



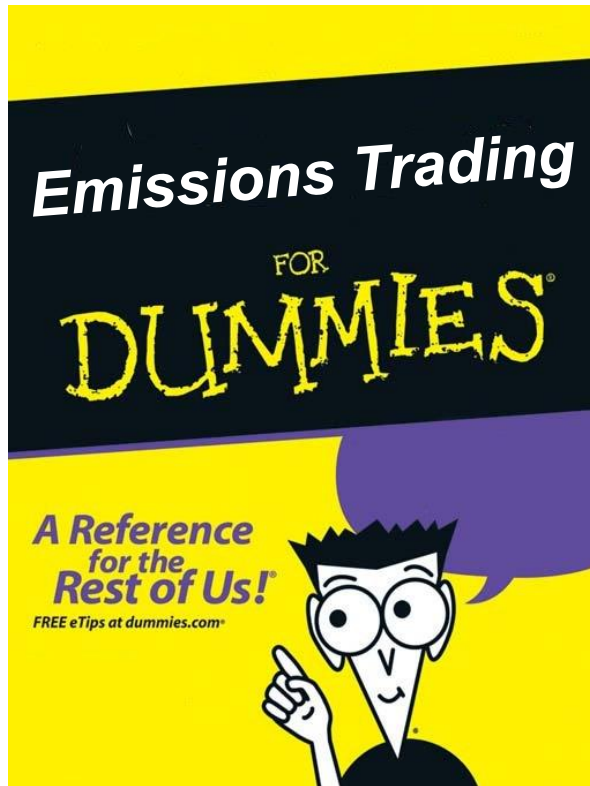
The UK Emissions Trading Scheme (UK ETS)

What emissions trading and carbon pricing does

Key design features of the UK ETS

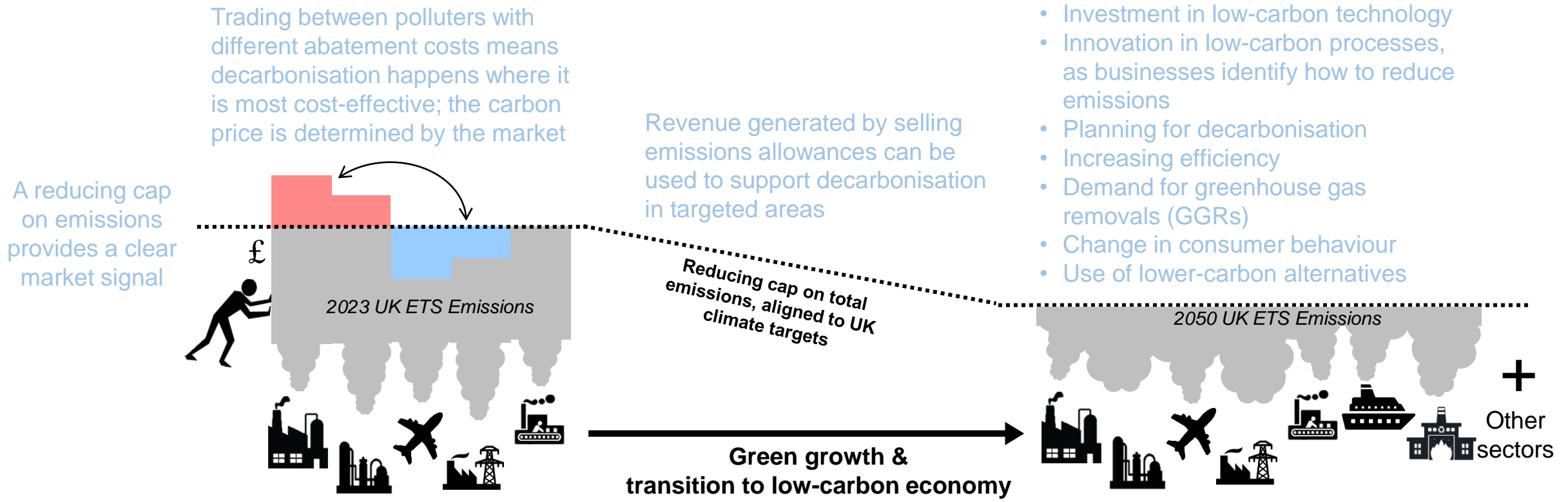
Future of UK ETS

Oct 2023



- Emissions Trading (aka 'cap and trade') is a policy which delivers emissions reductions
- A limit (the cap) is set on emissions, which reduces over time
- The cap is divided into allowances (aka permits)
- Allowances are sold
- Polluters monitor and report their emissions
- Polluters must buy and surrender enough allowances to cover their emissions
- Reducing supply of allowances over time = reducing emissions

How does ETS deliver emissions reductions?

