Annexes

Annex 1: Case studies of linking Emissions Trading Systems

The Annex gives further details of linking of emissions trading systems referred to in the assessment of options for the UK's relationship with the EU ETS.

Case study 1: EEA countries (Norway, Iceland and Liechtenstein) and the EU ETS

Why was it put in place (political/policy motivation)?

The aim of linking the Norwegian ETS with the EU ETS was to facilitate emissions trading between the two regions.

What is the form of linkage (e.g. allowances mutually acceptable)?

Norway started planning its ETS in 2001 and the system began in 2005. During its first phase (2005-2007), trading was one-way: Norwegian installations could purchase EUAs from the EU ETS but EU installations could not purchase Norwegian allowances.

In Phase II (2008-2012) Norway's ETS was linked to the EU ETS and included under an amended EU ETS cap. The link was confirmed in early 2009 after Norway's national allocation plan (NAP) was approved by the EFTA Surveillance Authority.[1] This enabled full trading of EUAs between Norway and the EU.

By the start of Phase III, the EU ETS legislation was harmonised and responsibility for producing NAPs fell to the European Free Trade Association Surveillance Authority.

What type of allowances are used in each market?

EUAs.

Who governs the linkage arrangements?

EU institutions in conjunction with the Norwegian Pollution Control Authority. Norway is a member of the European Economic Area (EEA) and European Free Trade Association (EFTA) and its participation in the EU ETS is therefore governed by the terms of these agreements which are overseen by the European Commission and EFTA Surveillance Authority.

When was linkage established? How long did it take to establish?

Norway joined the EU ETS in October 2007 and officially linked with the EU ETS in 2008 (at the start of Phase II). The Norwegian system was designed from the outset to be compatible with the EU ETS which meant linking the systems

[1] EDF, CDC Climat, Caisse de Depots & IETA. 2015. Norway: An Emissions Trading Case Study (link)

would be straightforward. In March 2006, the Norwegian Government accepted that the EU ETS directive can be included in the EEA agreement.

What features have enabled linkage?

The incorporation of EU ETS Directive (Directive 2003/87/EC as amended) into the EEA agreement. Norway was required to adopt this directive in order to participate in the EU ETS. In Phase II of the EU ETS the scope of the Norwegian ETS was widened to more closely match the EU ETS (offshore industry and wood processing were covered).

How large are the linked systems? (In millions of tonnes and relative to each other)

The average annual EU ETS cap for 2021-2030 is 1,550 $MtCO_2e$/year and we estimate the equivalent notional Norwegian cap at 17 $MtCO_2e$/year.

Outcomes for environmental effectiveness?

Given the brevity of Phase I of Norway's ETS, it is impossible to comment on how linking has affected the system's environmental effectiveness. Norway's emissions reduction targets continue to be more ambitions that those of the ETS which is reflected in its higher auctioning share and absence of free allocation to offshore industries. However, Norway allowed for greater use of offsets (20% of annual allowance total vs the EU's 13.4% of ETS cap during Phase 2). MRV processes in Norway are also less rigorous compared to those of the EU ETS.

Outcomes for economic efficiency?

Linking should makes reducing emissions cheaper, increase liquidity and lower transaction costs. As a result of joining the EU ETS, Norway has faced a loss or regulatory control as it is bound by EU legislation in this area. However, this would have had little material impact given its main trading partner is the EU which creates economic incentives to align policy.

Case study 2: Switzerland and the EU ETS

Why was it put in place (political/policy motivation)?

The aim of linking is to create fungibility between the EU and Swiss ETS's while minimizing distortions. At present, there is virtually no trading in the Swiss ETS. Switzerland has also identified lower cost emission reductions, enhanced liquidity, clearer price formation and price stability as expected benefits from the link.

For the EU, each link to the EU ETS lends political credibility to the market and validates Europe's approach to carbon pricing. Switzerland is also an emissions loophole for the aviation sector which the EU is keen to plug.

