA-Futures
[12] The price which a derivatives contract will reference at the end of each trading day and/or upon its expiration.

Figure 1: UKA settlement price vs auction clearing price, Jan 2024 – Aug 2025



Note: Nominal price is the price at the time without any adjustments for changes in the overall price level (inflation) or other factors that might affect its value over time.

Problem under consideration, with business as usual, and rationale for intervention

The Authority Response sets out amendments to the existing UK ETS, not whether to continue with the UK ETS. Consequently, this impact assessment does not re-assess the original rationale for intervention of the UK ETS, and carbon pricing more broadly. These issues were considered in the original *Future of UK Carbon Pricing* package[13] and associated impact assessment and were reiterated in the analytical annex to the Developing the UK ETS consultation and resulting impact assessment[14].

From an economic perspective, the objective of an emissions trading scheme is to enforce the polluter pays principle and internalise the cost of carbon and promote more socially optimum decision making. This is done through creating property rights for emissions, which decrease in quantity over time and this effectively drives economically efficient decarbonisation. The scheme, when functioning effectively, results in price discovery which drives decarbonisation. However, because of imperfect information the market may not operate effectively and result in prices being too low or too high.

As stated earlier, market stability mechanisms, in the form of SAMs, are a component of ETS design to address market failures and increase the economic efficiency of an ETS. They achieve this by stabilising prices in the face of economic shocks. There are two economic benefits associated with this price stability: maintaining abatement and reducing

[13] https://www.gov.uk/government/consultations/the-future-of-uk-carbon-pricing
[14] https://www.gov.uk/government/consultations/developing-the-uk-emissions-trading-scheme-uk-ets

investment costs. There is a long-standing and considerable academic evidence base supporting these two conclusions. These are set out in more detail in Annex A. The issue that the Authority Response addresses is that of whether current market policies are the most appropriate to achieve those benefits.

Changes to these mechanisms are relevant to the market participants of the UK ETS. The broad categories of participants are emitters in the power generation sector, energy-intensive industry and aviation.[15] There are separate opt-out schemes for hospitals and small emitters and for ultra-small emitters to reduce their administrative costs that mean they do not have to interact with the market.[16]

It is the responsibility of the UK Authority, through management of the UK ETS, to monitor the market, ensure it tackles market failures and ensure effective price discovery.

Policy objective

The overall intended outcome of the future markets work was to ensure that the market stability mechanisms remain fit for purpose and/or to replace them with more appropriate mechanisms if they were not fit for purpose.

The objectives which the Authority had were stated in broad terms in the consultation and are given at the front of this impact assessment. As stated earlier, these objectives were assessed primarily through selected MCDA criteria.

A successful outcome of intervention is that it ensures that the resulting market stability mechanisms minimise the impact of events that affect the effective and efficient decarbonisation path.

Description of options space

The option space was all of the market mechanisms listed and considered in the consultation – primarily all price-triggered and quantity-triggered approaches of which the team had been aware.

Counterfactual

The Counterfactual is defined as the current measures in place. This assumes that the ARP continues at £22 and the CCM continues considering six consecutive months above the trigger which is set at three times the price average of the previous two years.