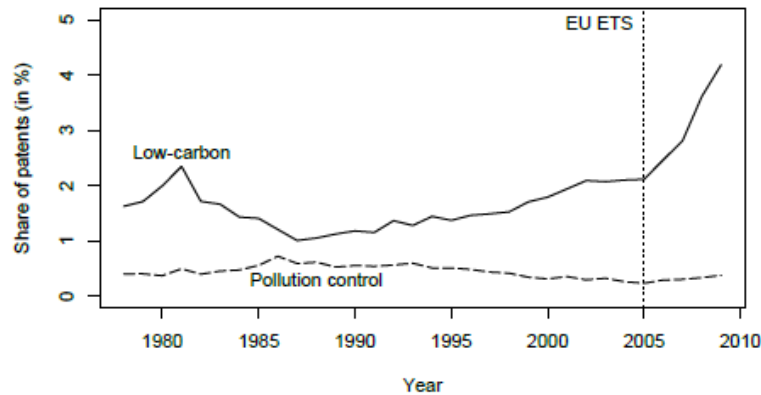


Carbon pricing helps 'push' innovation effort in low-carbon sectors

Abstract

This paper investigates the impact of the EU Emissions Trading Scheme (EU ETS) on technological change. We exploit installations-level inclusion criteria to estimate the impact of the EU ETS on firms patenting. We find that the EU ETS has increased low-carbon innovation among regulated firms by as much as 10%, while not crowding out patenting for other technologies. We also find evidence that the EU ETS has not impacted patenting beyond the set of regulated companies. These results imply that the EU ETS accounts for nearly a 1% increase in European lowcarbon patenting compared to a counterfactual scenario.

Figure 1: Share of low-carbon patents (1978–2009)



Raphael Calel, Antoine Dechezleprêtre; *Environmental Policy and Directed Technological Change: Evidence from the European Carbon Market. The Review of Economics and Statistics* 2016; 98 (1): 173–191.

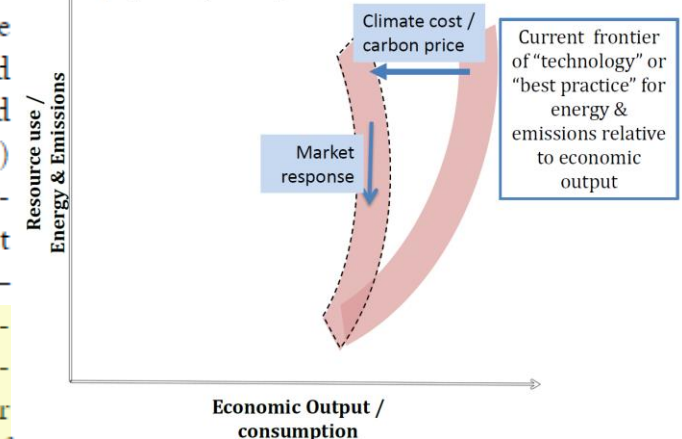
main conclusions. (a) Demand-pull forces enhance patenting; econometric studies find positive impacts in industry, electricity and transport sectors in all but a few specific cases. This applies to all drivers—general energy prices, carbon prices, and targeted interventions that build markets. (b) Technology costs decline with cumulative investment for almost every technology studied across all time periods, when controlled for other factors. Numerous lines of evidence point to dominant causality from at-scale deployment (prior to self-sustaining diffusion) to cost reduction

Given the unambiguous finding that market-wide prices do generally influence patents, the case for carbon pricing is enhanced further, in light of the push it may give to low carbon innovation, amplified with path dependency (as found in the modelling review cited above). However, carbon pricing alone may be a very blunt way of stimulating innovation, particularly for sectors like energy which have very low natural levels of innovation as measured by private R&D (and potentially, innovation biased towards incumbent interests). As Grubb *et al* (2014) later observed, 'if the innovation chain is broken, carbon pricing alone will not fix it.' The clear impact of targeted demand-pull policies on innovation—outcomes as well as patents—underlines that successful innovation needs pull as well as push and that well-designed, targeted policies may provide a far stronger and more focused pull than any plausible level of general carbon or other externality pricing. Such tar-

