

Replacement for the EU Emissions Trading Scheme (EU ETS) Research Briefing

October 2020



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Research Briefing

October 2020

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Paper Overview:

This paper has been produced under the Research Service Brexit Academic Framework Agreement. Under the Framework, experts provide research and advice services to the Senedd Commission in relation to Brexit, to supplement the work of the Research Service.

Joshua Buke has provided the following analysis, which considers the proposals set out in the UK Government and devolved administrations' response to the 'Future of UK Carbon Pricing' consultation. A second paper will address the detail of the proposed Common Framework on the future Emissions Trading System (ETS).

All views are those of Joshua Burke and not those of the Research Service.



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1. Wales's greenhouse gas emissions and climate change targets

If there is no action on climate change we face dangerous consequences; the case for accelerated action is clear. This applies as much to Wales as anywhere, even though Wales' greenhouse gas emissions have fallen substantially over the last 20 years, while Gross Value Added (GVA) has risen.

Although the UK Government has committed to reducing greenhouse gas emissions to net-zero by 2050, the devolved administrations have country-specific legal and governance arrangements. In Wales, these are underpinned by the **Environment (Wales) Act 2016** (the Environment Act) which placed new obligations on the Welsh Government to reduce emissions. These included ensuring that net emissions are at least 80% lower by 2050 from a 1990 or 1995 baseline, decadal emissions targets (e.g. in 2020, 2030 and 2040) and five-year carbon budgets. However, the target of 80% emissions reductions will soon be superseded by forthcoming legislation in 2021 to increase ambition by targeting emissions reductions of 95% on 1990 levels by 2050, with an ambition to achieve net-zero.

Wales also has a unique greenhouse gas emissions profile. This is driven by a high share of UK industry and manufacturing and a disproportionately high proportion of the UK's gas power generation capacity. Consequently, a large proportion of Wales's emissions are from few but large emitters across Wales.

2. Why carbon pricing?

Strong policy that reflects these country-specific circumstances is essential to deliver on this ambitious new climate target and realise the boost to clean growth it could bring. Such policy design includes – but it is not limited to – the use of carbon pricing, which is an indispensable part of any strategy to reduce emissions in an efficient way.

The case for carbon pricing has been made compellingly by [Bowen \(2011\)](#), who shows that it is an ideal tool with which to reduce greenhouse gases in a cost-effective manner. A strong carbon price is arguably even more important for meeting a net-zero ambition than it is for reducing emissions by 80%. Net-zero will be very hard to achieve without a higher price on carbon. Carbon pricing must be part of a broader set of policy interventions, dealing with a variety of barriers and externalities that hold back decarbonisation. However, a policy strategy with a carbon price at its core is more likely to be efficient and fair than one without. The Welsh Government's [Low Carbon Delivery Plan](#) acknowledges that carbon pricing is an important and cost-effective economic policy lever, channelling investment in and substitution to cleaner technologies.

2.1. Carbon pricing is both fair and efficient

The *fairness argument* in favour of pricing carbon rests on a key principle of environmental law, which states that polluters must pay for the damage they cause or for its abatement. A carbon price is the most explicit way to ensure this. Low-income households and communities are the ones who are most vulnerable to the societal and economic impacts of climate change and pricing carbon is a way of ensuring that the costs are borne by those who are causing the impacts through greenhouse gas emissions rather than those who are affected.

The *efficiency argument* for putting a price on carbon follows directly from basic welfare economics. Policy intervention is needed when markets do not work perfectly, and a price on carbon would correct the fundamental market failure that is at the core of the climate problem. The emitters of greenhouse gases are not confronted with the economic, social or environmental risks associated with greenhouse gas emissions. Climate change impacts are an 'externality' that is not factored into decision-making.

The expectation is that once emitters are confronted with the full cost of their actions through a carbon price, they will find ways to reduce their carbon output.

How exactly they do this is left to them, rather than prescribed by a regulator. This flexibility is associated with economic efficiencies in the form of lower overall abatement costs. Emissions are reduced wherever and however it is cheapest to do so. There are also regulatory efficiencies: regulators require much less information about the abatement potential in regulated firms. Faced with massive technological uncertainties, they are less likely to get it wrong. Pricing carbon is therefore a cost-effective way of addressing climate change.