Auction Reserve Price

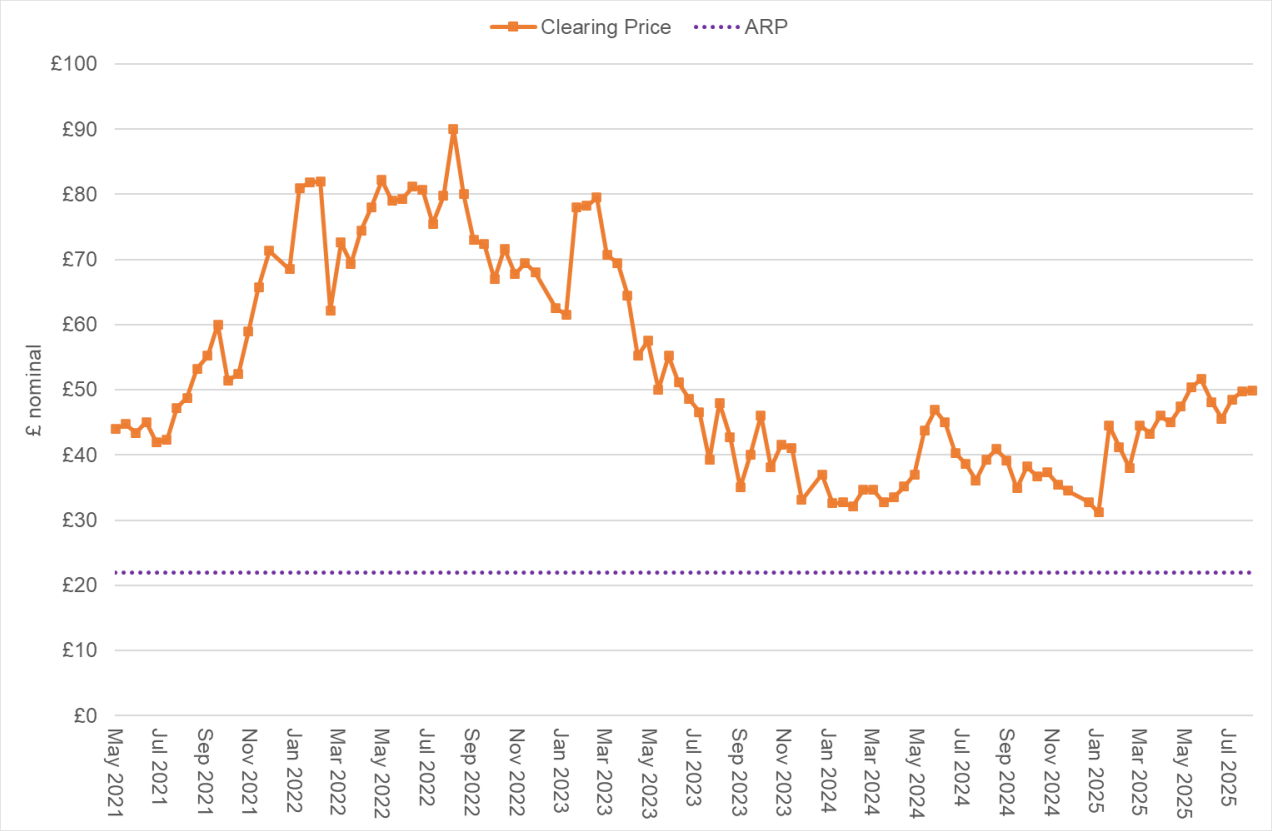
As noted earlier, any bids in primary auctions below the ARP are not accepted, providing a minimum price in auctions. The ARP was introduced on the launch of the UK ETS as a transitional mechanism to ensure a minimum level of ambition and price continuity during

[15] See the legislation for a full list of activities which define participants: https://www.gov.uk/government/publications/participating-in-the-uk-ets/participating-in-the-uk-ets#who-the-uk-ets-applies-to

[16] The former category is for both installations that primarily provides services to a hospital and those who fit the small emitter definition in terms of emissions and thermal capacity. The latter category is for installations whose reportable emissions are less than 2,500 tonnes of carbon dioxide equivalent per year.

the initial years of the UK ETS.[17] For the life span of the UK ETS, the clearing price has always been markedly above the current ARP, £22 (see figure 2).

Figure 2: Clearing Price and ARP, launch to Aug 2025



Note: Nominal price is the price at the time without any adjustments for changes in the overall price level (inflation) or other factors that might affect its value over time.

Uplift and annual increase

As the existing ARP has been decreasing in real terms since launch, the Authority concluded it wanted to increase the ARP to adjust for those years since launch and apply an annual increase to ensure it did not decrease in real terms. As allowances are not a consumer product, and other models – for projecting emissions and traded carbon values – use the GDP deflator published by the Office for National Statistics[18], this was chosen as the appropriate inflation measure for the ARP (see Table 2).

The Authority considered the increases in the years since the launch of the UK ETS and noted the events that took place that might have impacted this measure, such as covid. As a result of this work, the Authority concluded that £28 was a suitable value for the ARP to be uplifted to in order to reflect inflation since the launch of the UK ETS. Considering Figure 2 above, this would not have triggered in previous years.

[17] This was given on page 5 (point 7 of the Executive Summary) of the Government Response of the Future of Carbon Pricing.
https://www.gov.uk/government/consultations/the-future-of-uk-carbon-pricing
[18] It is a series labelled “IHYS” which is the annual change of series “YBGB” in line with that used in other models. ONS uses four-letter identifiers for its data series.
https://www.ons.gov.uk/economy/grossdomesticproductgdp/datasets/uksecondestimateofgdpdatatables