Resources → welfare via technology

climate change imposes a cost

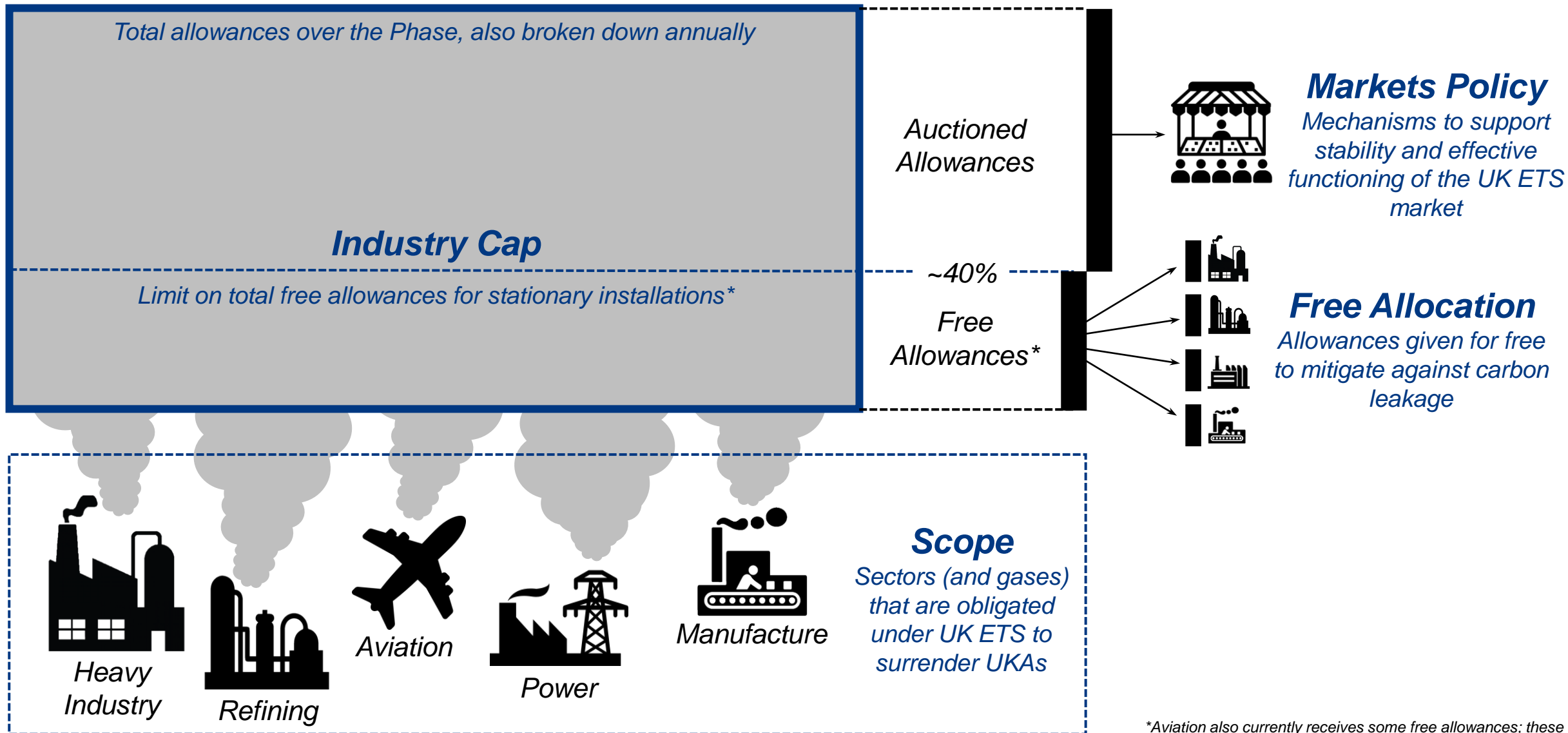
/ carbon price reflects this, requiring emitters to pay more, driving markets to choose cleaner techs