What is the form of linkage (e.g. allowances mutually acceptable)?

Switzerland has had a voluntary ETS since 2008. From 2013 participation was mandatory for large emitters. Linkage is expected to take the form of a bilateral agreement. Switzerland is signatory to EFTA but not the EEA.

What type of allowances are used in each market?

EUAs and Swiss allowances.

Who governs the linkage arrangements?

EU Institutions and the Swiss Federal Office of the Environment (FOEN).

When was linkage established? How long did it take to establish?

Exploratory talks between Switzerland and the EU about a linkage began in 2008. Article 25 of the EU Trading Directive allows the EU ETS to be linked to other ETSs under certain conditions. Negotiations started officially in 2010/11 and linkage was set to take place in 2013 but talks were put on hold by the EU due to concerns around the Swiss referendum over limiting immigration into the country.[2] By January 2016, negotiations had concluded and an agreement was initialed between Swiss and EU authorities. For the agreement to enter into force, it must be signed and ratified by both sides. The timetable for this is open.[3]

What features have enabled linkage?

The Swiss system will need to expand its coverage to match that of the ETS and must include aviation at the point at which the systems are officially linked.

How large are the linked systems? (In millions of tonnes and relative to each other)

The Swiss system has a cap of 5.25MtCO_2e in 2017.

Measures to address equity concerns (if any)?

Linkage in itself is designed to address competitiveness concerns of Swiss companies that face higher compliance costs under their own ETS relative to EU counterparts. Concerns raised during negotiations covered issues around the inclusion of aviation and the compatibility of the systems' trading registries. Observers are concerned about the possibility for Swiss entities to use large amounts of international offsets to cover their emissions which would dilute the overall ambition of the EU ETS. Like Norway, Swiss MRV is less stringent than with the EU ETS. Similarly, in making its system compatible (convergence on coverage) with the EU ETS, Switzerland has ceded some regulatory control to Brussels.

Case study 3: The Western Climate Initiative

Why was it put in place (political/policy motivation)?

For Quebec, linkage had the benefits of helping the region meet its emissions targets. Quebec has a much smaller population than California and the benefits of linkage appear to be limited for the latter. However, establishing an international linkage has value as a demonstration for potential future linkages. Linkage with Ontario, which has similar emissions levels to California, would likely reduce costs of abatement for both jurisdictions.

What is the form of linkage (e.g. allowances mutually acceptable)?

Both allowances and offsets are mutually acceptable.

What type of allowances are used in each market?

A single type of compliance unit is used in both jurisdictions.

Who governs the linkage arrangements?

[2] CarbonPulse. 2015. Switzerland, EU aim for ETS linking agreement before July (link)
[3] CarbonPulse. 2016. EU and Switzerland to link carbon markets after talks conclude (link)

The WCI board in collaboration with Ontario Ministry of Environment and Climate Change and California Air Resources Board (CARB).

When was linkage established? How long did it take to establish?

Between 2008-2010, WCI partners came up with guidelines and operating rules.[4] In 2012, A series of amendments to the California's system (and other WCI members) made linkage with other systems possible.[5] California and Quebec's ETSs were established the same year and in 2013 a linkage agreement between the two jurisdictions was signed, effective as of 2014 when the first joint auction was held.

In 2015, Ontario announced its intention to join the WCI. It intends to fully link its system to California and Québec in 2018.

What features have enabled linkage?

For the California-Quebec linkage to work, both parties had to amend their regulations to accept allowances and offsets generated in each other's jurisdictions.[6] The CARB was tasked with ensuring the linkage would not affect California's ability to enforce its own system and would not place additional liability on the state. A joint Consultation Committee was established under the 2013 a to monitor coordination of the systems. Both systems were required to ensure that offsets produced in their systems were of high integrity. The parties agreed to hold joint auctions, cooperate on regulation and a common auction platform and registry were set up.