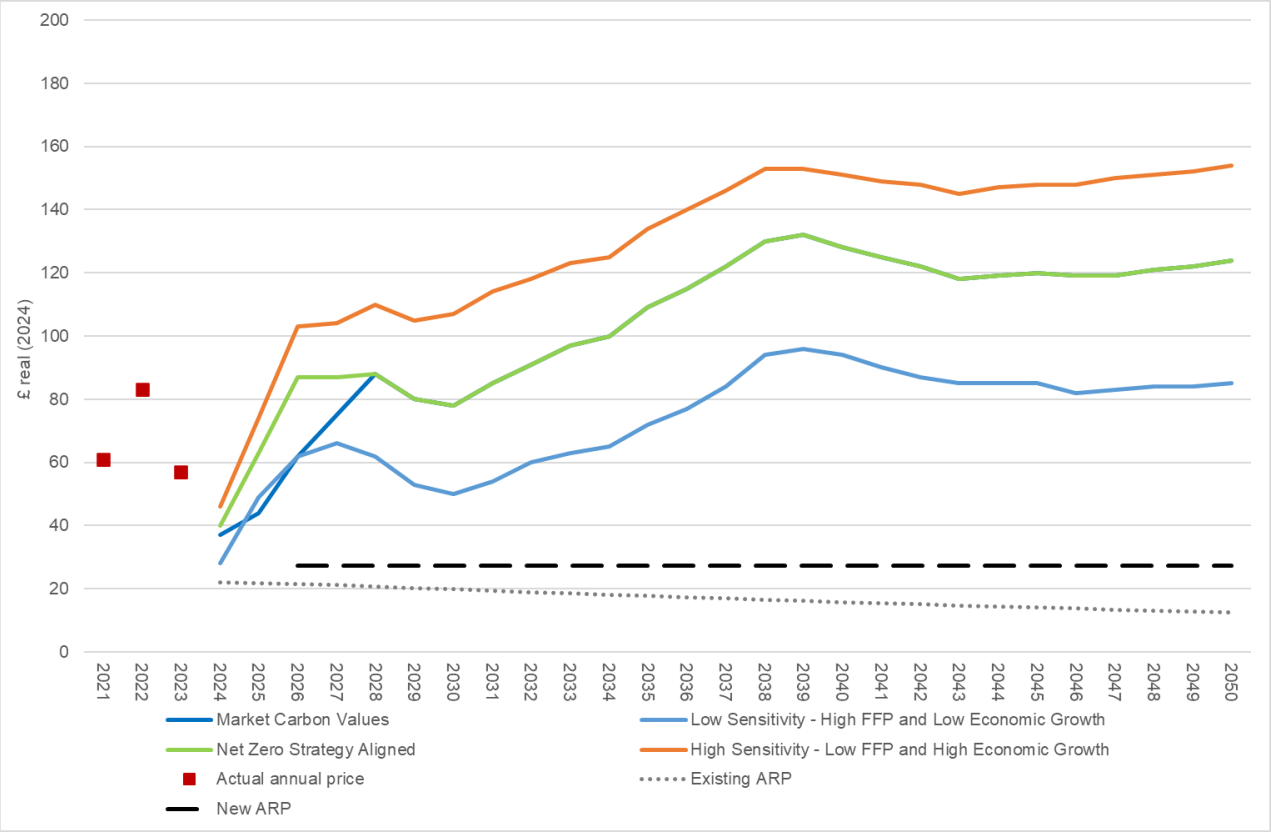
Table 2: GDP Deflator, percentage annual change (year on previous year), 2021-2024

Year	Gross domestic product at market prices: Implied deflator
2021	0.1
2022	5.4
2023	6.9
2024	4

Source: ONS, series identifier is IHYS (as at 30 July 2025)

The ARP when set to £28 and uplifted will still be below projected carbon values. See Figure 3 for the most recent Department for Energy Security and Net Zero (DESNZ) traded carbon values for modelling (2024).

Figure 3: Traded carbon values for modelling purposes compared with current and proposed ARP, annual averages £/tCO2e (real 2024)



Source: https://www.gov.uk/government/publications/traded-carbon-values-used-for-modelling-purposes-2024/traded-carbon-values-used-for-modelling-purposes-2024

Notes:

(i) The ARP is not an average value but applied to bids at primary auctions, however this demonstration gives an indication of how it compared to projected values showing both the existing ARP and the proposed in real terms (2024). The “real” price is the nominal price adjusted for inflation. It reflects the price of something relative to other goods and services at a specific point in time (in this case 2024). This is why the new ARP remains flat in real terms, but the current ARP is decreasing because no adjustment is made to it for inflation.

(ii) The assumptions (including the GDP deflator) used are the same as for the published traded carbon values.

Traded carbon values for modelling purposes are used to estimate the financial cost of purchasing allowances in the UK ETS under different scenarios and are set in real terms 2024.[19] These values are not directly comparable with the ARP; they are annual figures and the ARP applies per primary auction (which are at discrete, fortnightly intervals and the last one in the year is held in early to mid-December). However, they provide an indication that a £28 minimum bid would have no or limited impact.

MCDA

The Authority used MCDA when considering the options for market mechanisms. MCDA is a way of helping decision-makers rationally choose between multiple options where there are several conflicting objectives. It is often used when:

- there are a mix of criteria that cannot be obviously compared
- there are multiple stakeholder perspectives that affect the decision being made
- other approaches are not suitable

The aim was to assess options systematically and to surface and test assumptions. This means that the output was both a ranking and, importantly, the considerations and concerns that arose through the process. In other words, there is no single set of 'results', and the considerations of ongoing negotiations to link the UK and the EU ETS do not change the usefulness of the exercise.