Michael Grubb *et al* 2021 *Environ. Res. Lett.* 16 043007

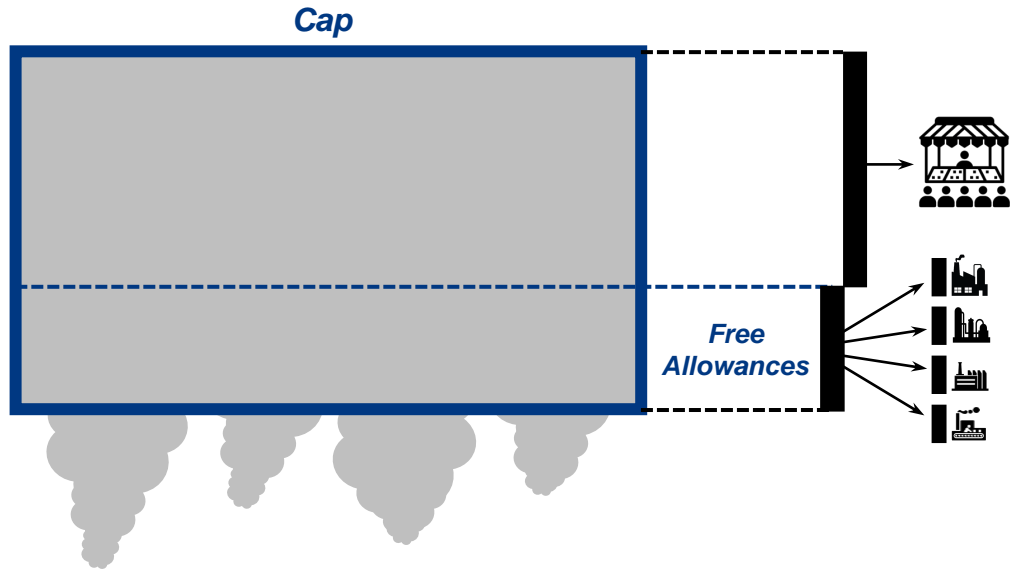
What are the key design features of the UK ETS?

Cap



*Aviation also currently receives some free allowances; these still fall under the total cap but do not count towards the industry cap

Cap and free allocation



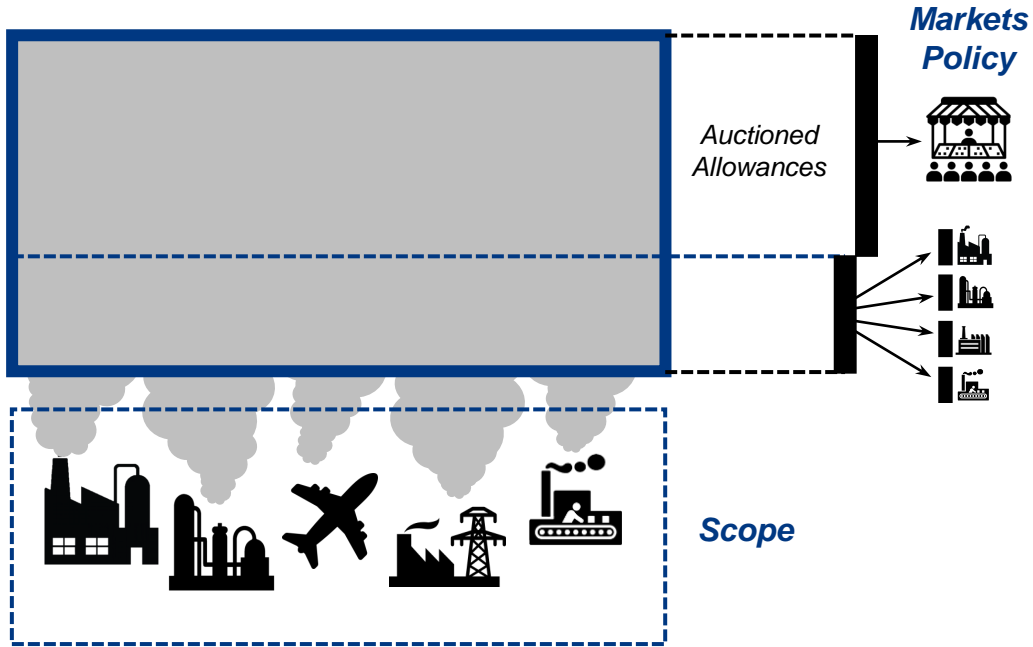
The cap sets the limit on emissions, in line with delivering climate targets

- Sets limit over a phase; also broken down annually
- 1 allowance = 1 tonne CO₂equivalent
- Emitters need to surrender allowances annually.
- Can choose to either buy allowances (i.e. pay the carbon price), or invest in technology to reduce emissions.
- Decarbonisation happens where it is cheapest to do so.

Free allowances mitigate risk of carbon leakage by reducing exposure to the carbon price

- Carbon leakage is when:
 - Climate mitigation policies differ across jurisdictions, and
 - Emissions shift to a region with lower climate mitigation obligations, and
 - Shifts in production lead to a sustained increase in emissions, higher than it would have been had production not moved.
- UK ETS participants may receive a proportion of their allowances for free, dependent on their historic emissions, carbon leakage risk, and carbon efficiency compared to the benchmark – therefore rewarding the most carbon efficient companies.
- The total free allocation given each year is limited by the industry cap

Auctions, markets and scope



Allowances are sold through auctions and trading is enabled to establish a market: there are mechanisms to support effective functioning of this market

- The Auction Reserve Price (ARP) sets a minimum bid price at auctions of £22.
- The Cost Containment Mechanism (CCM) provides option to intervene if prices are elevated for a sustained period of time.
- The volume of allowances to be sold at each auction is set out in the auction calendar at the start of each year.