How large are the linked systems? (In millions of tonnes and relative to each other)

In 2014, California's cap was 159.7 $MtCO_2e$, Quebec's was 23.20 $MtCO_2e$. Ontario's 2017 cap is 142 $MtCO_2e$.

Measures to address equity concerns (if any)?

Concerns about differing commitment levels on transparency and enforcement – mitigated through collaboration on critical elements (e.g. joint registry) and facilitation of information sharing (e.g. through establishing a joint committee and common approach to MRV).

California and Quebec assigned different liability for the environmental integrity of offsets: in CA, the buyer is liable whereas in Quebec, for each allowance that is invalidated a valid offset is retired.[7] Offsets in each jurisdiction also come from different sources.

The success of handling such concerns is ultimately driven by the compatibility of political aims.

Case Study 4: Proposed Australia EU ETS linkage

In August 2012, The Australian Federal Government and EU Commission agreed to link the forthcoming Australian ETS with the EU ETS. Australia's carbon pricing mechanism (CPM), which set a fixed price on emissions permits, was due to be transformed into an ETS in 2015.[8] However, the 2013 election saw the Australian Labour party government defeated and the system was scrapped by the incoming administration.

[4] Quebec Government. 2016. Expanding the Québec-California Carbon Market (link)
[5] Emissions-EU ETS.com. 2012. California and Québec Cap-and-Trade Programs Linking – Implications for Linkages' Design (link)
[6] R. Vaiciulis. 2013. Linking the California and Québec Emissions Trading Systems (link)
[7] Bailey *et al*. 2012. Issue Analysis: Linkage with Quebec in California's GHG Emissions Cap-and-Trade Market (link)
[8] (link)

The expected benefits of linking the system included *reducing the emissions abatement costs, increasing carbon market liquidity, stabilizing the carbon price, providing businesses with more opportunities to trade, and supporting international cooperation on global climate changes*.[8]

Initially, the agreement would allow Australian entities to use EUAs to comply with up to 50% of their emissions reduction obligations. By 2018, it was anticipated that two-way trading would be established. Coordination on issues such as MRV, use of offsets, competitiveness, and market oversight had not been addressed by the time the proposed link was invalidated.

Annex 2: Potential changes to the surplus in 2020 and Phase 4

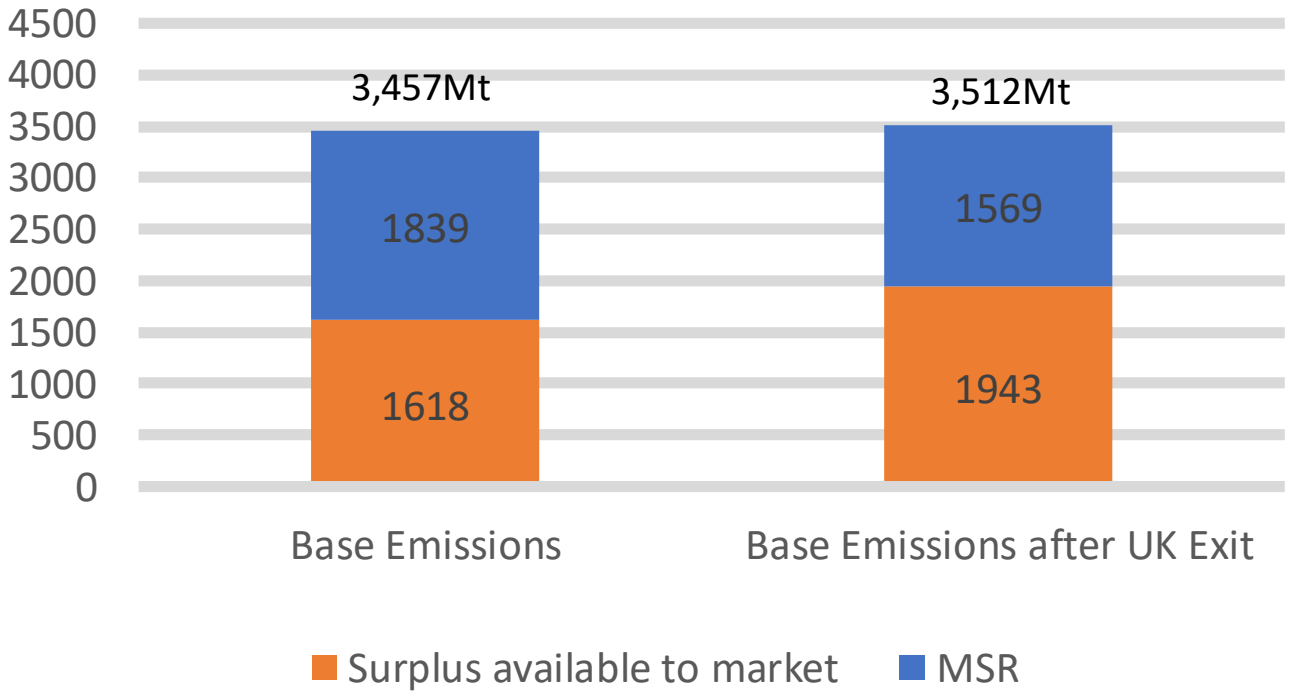
We currently project a total surplus of 3.5 Gt by 2020 with our base case emissions. A little under half of this total will be available to the market.