The criteria that were used in the MCDA were (as given in Section 3 earlier):

- Policy intent
- Stable, long-term price and investment signal
- Price discovery
- Deliverability and feasibility
- Participant and market experience
- Market integrity

To carry out an MCDA, the Authority referred to evidence ranging from economic literature to consultation responses from stakeholders.

MCDA is further detailed in Annex B including more information about rating each criterion when comparing price-triggered SAM and quantity-triggered SAM in Table B1 and notes on weighting.

Risks and assumptions

These were the main assumptions made by the Authority when reaching its conclusions:

- The proposals would apply to a standalone UK ETS.
- Given the unpredictability of shocks and that effects of proposals would only happen in unexpected and unusual circumstances, MCDA was the most appropriate tool to determine the policy choice with careful consideration given to choosing the criteria used.

[19] For further information: https://www.gov.uk/government/publications/traded-carbon-values-used-for-modelling-purposes-2024/traded-carbon-values-used-for-modelling-purposes-2024

- Disruption to the market and its participants would be minimised through both providing long-term reassurance to participants with a rules-based approach to any Authority intervention, and by remaining as simple and straightforward as possible to provide clarity for participants. In other words, minimal changes were more appropriate whilst negotiations on linking the UK and EU ETS were ongoing.

These are the main risks:

- Market participants' reactions and choices as a result of ongoing negotiations to link the UK and EU ETS: participant behaviour will depend on how negotiations progress and may impact choices around buying and selling allowances.
- Shocks to the market having unexpected effects that are not addressed by the mechanisms considered.

Declaration

Department:

Department for Energy Security and Net Zero

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Minister responsible:

Chris McDonald

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed: 

Date: 26/11/2025

Annex A: Economic rationale

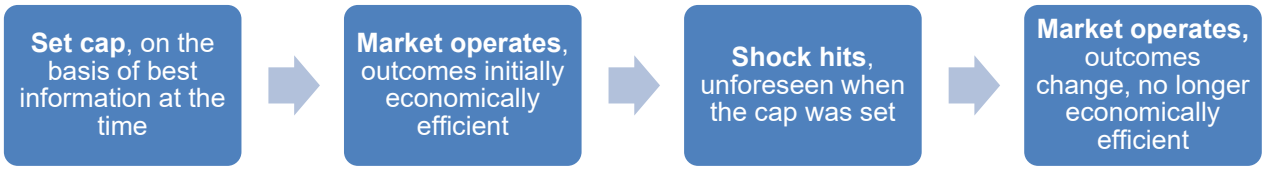
The impact of shocks on ETS efficiency

The UK ETS sets a long-term cap but allows market participants to buy and trade allowances, meaning the price is set by the market. Foresight on the cap, set in a ten year phase, allows participants to efficiently decarbonise at lowest cost over time.

However, once the cap is set, the economic fundamentals may change, due to wider economic factors. These changes are known as shocks: changes in market fundamentals that were not expected when the cap was set. For example, there could be a negative demand shock due to a recession, with reduced economic activity leading to reduced demand for allowances.

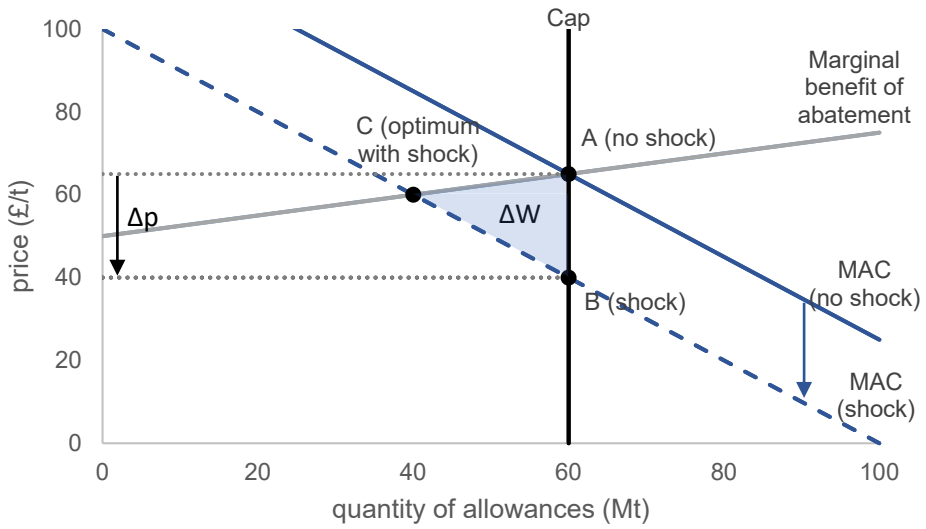
Shocks may impact the efficiency of the ETS. As outlined by Figure A1, the cap is initially set efficiency-based on current information and achieves optimal abatement.[20] A shock affects the economic fundamentals, and the market is no longer economically efficient.

Figure A1. Conceptual framework for shocks impacting ETS.