Yet carbon pricing is often hard to implement as it is more transparent than other policies about its economic winners and losers. Consumers are extremely sensitive to changes in the prices of vital provisions such as energy, transport and food. Thus, in practice carbon prices are often too low to be truly effective, many sectors are not covered, and in those that are, significant exemptions dilute policy efficacy. Careful consideration of how costs are distributed across society is a prerequisite to achieve both immediate **political feasibility** and the durability of carbon pricing policy over time. The failure to do this is one of the reasons why governments around the world frequently fall short in their efforts to put an adequate price on carbon.

3. Carbon pricing instruments in the UK

The UK currently operates a hybrid carbon pricing system in which it participates in the European Union Emissions Trading System (EU ETS) as well as applying domestic carbon taxes. The two main carbon taxes are the Carbon Price Support and the Climate Change Levy.

3.1. Membership of the EU ETS

Emissions trading, also known as ‘cap and trade’, is a cost-effective way of reducing greenhouse gas emissions. To incentivise firms to reduce their emissions, a government sets a cap on the maximum level of emissions and creates permits, or allowances, for each unit of emissions allowed under the cap. Emitting firms must obtain and surrender a permit for each unit of their emissions. They can obtain permits from the government or through trading with other firms. The government may choose to give the permits away for free or to auction them.

The EU ETS, in which the UK will continue to participate until the end of the Brexit transition period, is currently the world’s largest system. It operates in all 27 EU countries plus Iceland, Liechtenstein, Norway and the UK, limiting emissions from more than 11,000 heavy users of energy including power stations and industrial plants, and airlines operating between the ETS member countries. In total, it covers around 45% of the EU’s greenhouse gas emissions.

3.2. Domestic carbon taxes

As an alternative to emissions trading, a government can levy a carbon tax on the distribution, sale or use of fossil fuels (or other sources of emissions), based on their carbon content. This has the effect of increasing the cost of those fuels and the goods or services created with them, encouraging businesses and individuals to switch to less carbon-intensive production and consumption.

The most prominent UK carbon tax is known as the Carbon Price Support. It applies only to installations in the UK power sector and it was introduced, in 2013, to augment the low carbon price signal UK power emitters faced under the EU ETS. The rate has doubled since it was introduced in 2013 from £9 to £18.05 per tonne of carbon dioxide-equivalent (tCO₂e) and this was set to increase to £30 (€33.85) by 2020. However, the UK Government has repeatedly frozen the price escalator and in 2014 decided to cap the Carbon Price Support at £18.08 (€20.40) until 2021.

The Total Carbon Price that UK power sector emitters face is comprised of the Carbon Price Support plus the price of EU ETS permits. In 2019 the average EU ETS permit price was approximately €24.50 (or £21¹). Therefore, in 2019 the Total Carbon Price in the UK amounted to approximately £39 tCO₂e.

Although at present the UK's carbon pricing is inconsistent across the economy, with different sectors experiencing varying effective carbon prices and – in some cases – overlapping policy instruments, the measures that are in place can be used as the basis for reform to improve future carbon pricing policies.

1 Using an average exchange rate for 2019 of 0.88 and data from <https://www.eex.com/en/market-data/environmental-markets/spot-market/european-emission-allowances>

4. The UK Government and devolved administrations response to the ‘Future of UK Carbon Pricing’ consultation

In May 2019 the UK Government and devolved administrations **consulted on the future of carbon pricing in the UK after Brexit**. The consultation received over 130 responses from a range of stakeholders. The UK Government and devolved administrations **published their response** to the consultation in June 2020, setting out their intended approach. The consultation will also be accompanied by a UK-wide ‘common framework’ to ensure consistency and coordination across the whole of the UK. While the common framework is expected imminently, the contents of this are as yet unknown.