In the event of the UK leaving the EU ETS we need to account for potential changes to unallocated and backloaded allowances. We have assumed that allowances from the UK cannot be placed in the MSR after Brexit. Instead we assume that backloaded allowances that have come from UK auction volumes are auctioned in 2020 together with the UK share of any other unallocated allowances. The effect of this is to decrease the size of the MSR in 2020 by approximately 270 million tonnes.

The surplus available to the market correspondingly increases by the 270 million tonnes of backloaded and unallocated allowances no longer placed in the MSR. It also gains from an additional release from the UK share of the planned Phase 4 NER that we had previously assumed to be an increase in the Phase 4 cap. We now assume this to come to market in 2020 as well and total approximately 60 million tonnes.

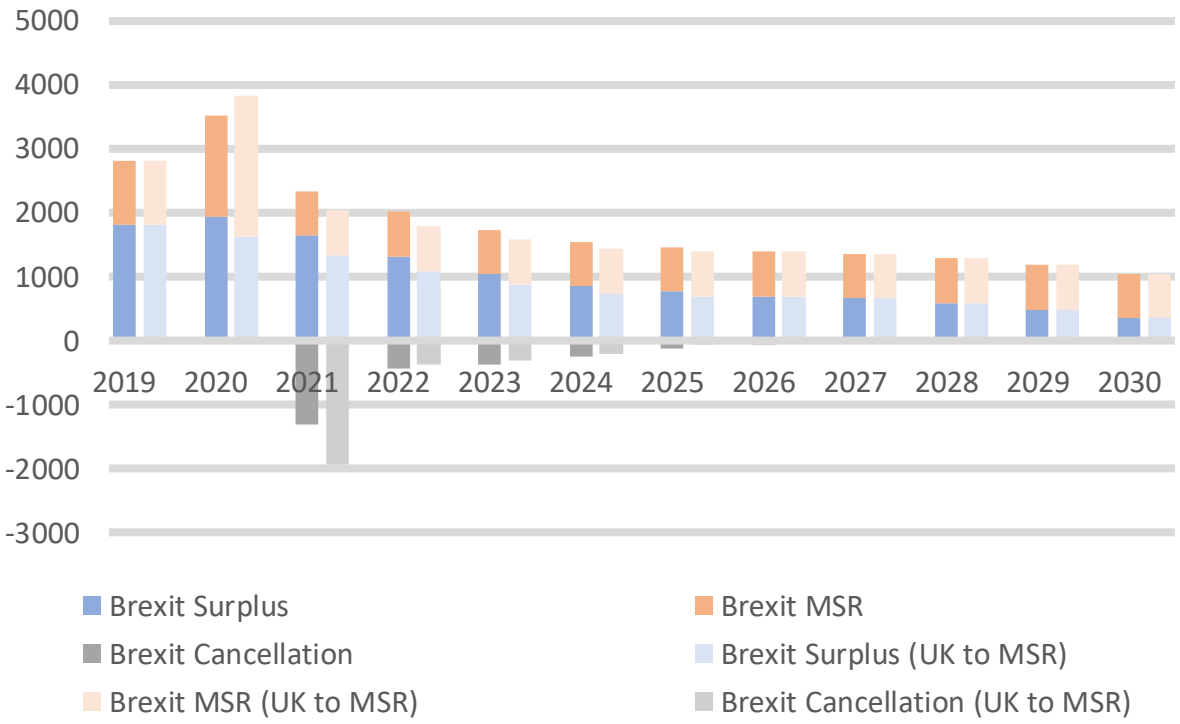
However we note that it is possible that as part of any final settlement the UK's backloaded allowances would be placed in the MSR even in the event of a UK exit from the EU ETS. The surplus available to market and MSR would then remain largely unchanged from the existing Base Case, other than potentially the addition of 60 million tonnes from the UK share of the NER.