Firstly, shocks may affect price stability. A negative demand shock (like a recession) will lower demand for allowances and decrease prices, as supply is fixed. If the price reaction is immediate, the resulting price instability may have negative economic consequences.

Figure A2. Stylised economic impacts of a (reduced) demand shock.



Notes: the figure shows a standard **stylised** representation of ETS allowance supply and demand; figures are illustrative. Supply is fixed by the cap, and demand comes from a marginal abatement cost (MAC) curve (assumed here to be a linear). The cap is set at the economically efficient level given the

[20] The assumption that the cap was set at the level that was optimal at the time is maintained throughout this paper. This is consistent with the conception that SAM policy is not about retrospectively correcting failures in cap setting.

MAC at that time, so that marginal social costs and benefits of emissions are equalised.[21] The negative shock shifts the MAC downwards, lowering demand for allowances. This lowers the carbon price, reducing abatement which falls below the efficient level.

Inefficient abatement

Demand shocks impact prices and they also introduce economic inefficiencies. A negative demand shock will reduce demand for allowances and reduce prices, but abatement is fixed by the cap. As in Figure A2, the cap is fixed at the initially optimal level of 60 Mt but cannot react to negative demand shocks. Some participants who would have abated at the previous, higher price will no longer do so. The reduction in abatement is an economic loss, represented by the shaded area of Figure A2.[22]

Avoiding this market failure is the rationale for intervention of the SAM, which aims to improve price stability and therefore maintain abatement incentives, avoiding fluctuations in price and abatement.[23]

Literature review

The potential inefficiencies of a fixed-cap ETS have been well understood since Weitzman (1974).[24] The efficiency advantages of a hybrid ETS have been variously highlighted.[25] A hybrid ETS, such as one with a supply adjustment mechanism, captures elements and benefits of a fixed cap ETS and a carbon tax.

Many studies model the impact of shocks on an ETS. [26] All these studies find an ETS with a supply adjustment mechanism (i.e. a hybrid ETS) is more efficient than a fixed-cap ETS. In a meta-analysis on the topic, Fankhauser et al (2011) summarises that 'economists broadly agree' hybrid ETSs are the preferred policy tool on economic grounds. Borghesi et al

[21] The standard economic approach is to set marginal benefits equal to the Social Cost of Carbon. The UK government approach is to use target-consistent costs of carbon. The slope of the marginal benefit curve as reported in the literature is thought to be low (Pizer 2002 below – footnote 27).
[22] As discussed by Weitzman (1974) below.
[23] The efficient outcome is not necessarily complete price stability in the face of shocks, but some adjustment to supply likely improved stability. Pizer 2002 notes that an ETS with a SAM achieves greater efficiency.
[24] Weitzman, M. L. (1974). Prices vs. Quantities. The Review of Economic Studies, 41(4), 477–491.
[25] Roberts, M. J., & Spence, M. (1976). Effluent charges and licenses under uncertainty. Journal of Public Economics, 5(3–4), 193–208.
Newell, R. G., Pizer, W. A., & Zhang, J. (2005). Managing permit markets to stabilize prices. Environmental and Resource Economics, 31(2), 133–157.
Murray, B. C., Newell, R. G., & Pizer, W. A. (2009). Balancing cost and emissions certainty: An allowance reserve for cap-and-trade. *Review of Environmental Economics and Policy, 3*(1), 84–103.
[26] Pizer, W. A. (2002). Combining price and quantity controls to mitigate global climate change. *Journal of Public Economics, 85*(3), 409–434.
Fell, H. (2016). Comparing policies to confront permit over-allocation. Journal of Environmental Economics and Management, 80, 53–68.
Abrell, J., & Rausch, S. (2017). Combining price and quantity controls under uncertainty: Cost-effectiveness and market impacts. *Environmental and Resource Economics, 68*(4), 785–818.
Gerlagh, R., Heijmans, R. J. R. K., & Rosendahl, K. E. (2021). An endogenous emissions cap produces a green paradox. *Economic Policy, 36*(107), 485–522.
Aldy, J. E., & Armitage, S. (2022). The welfare implications of carbon price certainty. *Journal of the Association of Environmental and Resource Economics, 9*(5), 921–946.
Burtraw, D., Keyes, A., & Zetterberg, L. (2022). Managing interactions between carbon pricing and climate policy. *Climate Policy, 22*(6), 739–755.