In June 2019 the UK Government committed to reducing greenhouse gas emissions to net-zero by 2050, although there are different targets for the devolved administrations. The Scottish Government has legislated for net-zero targets by 2045, including emissions from international aviation, and the Welsh Government will bring forward legislation in 2021 to cut net emissions by at least 95% on 1990 levels by 2050. The UK Government and devolved administrations are, however, facing the implications of leaving the European Union.

The fact that the net-zero target is being established alongside the Brexit process presents an opportunity to reconsider options for pricing carbon, and hence the launch of the consultation. The **UK Government has stated** that the planned launch of the UK ETS will be in 2021 and the scope will be at least as ambitious as existing arrangements regarding the level of the price, the sectors that are covered and the exemptions that are granted. The UK’s carbon pricing system should also aim to support cost-effective emissions abatement across all of the UK, irrespective of the independent targets from each administration.

The UK Government and devolved administrations response to the ‘Future of UK Carbon Pricing’ consultation includes a number of aspects that warrant scrutiny. As it is not possible to provide a comprehensive overview of all aspects of the consultation response, this note highlights selected key aspects.

4.1. Linking

While the UK Government and devolved administrations retain a preference for a UK ETS linked to the EU ETS, the outcome will be determined by the success or

otherwise of the broader Brexit negotiations. Nevertheless, much of the discussion around the future of UK carbon pricing has focussed on whether it is possible to form a link with the EU ETS and what additional benefits this would bring.

Academic research shows that cost savings generated by emissions trading are far greater if the jurisdiction is part of a much bigger market.^{1,2} Accordingly, establishing a UK ETS that is linked to the EU ETS immediately, or as soon as is practicable, will continue to benefit the UK and devolved administrations in the future even though this may mean the UK becomes a 'rule-taker' with regard to EU ETS rules.

If this is unsuccessful, a UK ETS could evolve over time to consider linking in the future to other emissions trading systems. Although this would not be a optimal solution, **research by the Grantham Research Institute** highlights two types of gains from linking ETSs in two different jurisdictions, namely effort- and risk-sharing gains. These gains would also apply if linking to an ETSs other than the EU's. Effort-sharing gains derive from the differences across ETSs in the *expected* marginal cost of emissions reductions. Risk-sharing gains are generated by *unexpected* changes in the marginal abatement cost due to business cycles, weather and technology shocks.

The magnitude of effort- and risk-sharing gains from linking ETSs bilaterally can be substantial. Moreover, linking tends to deliver greater benefits to smaller systems. Therefore, in theory, a UK ETS linked to the EU ETS is a much better option than linking to a comparatively small or smaller ETS or to one that is not in regulatory alignment

Establishing a non-linked UK ETS involves opportunities and risks for the UK. On the one hand, the UK can re-optimize its system design swiftly and flexibly without seeking the approval of other EU member states. This process could be informed by the important lessons learned from the UK's participation in the EU ETS and more broadly from other emissions trading systems that have proliferated around the globe since the EU ETS was established in 2005.

On the other hand, significant divergence from the EU ETS's core design features will likely make linking negotiations with the EU more complex. It may cause delays in reaching a linking agreement, **result in a costly restricted linking arrangement**, or even preclude an agreement altogether, resulting in a standalone UK ETS.

Research shows that a standalone UK ETS is unlikely to generate as many benefits as a

UK ETS linked to the EU ETS and could be a costly options. This is because:

- Finding counterparties for permit transactions will be more difficult, reducing the number/volume of mutually beneficial transactions that would have taken place in a larger market;
- Fewer/smaller transactions will raise transaction costs; and
- Divergent prices in the UK ETS and EU ETS may have undesirable competitiveness implications for the UK.

Under these circumstances the UK may well be better off adopting a carbon tax that can allow firms to allocate their abatement effort optimally over time under the stable signal provided by the tax. In other words, the case for a carbon tax as the UK's main carbon pricing policy instrument is much stronger against the alternative of a standalone UK ETS that does not adjust to reduce these costs (e.g. by expanding sectoral coverage or using mechanisms that seeks to reduce divergence in prices from the EU), provided equivalent measures are in place to address competitiveness concerns that arise for a carbon tax.