Around a quarter of UK Greenhouse Gas (GHG) emissions are currently within scope of the UK ETS

- Any business involved in a regulated activity must monitor and report emissions of certain GHG emissions, and surrender enough UK ETS allowances to cover their emissions each year. There are 678 installations and 369 aircraft operators in the UK ETS main scheme (as of 2023).
- Carbon Dioxide (CO₂) is the main GHG covered.
- Activities within scope include fossil fuel-fired electricity generation, oil and gas refining, and production of cement, iron, steel, aluminium, glass, ceramics, paper and pulp, and chemicals including ammonia and hydrogen.

What have we announced recently?

July 2023 Govt Response to consultation on Developing the UK ETS

Main government response

We have made the following decisions:

- setting the UK ETS cap to be consistent with net zero and doing this at the top of the net zero consistent range
- smoothing the transition to the net zero cap through releasing 53.5 million additional allowances from the reserve pots to the market between 2024 and 2027
- setting the industry cap at 40% of the overall cap
- providing long term market resilience, putting aside 29.5 million allowances for future market management
- reviewing technical changes to free allocation
- phasing out free allocation for the aviation sector for the 2026-2030 allocation period
- expanding the scope of the scheme to include additional sectors in the UK ETS and capping a greater proportion of UK emissions
- incorporating Greenhouse Gas Removal (GGR) technologies in the UK ETS, subject to further consultation

Developing the UK Emissions Trading Scheme: main response (3 July 2023)

<https://www.gov.uk/government/consultations/developing-the-uk-emissions-trading-scheme-uk-ets#:~:text=Main%20government%20response&text=setting%20the%20UK%20ETS%20cap,market%20between%202024%20and%202027>

Cap: is now net zero consistent!

- Auction calendar updated in October to put plans announced earlier this year into action - to reduce the cap on carbon emissions in line with the UK's net zero strategy.

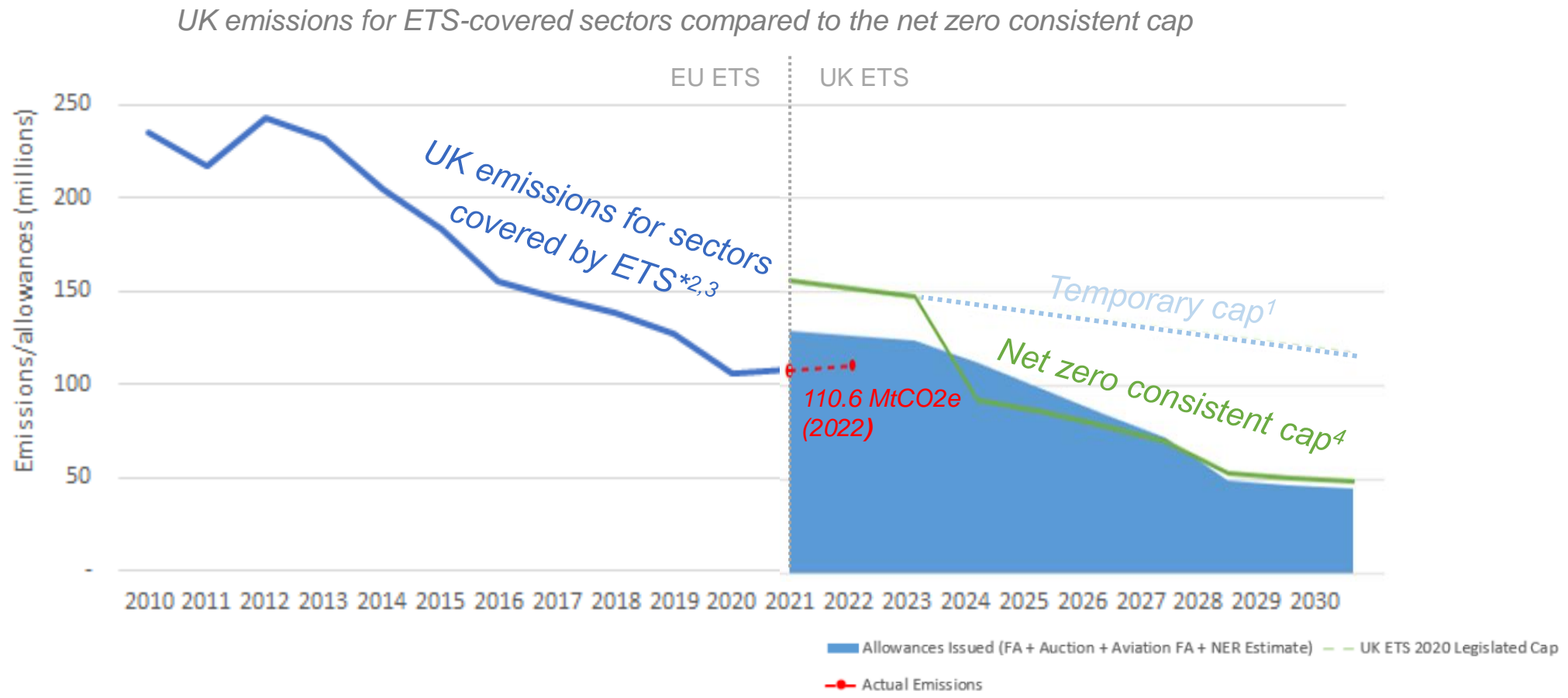
The 2024 calendar for the UK's Emissions Trading Scheme will limit the number of carbon allowances for companies to buy in 2024 to 69 million – 12.4% fewer than in 2023, and their lowest-ever level. By 2027, this will fall to around 44 million – a 45% reduction on 2023 - before reaching around 24 million by 2030.