Chart 13: Surplus in 2020 with and without Brexit assuming UK backloaded allowances are released to the market.

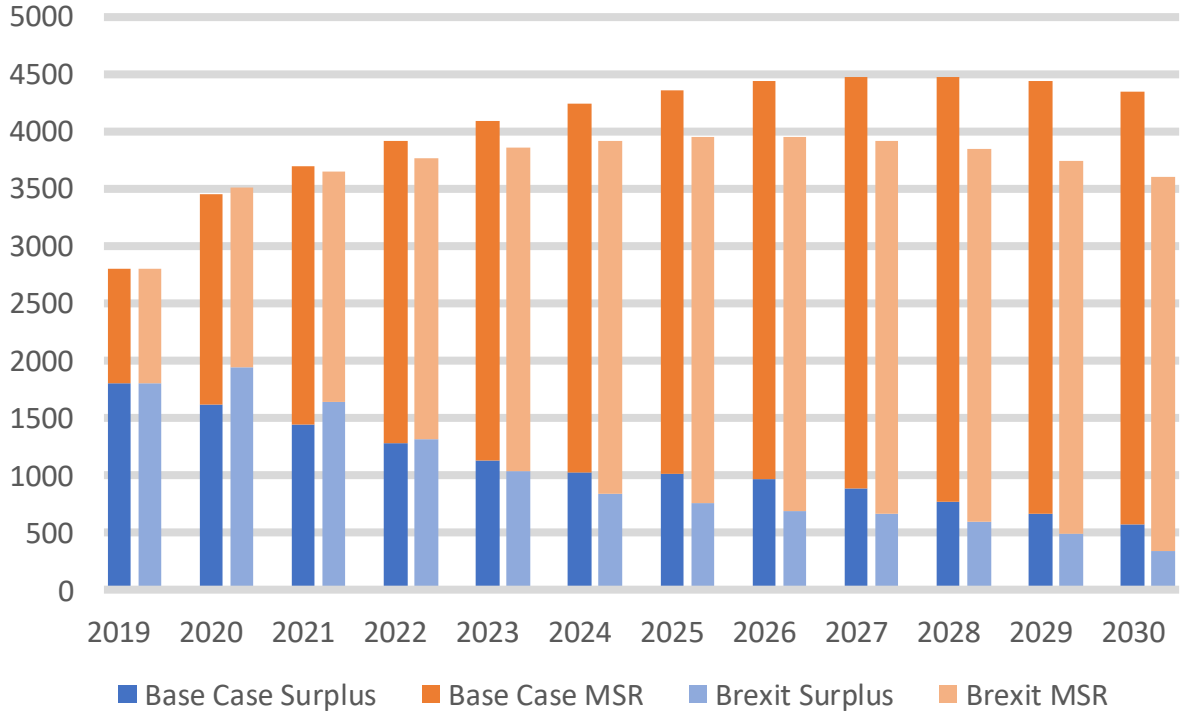


As part of our analysis of the surplus during the course of Phase 4 we have examined two sensitivities to assumptions.

The first sensitivity shows the effect of the UK's share of backloaded allowances being placed into the MSR. This makes almost no difference to the eventual surplus, as almost all those allowances not placed into the MSR in 2019 are absorbed during Phase 4 as part of the surplus and cancelled.



In the second shows the sensitivity to volumes from the MSR not being cancelled. This naturally results in a larger MSR. The MSR is smaller in the case of the UK leaving, because the system runs slightly tighter with the UK.



Annex 3: Approaches to setting the cap without the UK.

The approaches we have considered are:

1. Removing the UK from the 2005 emissions baseline and applying the same target reduction percentages to the end of phases 3 and 4. This is the approach adopted in this report.
2. Removing the UK allocations from the cap in 2020
3. Removing the UK allocation from the cap in 2010, and applying the same LRF to the remainder
4. Applying the global target reduction for the EU to the 2005 total to the covered sectors
5. Applying the global target for reduction to the EU to the 2005 total but with greater weighting towards he EU ETS. Approach 1 is a particular case of this.

In practice, data availability means that some assumptions need to be made in estimating the level of the cap. A comprehensive analysis of changes to the EU ETS cap would require the split of EU ETS and non-ETS emissions since 1990 by country under a constant (2013) scope. This is because there is a need to remove the UK (and EEA States) from the total emissions number and the target caps that are calculated using reported emissions. Unfortunately, data at this level of detail is not available, so approximations have to be used. The inconsistent use of baselines as either emissions or allocations under different scopes, further complicates any analysis. Estimates are therefore subject to some uncertainty, although not to an extent that materially affects conclusions.