4.2. Sectoral coverage

At present the consultation response rules out any immediate expansion of the sectors that are covered, although the **impact assessment recognises:**

...that there is a case for expanding carbon pricing, especially in the context of a net zero emissions target, and will therefore consider the option of expanding the scope to the most appropriate additional sectors in the first ETS review.

It said any changed to scope would be implemented no later than 2026.

The most significant sources of emissions that are currently not included in the EU ETS, albeit that are regulated otherwise, are transport and the residential and commercial heating sectors, which account for 21% and 13% of **EU28 greenhouse gas emissions**, respectively (including the UK before it left the EU). The scope of several other existing ETSs include these sectors, for example those of New Zealand, California and Quebec, and Chinese pilot schemes such as those in Shenzhen and Beijing. The South Korean system covers the residential and commercial heating sectors but excludes transport.

Following Brexit, the scope of a UK ETS could be expanded to include these sectors, to account for 24% (**transport**) and 18% (**residential and commercial heating**) of UK greenhouse gas emissions. The regulation could be applied upstream to minimise any undue burden on small emitters. An expanded scope

along these lines would have the benefit of providing a consistent carbon price signal in a broader range of sectors and increase market depth/liquidity for a standalone UK ETS. This is particularly important as in a UK-only ETS, the number of participants will decrease to 1,000 compared with roughly 11,000 in the EU ETS. Given the small size of the market, without an increase in coverage to increase depth and liquidity the market may be characterised by volatility and illiquidity.

Increasing the sectoral coverage would also reduce the burden on the complementary decarbonisation policies that agents in these sectors face. It has the drawback of making linking negotiations with the EU potentially more complex and brings up domestic distributional issues because carbon pricing in the residential sector without compensatory measures can cause particularly regressive impacts, disadvantaging poorer households. However, broadening the scope of carbon pricing is gaining traction. Significantly, the German Government has announced that from January 2021, a price of €25 tCO₂e will apply to its heating and transport sectors.

4.3. Auction Reserve Price

In the consultation response, the UK Government has said that to ensure a minimum level of ambition and price continuity, it will introduce an Auction Reserve Price (ARP). It will be set at £15 tCO₂e and will be a transitional arrangement until a Supply Adjustment Mechanism is established (see later section). The ARP effectively functions like a price floor – allowances will not be sold at bids lower than the auction reserve price and it is intended to ensure the ambition of price continuity is realised. But with EU ETS prices averaging £21 in 2019, and £26 for the month of July 2020 so far, the ARP is set significantly lower than EU ETS prices. The ARP could therefore be reviewed to maintain equivalence with the EU ETS price. However, the EU ETS does not have a floor price. Nonetheless, the appropriate level is one that ensures decarbonisation continues at pace.

While the ARP could be an effective way to ensure carbon price signals do not fall too low, **recent research by the Grantham Research Institute** suggests a price consistent with net-zero would begin at approximately £40 tCO₂e in 2020, raising to £75 in 2030.

4.4. Emissions cap

A notable design feature of the UK Government's proposed UK ETS is the setting of the emissions cap, which is 5% below the UK's notional share within the EU

ETS for Phase IV. The UK Government proposes that the initial cap will then be reduced annually by 4.2 million allowances. While this does signify increased ambition, the cap is still set at a level which may imply oversupply from the outset when comparing the UK's supply and demand of permits over the last seven years. This may suggest potential for oversupply in the early years but it does allow participants to build up hedging positions. The UK Government plans a further tightening of the cap, with the **consultation response stating** that it will "aim to implement changes to appropriately align the cap with a net zero trajectory by 2023 if possible, and no later than Jan. 2024". This measure would make the proposed UK ETS the first net-zero-aligned cap and trade system in the world.

There may be some drawbacks to making it easier to adjust the UK cap. **Greater flexibility may infer potential for political interference**, which could adversely affect the credibility of the UK Government's commitment to a given time profile for the emissions cap and introduce new uncertainties into the system. The introduction of new governance structures could be helpful in this regard. For example, the UK Committee on Climate Change could propose the cap with any deviation from the recommended trajectory requiring a vote in Parliament.