<https://www.gov.uk/government/news/emissions-scheme-to-reduce-sale-of-carbon-allowances-on-path-to-net-zero> (Oct 2023)

Upcoming consultations

- Markets: key areas of market management, including future of market stability mechanisms, auction reserve price, the cost containment mechanism and examining the potential merits of a supply adjustment mechanism.
- Free allocation: determine how free allowances are distributed to participants post 2026. The priority will be to ensure sectors most at risk of carbon leakage continue to receive sufficient protection.
- Scope Expansion: details of how maritime and energy from waste will be brought into the scheme from 2026.

What is the 'net zero consistent cap' exactly?



Sources:

1. The temporary UK ETS cap, which was legislated for the start of the scheme, which has been replaced by the net zero consistent cap <https://www.legislation.gov.uk/uksi/2020/1265/article/22/made>
2. UK emissions for sectors covered by EU ETS for 2010-2020 <https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1>
3. UK ETS emissions for 2021 https://reports.view-emissions-trading-registry.service.gov.uk/ets-reports/section4/uk_ets_Standard_Report_Compliance_Emissions_20220422080431740.xlsx
4. Developing the UK ETS: Main Response, July 2023 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1166812/uk-emissions-trading-scheme-consultation-government-response.pdf

And what does this mean for free allocation?



Pre-2026 (first allocation period for free allowances)