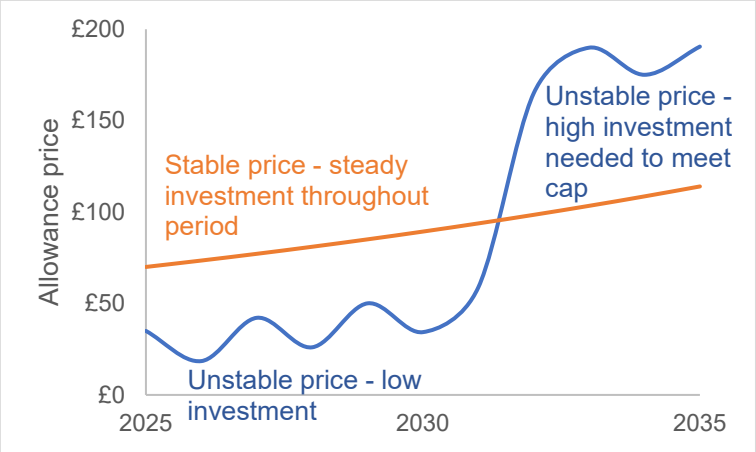
(2023)[27] review recent literature, and report very broad consensus that an ETS with a well-designed supply adjustment mechanism gives better outcomes than a fixed-cap ETS.

Inefficient investment

Price instability has a second potential economic cost. Decarbonisation requires significant investment, which requires certainty and foresight. In this case, price instability will hinder business investment. This occurs through two channels.

Firstly, an ETS can suffer from so-called dynamic inefficiency. Even if a ETS cap moves from relatively loose to tight over a phase, prices should be smoothed as businesses take long-term decisions for when to investment in decarbonisation.[28] However, if instead of a smooth price trajectory (orange line below), prices fluctuate significantly due to shocks (blue line), businesses may underinvest in abatement initially, but require high investment later in the phase, when prices are higher.[29] The blue line is more expensive (less efficient) than the orange line. In this case, price stability supports efficient, well-planned investments.

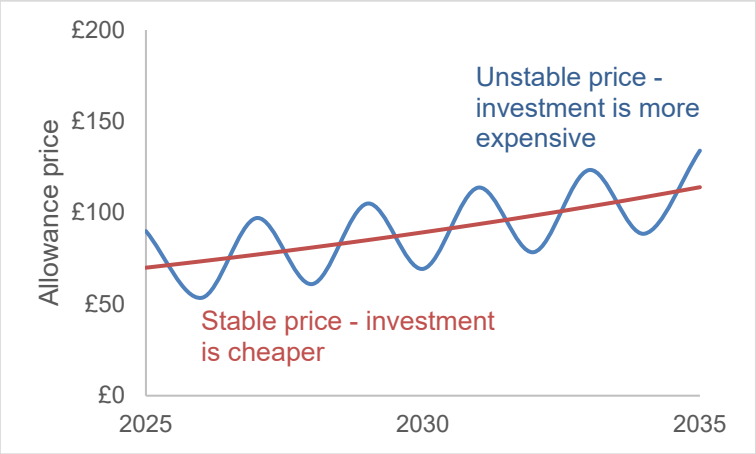
Figure A3. Illustration of dynamic inefficiency in an ETS.



Secondly, price instability can cause inefficiency through impacting on cost of capital. Even if prices follow the same broad trajectory as in the stable price scenario, instability around that trajectory (Figure A4) increases the riskiness of investments, hampering the business case for investment (or cost of capital), increasing the overall cost of decarbonisation.

[27] Borghesi, S., Pahle, M., Perino, G., Quemin, S., & Willner, M. (2023). The market stability reserve in the EU emissions trading system: A critical review. Annual Review of Resource Economics, 15, 131–152.
[28] This 'intertemporal arbitrage' is the buying and selling of allowances in different time periods with foresight.
[29] This may occur because market participants lack confidence in the longer run operation or ambition of the scheme, or because participants fail to consider long-term scheme parameters or investment.

Figure A4. Illustration of price instability raising cost of capital.



This price instability results in higher costs, both to businesses in the form of higher carbon prices required to drive investment, and to households through higher prices. Therefore, if a market instrument can improve price stability in response to shocks, this improves scheme efficiency and helps businesses plan and invest in decarbonisation at lower cost.

Literature review

It is well established within investment markets that higher risk requires higher rewards, and cost of capital is a function of risk (see for example Sullivan 1978)[30]. Applying this to carbon markets, Zhao (2000)[31] finds stable carbon prices increase decarbonisation investment. Wood and Jotzo (2011)[32] argue price stability is needed for efficient investment, and Abadie and Chamorro (2008)[33] quantify this effect. Brauneis et al (2013)[34] investigate a hybrid ETS and find it provides better investment incentives than a fixed-cap ETS. Cason et al (2023)[35] find experimentally that a hybrid ETS leads to greater investment than a fixed-cap ETS.