4.5. Competitiveness

Globally and in the UK, for sectors that face a carbon price significant exemptions (e.g. free allowances) dilute policy efficacy. Consequently, there is little evidence to date that carbon pricing has resulted in the relocation of the production of goods and services or investment in these products to other countries with less stringent climate policy, as companies have not needed to do this. This **outcome is consistent** with the economic literature assessing the competitive impact of environmental policy.

The UK Government has said that the policy of free allocation will continue in a UK ETS. The initial approach to allocating free allowances will be similar to that of Phase IV of the EU ETS, in order to ensure a smooth transition for participants to the planned 2021 launch of the UK ETS. In addition, to mitigate the impact of non-domestic consumers facing higher costs, eligible energy-intensive businesses will continue to receive compensation for the indirect carbon costs associated with the policy (up to 60% of the cost of carbon on wholesale prices).

That being said, despite higher ambition (demonstrated by the cap setting), higher forecast carbon prices and higher administration costs faced by participants, combined with no change in leakage provisions, the **Impact Assessment** that accompanies the consultation concludes that there are unlikely to be significant

impacts on business competitiveness as a result of the policy. Further work may be needed to assess if this holds true.

This is particularly pertinent for Wales given its business and emissions profile which leads to a large share of traded emissions – the iron and steel industry produces 56% of all Wales's business emissions and is Wales's second largest overall source of emissions. The **traded emissions for the UK** as a whole are 28.7%, but Wales accounts for the highest proportion of this at 46.8%, followed by England (25.4%), Scotland (25.3%) and Northern Ireland (18.9%). Strengthening carbon leakage measures must therefore be a core part of any carbon pricing reform to ensure that Wales is not disproportionately affected.

4.6. Cost Containment Mechanism

Linked to the issue of maintaining competitiveness is the Cost Containment Mechanism (CCM), which enables the UK Government to decide whether to intervene should very high prices occur. The UK Government sets out that in the first two years of a UK ETS, the CCM be designed to be more responsive to price strikes than the equivalent EU ETS mechanism. It is planned that the UK CCM will have faster time and price triggers to ensure an appropriate price corridor is maintained. In Year 3 however, the UK CCM mechanism will be harmonised with the EU ETS CCM.

Another measure featured in the consultation that indirectly affects price levels is the UK Supply Adjustment Mechanism (SAM), which broadly mirrors the EU ETS Market Stability Reserve (MSR). The SAM adjusts the number of allowances to be auctioned in certain years if the market is oversupplied with permits. This measure will not feature immediately in a UK ETS and the UK Government says it will launch a consultation on the design of a UK SAM in the event that it seeks to implement one.

Internationally, jurisdictions have been moving towards rule-based mechanisms that provide clearer signals to markets regarding intervention criteria. The application of the CCM and SAM needs to ensure there is no room for discretion. Therefore movement to a rule-based SAM and CCM should be supported.

4.7. Revenue recycling

Revenue recycling from emissions trading systems has in the past received less attention than revenue recycling from carbon taxes. However, there is much that can be learnt from how revenue is recycled from carbon taxes. Addressing the lack

of public support for carbon prices is becoming an ever more important concern as many governments commit to more ambitious emissions reduction goals. The low penetration of carbon pricing is in large part due to people's aversion to taxes generally, and to carbon taxes more specifically. Making carbon pricing more publicly and thus politically acceptable is therefore a key precondition for more stringent and effective climate action.

It is therefore important to establish how revenue recycling could both create real value to the economy and at the same time contribute to broad public support for reaching climate targets. There is a consensus in the academic literature that absorbing revenues into the general government budget is the worst way to raise public support for carbon pricing.^{3, 4, 5, 6} Countries with high carbon taxes, such as Sweden and Switzerland, were successful in their implementation because they used a mixed strategy of revenue recycling with revenues being used partly for direct compensation to citizens, partly for green infrastructure spending and partly for industry compensation. On balance, these options should be assessed as potential uses of revenue recycling in conjunction with allocating some revenue for an industrial decarbonisation fund.