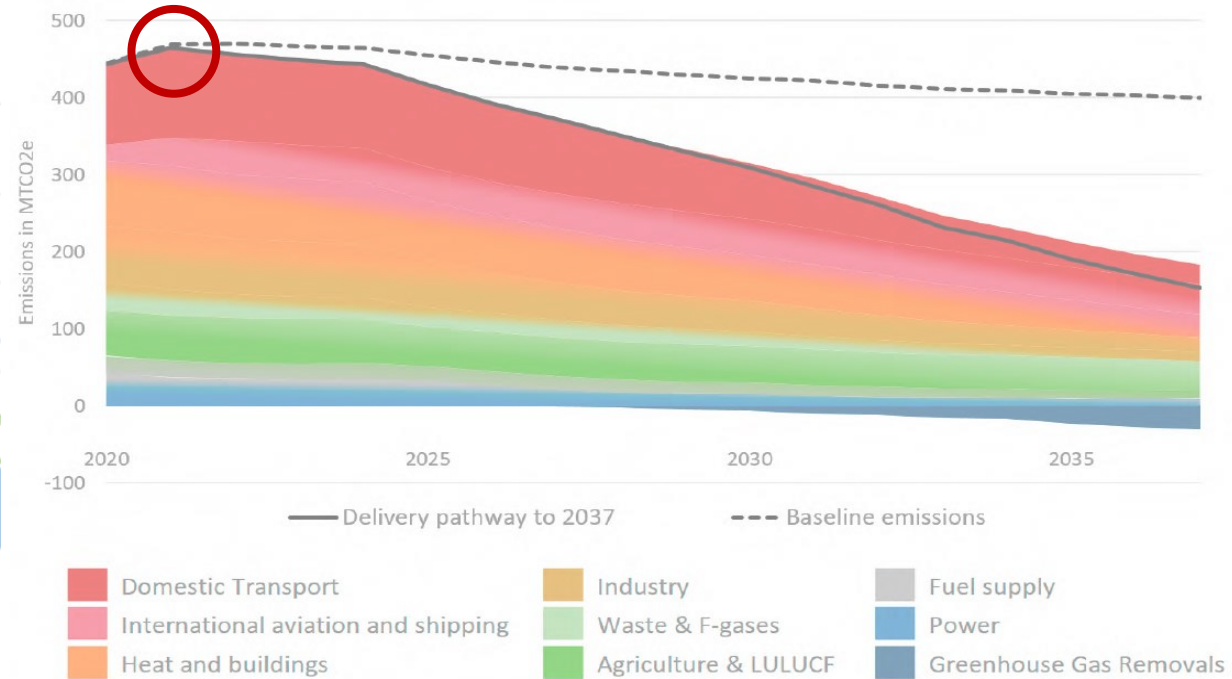
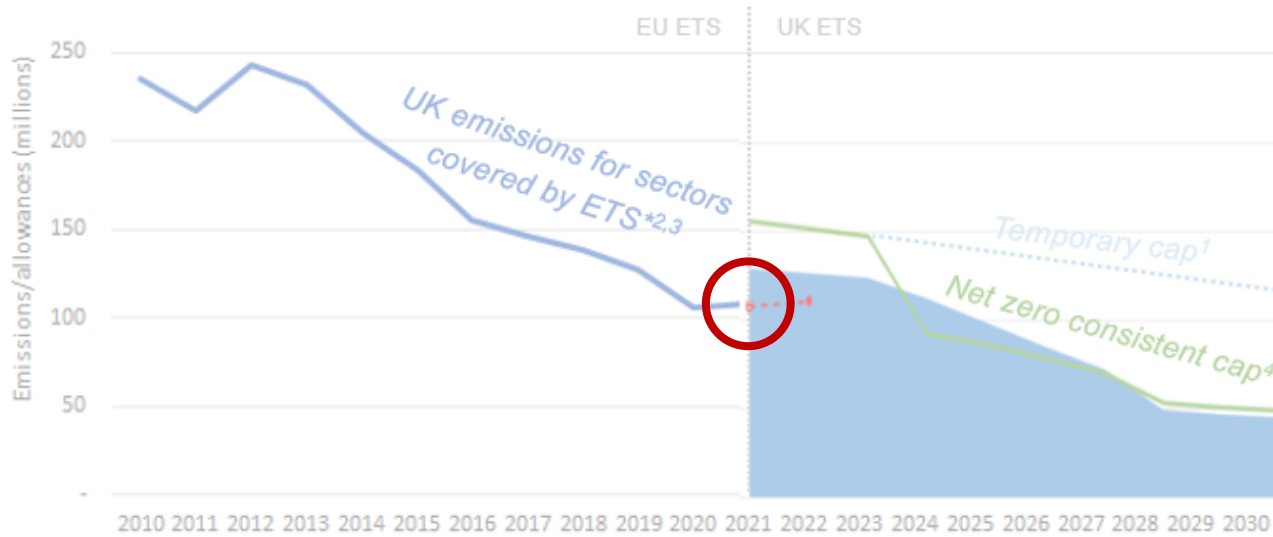
- Reset industry cap in 2024 to align with introduction of net zero cap.
- Set industry cap at higher level of 40%
- Maintaining free allocations for industry to provide certainty for businesses. We will use our reserve allowances to maintain free allocations at their current levels until 2026, subject to Activity Level Changes.

Post-2026 (second allocation period for free allowances)

- Continue our review of free allocation before the end of the year.
- This next phase of the free allocation review will determine how free allowances are distributed to participants post 2026. The priority will be to ensure sectors most at risk of carbon leakage continue to receive sufficient protection. We will be looking at ways to make free allocation better targeted.
- Setting industry cap at 40% provides more flexibility in the decisions made in this review.

But UK ETS doesn't apply carbon price to all emissions...

...so we're also including more sectors, starting with waste incineration and maritime



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New sectors

- Expand the scope of the UK ETS to include **domestic maritime by 2026**, and energy from **waste and waste incineration in 2028** (preceded by a two-year phasing period from 2026-2028).
- This will mean that we put a **cap on a greater proportion of UK emissions** and help these sectors decarbonise in the most efficient way.
- **Consult on full details** of how this will work, aiming for **end 2023/very early 2024**.
- This consultation will cover full technical detail of the expansion, including monitoring, reporting, and verification of these emissions, thresholds, how the cap may be adjusted to account for the additional sectors, and interactions with other relevant policies such as extended producer responsibilities.