[30] Sullivan, T. G. (1978). The cost of capital and the market power of firms. *The Review of Economics and Statistics, 60*(2), 209–217.
[31] Zhao, J. (2000). Irreversible abatement investment under cost uncertainties: Tradable emission permits and emissions charges. Paper presented at the Agricultural and Applied Economics Association (AAEA) Annual Meeting, Tampa, FL, July 30–August 2.
[32] Wood, P. J., & Jotzo, F. (2011). Price floors for emissions trading. *Energy Policy, 39*(3), 1746–1753.
[33] Abadie, L. M., & Chamorro, J. M. (2008). European CO_2 prices and carbon capture investments. *Energy Economics, 30*(6), 2992–3015.
[34] Brauneis, A., Mestel, R., Palan, S., & Sebastian, I. (2013). The price of carbon risk: An analysis of forward pricing in the EU ETS. *Journal of Economic Behavior & Organization, 94*, 106–127.
[35] Cason, T. N., Stranlund, J. K., & de Vries, F. P. (2023). Investment incentives in tradable emissions markets with price floors. *Journal of the Association of Environmental and Resource Economists, 10*(2), 283–316.

Annex B – Multi-Criteria Decision Analysis

Use of MCDA

MCDA is a way of helping decision-makers rationally choose between multiple options where there are several conflicting objectives. It is often used when:

- there are a mix of criteria that cannot be obviously compared (e.g. Policy intent with Participant and market experience).
- there are multiple stakeholder perspectives that affect the decision being made.
- other approaches (e.g. cost-benefit or cost-effectiveness analysis) are not suitable.

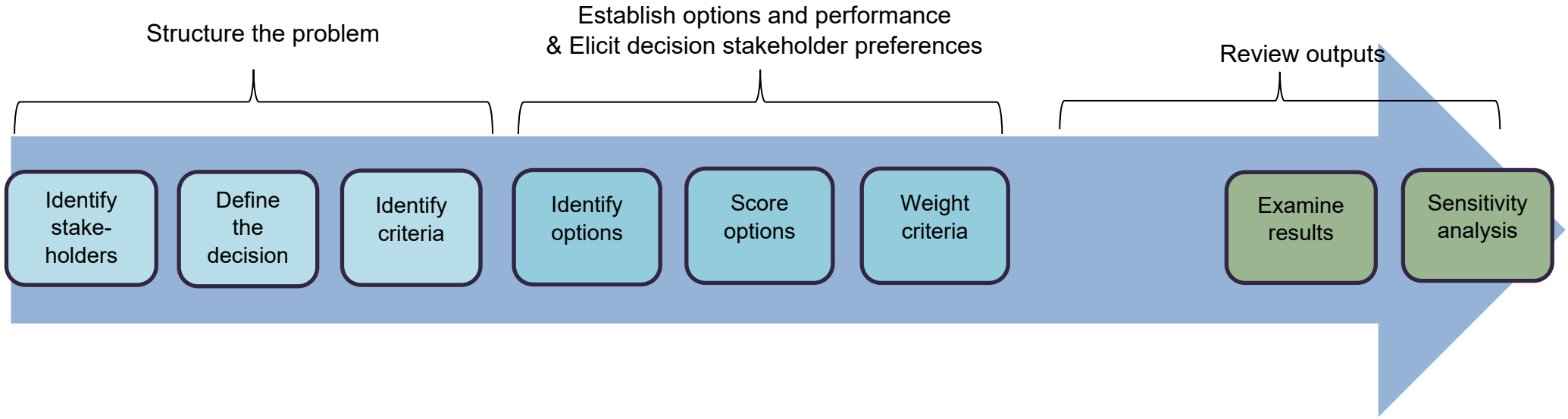
MCDA combines both qualitative and quantitative elements. The qualitative element refers to working with stakeholders/decision makers to explore their perspectives. The quantitative element refers to using models to represent stakeholder preferences and the performance of different options. These models can then be used to produce useful insights.

These methods result in an overall numerical rating for each option. This enables users to see which options are preferred and whether they are consistent with their previously stated preferences. These overall numerical ratings can mean that good performance against some criteria may compensate for poorer performance against other criteria.

MCDA is said to be a normative, or prescriptive, approach to decision analysis, rather than a descriptive approach. It indicates what decision should be made if the decision maker is consistent with previously stated preferences (i.e. if the scores and weightings fully reflect stakeholder perspectives). But MCDA rarely captures all the nuances associated with a decision. This means it should be seen as a tool to help decision makers and not as a comprehensive decision-making solution. In other words, it provides a ranked order of options that can be considered but needs to be reviewed and assessed against the robustness of assigning values to subjective valuation.

Figure B1 overleaf sets out the steps covered for MCDA and also how these were taken. The approach concludes with examining the results and sensitivity testing to ensure that options and preferences are as effectively weighted as possible within this approach.

Diagram B1: A simple representation of the MCDA approach



Description of the steps

The approach falls into categories:

- **'Structure the problem'**
- '**Establish options and performance'**
- **'Elicit decision stakeholders' preferences'**
- **'Review the output'**

The steps within the '**Structure the problem**' block are:

- *Identify stakeholders*: in this case it was members of the Authority who were considering the problem and scoring solutions.
- *Define the decision problem*: this is about getting a specific scenario/timeline/scope etc. in mind before looking at the scoring and weightings.
- *Identify criteria*: these included "Policy intent" and "Stable, long-term price and investment signal" amongst others.
- *Decide scoring technique by criterion*: in this case, direct rating was chosen as there were no suitable metrics to approximate the criteria.