While the UK Government's consultation response acknowledges the benefits of earmarking or hypothecating revenue as compensation for citizens, it states that "we do not propose to adopt it at this time".

5. Covid-19 and emissions trading systems

The impact of Covid-19 on the price of carbon illustrates just how important it is to build flexibility into cap-and-trade systems and this is something policymakers should remember for the design of the UK's post-Brexit emissions trading system. In light of the current shock, two features are particularly relevant and worth scrutinising.

- 1.** The Supply Adjustment Mechanism (SAM). In principle, the objective of a SAM is to make the standalone UK ETS responsive to shocks and, in the spirit of the EU ETS Market Stability Reserve, tackle unexpected supply–demand imbalances. Therefore, the factors that should determine the design of a standalone UK ETS SAM are fundamentally linked to the causes of possible market imbalances that may develop in the UK allowance market. With this in mind, if a consultation is launched on the design of a SAM, the Department for Business, Energy and Industrial Strategy (BEIS) should consult with UK stakeholders to identify the number of years it would take the SAM to absorb the potential surplus.
- 2.** The Auction Reserve Price (ARP). If the ARP is purely transitional until the SAM comes into effect (as the consultation response suggests), then the SAM would have to be consistent with the net-zero target. However, in the event that future linking of a UK ETS with its EU counterpart is unsuccessful, the ARP could act as an effective minimum price guarantee or price floor. In this regard, it is no longer about aiding the transition to a new linked ETS. Instead, a sufficiently ambitious ARP (e.g. more than £40 tCO₂e) can drive decarbonisation across the economy and may negate the need for an additional Carbon Price Support. Floor prices could provide an effective way of ensuring prices do not collapse when society faces another economic shock.

6. 'No-deal carbon emissions tax'

The **UK Government's 2018 budget** stated that if the UK were to depart from the EU emissions trading system in 2019, the UK Government would introduce a carbon emissions tax to replicate the ETS component. The tax would apply to all stationary installations currently participating in the EU ETS. A rate of £16 would apply to each tonne of carbon dioxide emitted over and above an installation's emissions allowance, which would be based on the installation's free allowances under the EU ETS.

The intentions set out in the Budget would maintain the current Carbon Price Support of £18/tCO₂e but create an additional new carbon tax of £16 tCO₂e. While the power sector would be exposed to both taxes (thus facing a total price of (£34 tCO₂e), the new £16/tCO₂e tax would only apply to EU ETS sectors. But crucially, the new £16 tCO₂e tax would be payable only above an installation's emissions allowance, therefore replicating free allowances from the current ETS and transposing them into a new tax arrangement.

The no-deal carbon tax rate, which is meant to reflect ETS prices, is currently lower than ETS prices. In 2019, the total carbon price paid by power sector installations was approximately £39 tCO₂e. For power sector participants, a no-deal carbon tax without an increasing price trajectory would therefore reduce their tax liability to £34 tCO₂e.

In the 2020 Budget, the UK Government announced it would publish a consultation on the design of a carbon emissions tax as an alternative to a UK ETS. This consultation has since been launched (July 2020) with the closing date for comments at the end of September 2020.

6.1. Implications for the devolved administrations

Under a carbon emissions tax, emissions will be reported in the same way as they are today, which is by the Environment Agency in England and by the devolved regulators in Wales (Natural Resources Wales) and Scotland.

Future UK carbon pricing is likely to raise substantially larger revenues than are considered today. The Impact Assessment for the consultation estimates between £4.5 billion and £10.2 billion in revenue from carbon pricing. However, if the coverage expands and a more aggressive Auction Reserve Price is adopted, the revenues could be even greater still. How the proceeds are used becomes increasingly important.

How this is spent is a politically sensitive issue. With regard to the revenue raised under a tax, the tax receipts would be reserved to HM Treasury and the devolved administrations would have no involvement. How any revenues feed through to the devolved administrations will be determined by the Chancellor of the day and through the application of the Barnett formula.

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