Existing sectors

- Align rules for subtractions to create a more level playing field between operators who use **pipeline and non-pipeline modes of transportation for storing CO₂** (aka CCS).
- Bring **CO₂ venting** from upstream oil and gas into the scope of the UK ETS.
- Consult further on introducing **UK ETS biomass sustainability criteria** for ensure only sustainable biomass has emissions zero rated under UK ETS.

Greenhouse gas removals

- The Authority believes that the **UK ETS is an appropriate long-term market for GGRs**.
- This will help to **drive investment in innovative GGR technologies**. These changes will be subject to further consultation.
- We believe the UK ETS may offer an appropriate long-term market for high quality nature-based GGRs, **subject to further work to consider the range of potential issues** brought forward through the Call for Evidence and by the CCC regarding permanence, costs and wider land management impacts.

And we're setting out a pathway for UK ETS beyond 2030

The Skidmore review recommended that:

- Provide businesses with certainty and increase the incentives to invest in new, green technologies
- By 2024, develop a pathway for the UK ETS until 2040.
- This pathway should:
 - i. Set out a vision on the future design and operation of the ETS
 - ii. Set out a timeline for expanding the coverage to the rest of the UK economy, as well as sectors consulted on including maritime and waste.
 - iii. Address inclusion of GGRs to incentivise early investment in new technologies and potentially nature-based solutions.
 - iv. Provide reassurance to businesses around how the Government will mitigate the risk of carbon leakage as a result of expanding the ETS.

MISSION ZERO

Independent Review of Net Zero

Rt Hon Chris Skidmore MP



What are some wider developments in global carbon pricing?

EU ETS 2

In July 2021, the European Commission proposed the “Fit for 55%” package of reforms to align EU policy with the European Green Deal objectives, most importantly the more ambitious 2030 climate target of at least a 55% net emissions reduction compared to 1990. Among other things, the package included a proposal to extend emissions trading to new sectors.

In December 2022, the European Parliament and the Council of the EU agreed to establish a new ETS for emissions from fuels used in buildings, road transport and certain industrial sectors not already covered by the existing EU ETS. The agreement is now pending formal approval by the respective institutions.

This new ETS (“ETS 2”) will complement Member States’ efforts to reduce emissions in line with national targets under the “Effort Sharing Regulation” (Regulation (EU) 2018/842). It will be separate from the existing EU ETS for emissions from electricity and heat generation, industrial production, maritime transport and commercial aviation in the bloc.

The agreement provides that the ETS 2 will launch in 2027 or 2028. The start may be postponed by one year in the event of exceptionally high energy prices. The system will cover emissions upstream, thus regulating fuel suppliers rather than end-consumers. It will put an absolute cap on emissions, which will decrease in line with a linear reduction factor. Allowances will be distributed exclusively via auctioning. Auction volumes will be frontloaded in the first year to ensure a smooth start of the system. In addition, a market stability reserve will adjust the supply of allowances in support of market balance.

The ETS 2 will be introduced alongside a new Social Climate Fund. Part of the revenues raised will be directed to the Fund to support vulnerable households and micro-enterprises, with 25% co-financing from Member States.

<https://icapcarbonaction.com/en/ets/eu-emissions-trading-system-buildings-and-road-transport-eu-ets-2>

EU CBAM

From 1 October 2023, the EU’s Carbon Border Adjustment Mechanism (CBAM) has entered into effect, starting with a transitional phase that runs until the end of 2025. During this period, EU-based importers of goods covered by CBAM from non-EU countries will be obligated to report the embedded emissions of their imports, without incurring any financial liabilities. The obligation to purchase and surrender CBAM certificates will then apply from 2026, effectively imposing a carbon price that should reflect the allowance price level in the EU ETS.

The first policy of its kind in the world, CBAM will initially apply to imports of electricity, aluminium, iron and steel, cement, fertilizers, and hydrogen. From 2026, imports of these goods into the EU will be charged a carbon levy based on the embedded emissions generated during the production process. The mechanism’s key objective is to level the playing field for European producers who face a carbon price for their emissions under the EU ETS while encouraging industrial decarbonization globally.

<https://icapcarbonaction.com/en/news/eu-carbon-border-adjustment-mechanism-cbam-takes-effect-transitional-phase>

Consultation description

On 30 March, the government published an exploratory consultation considering a range of potential policy measures to mitigate carbon leakage risk in the future and ensure UK industry has the optimal policy environment to decarbonise. Potential policies include a carbon border adjustment mechanism (CBAM), mandatory product standards (MPS), and other policy measures to help grow the market for low carbon products, as well as emissions reporting which could support the implementation of potential mitigation policies.

<https://www.gov.uk/government/consultations/addressing-carbon-leakage-risk-to-support-decarbonisation#full-publication-update-history>