Approach 1 – removing the UK from the 2005 baseline and applying the same reduction targets

EU 27 ETS emissions in 2005 can be calculated by removing UK emissions with the 2013 ETS scope as provided by the European Environment Agency. This equals 2074Mt. We can then calculate the respective caps for the EU 27 in 2020 and 2030 by using the same reduction percentages. These equal 1584Mt for 2020 and 1176Mt for 2030, both by definition represent the same percentage reductions as the EU 28 targets. This preserves the reduction commitments and ambition that have been agreed by the EU under the October 2014 Council Conclusions.

Approach 2 - Removing the UK allocations from the cap in 2020 to get a cap in 2020 excluding the UK, and applying the same LRF

UK allocations & auctioning volumes in 2020 could be removed from the EU 28 cap + EEA states (the current cap/LRF include EEA States). This would have the effect of creating a looser cap than Approach 1, therefore being in conflict with Council Conclusions.

Approach 3 - Breaking out the UK from the 2010 baseline, and applying the same LRF since then

The 2010 “baseline” is based on allocations (the cap) under a Phase 2 scope. We would need to use a notional 2010 allocation with under the Phase 3 scope in order to calculate a new LRF, however the former is not available.

Approach 4 - Applying the 40% from 1990 target to the EU, and keeping the same split as at present between the ESR and ETS (another Approach would be to increase the ETS weight)

A fourth way would be to apply the 40% reduction from the 1990 baseline, keeping the same split between the ETS and non-ETS sectors. If we take the actual split in 1990, the reduction target for the ETS would necessarily be lower since currently ETS sectors shoulder a larger portion of the overall reduction burden.

Approach 5 - as 4, but with greater weighting towards covered sectors