The next two blocks of activity are designed to '**Establish options and performance**' and '**Elicit decision stakeholders' preferences**'. The steps are:

- *Identify options and performance*: this was used for different options, such as different forms of a price-triggered SAM or a quantity-triggered SAM. A performance matrix was created. This is a table which lists the options on one side and the criteria on the other. Then each cell is populated with a score (as there is one score per option per criterion).
- *Score options*: options, such as price-triggered SAM and quantity-triggered SAM, were scored against the criteria.
- *Weight criteria*: each criterion (e.g. 'Policy Intent') was given a relative weight. The robust process of swing weighting[36] was incorporated.

The final block of activity is designed to '**Review the outputs**'. The steps in this block are:

- *Calculating the overall value:* calculating the weighted sum to get an overall numerical rating for each option.
- *Examine results*: the Authority considered the results of the scores.
- *Conduct sensitivity analysis* – which may require iteration of steps from the 'weighting criteria' phase onwards: the Authority reviewed how much changing the scores and the weights might have changed the decision and whether they were content with those given the outcomes.

This approach can result in the stakeholders concluding that the scores needed amending and/or the criteria were not sufficient to capture the characteristics of the options. However, it is generally a helpful tool in transforming a complex problem with conflicting criteria into ranked options with reasoning.

[36] This approach involves asking stakeholders to consider the swing from 'worst' to 'best' for each criterion.

Applying the approach to the markets criteria

Table B1 overleaf shows the summary reasoning around price-triggered SAM and quantity-triggered SAM and how they related to the criteria.

Stakeholders considered appropriate weightings for the criteria. These varied but, broadly overall, *Policy intent* was given the greatest weight followed by *Stable, long-term price and investment signal* and also *Participant and market experience*.

MCDA reasoning by criteria

Criteria	Quantity-triggered SAM	Price-triggered SAM	No SAM
Policy intent	Amber: As the quantity-triggered SAM adjusts the supply of allowances it supports cost effective decarbonisation. Economic rationale sets out that it addresses unexpected shocks but can magnify expected shocks.	Green: As the price-triggered SAM adjusts the supply of allowances it supports cost effective decarbonisation. Economic rationale sets out that it addresses both expected and unexpected shocks.	Red: No SAM means no mitigation against expected/unexpected shocks. No SAM leads to economic inefficiency.
Price discovery	Amber Green: A quantity-triggered SAM will not directly restrict price discovery. However, any intervention will adjust supply and is likely to indirectly impact the price.	Amber Green: A price-triggered SAM mechanism allows for price discovery within a range of prices (the thresholds). However, a narrow price corridor could prevent price discovery.	Green: No SAM would enable efficient price discovery in the market as there would be no intervention to inject or withdraw allowances.
Stable, long-term price and investment signal	Amber Green: Can support investment signal by providing support to the market and more resilience to shocks. Unclear on future carbon price trajectory.	Green: Can support investment signal by providing support to the market and more resilience to shocks. By setting price triggers, it may be more transparent and predictable to incentivise investment and abatement.	Amber Red: No SAM is less likely to result in a stable, long-term price.
Deliverability and feasibility	Amber: Assessment indicated deliverable through legislation and low to moderate impact.	Amber: Assessment indicated deliverable through legislation and low to moderate impact.	Green: Not applicable.
Participant and market experience	Green: Majority of participants agreed with the Authority's minded-to position of implementing a quantity-triggered SAM. There were nuances including the existence of current price-based mechanisms (ARP and CCM) as well as the familiarity with the quantity-triggered SAM in the EU (Market Stability Reserve).	Amber Green: A minority of respondents disagreed with the Authority's minded-to position and advocated for the implementation of a price-triggered SAM. However, many assumed ARP and CCM would remain and be strengthened. Price for participants is easy to monitor, therefore more transparent and predictable for planning. Limited stakeholder views on price-based given minded-to position of consultation.	Amber Red: Most participants believe that the UK ETS would benefit from a SAM to address the risk of a demand shift with long-term impacts. However, it is easy for participants to understand not having a SAM. No SAM means a lack of confidence from participants as the ETS is not resilience to shocks.

Criteria	Quantity-triggered SAM	Price-triggered SAM	No SAM
Market integrity	Amber Green: There is limited evidence but that obtained indicated there was unlikely to be a high risk of market manipulation.	Amber Green: There is limited evidence but that obtained indicated there was unlikely to be a high risk of market manipulation.	Green: Without a SAM, there is no market manipulation of a SAM.

Colour Key:
Red: Low score: High risk
Amber Red: Low/Medium score: High/Medium risk
Amber: Medium score: Medium risk
Amber Green: Medium/High score: Medium/Low risk
Green: High score: Low risk