

Impacts of back-loading or permanently retiring EU ETS allowances

1. This document summarises preliminary analysis looking at the impact of back-loading or permanently retiring EU allowances on the carbon price and the consequential impact this may have on surplus allowances in the system and on EU ETS auction revenues. The primary focus of this document is on the impacts of permanently retiring allowances. Paragraph 7 sets out our high-level conclusions in relation to the impacts of the Commission's proposals to change the auctioning timetable ("back-loading").
2. The context for this analysis is that a significant surplus of allowances has manifested itself in the recent very low carbon prices in the EU ETS. This has weakened the incentives for abatement and for investment in low-carbon generation and technology. In its report 'The colour of growth', the CBI highlighted that the EU ETS is "not driving the low-carbon investments that are needed now to meet climate goals cost-effectively over the period to 2030 and beyond." The UK agrees with the European Commission that it is important to act now to rectify the current situation in the EU ETS.
3. The view of the UK is that any intervention in the EU ETS in the context of the current negotiations should be a one-off in order to provide the market with the certainty it needs to make its investment decisions. Such an intervention should also restore the environmental credibility of the EU ETS. We also believe it will be important for the Commission to consider possible risks of carbon leakage associated with reforms to the EU ETS.
4. This analysis has been produced to aid initial policy discussions, taking account of the implications for investment in low carbon technology and generation, the implications for industry and the implications for Member States. This may be revised and updated in future. These estimates should be taken to be indicative only of the approximate impacts of an alteration of the auctioning profile or a lower supply of allowances in the market. **They do not constitute price or revenue forecasts and no responsibility is taken for any liability arising from the use of these estimates.**
5. The revenue estimates or statements in relation to revenue in this document have not been produced as part of the UK Treasury's ordinary costing process for Budget measures, or been scrutinised by The Office for Budget Responsibility, which provides independent and authoritative analysis of the UK's public finances.
6. The effects on the carbon price have been derived using a fundamentals-based model of the market for EU allowances, which considers equilibrium between demand for and supply of abatement. The modelling has an horizon

that extends to 2020 and incorporates some myopia on the part of market participants, which implies that they do not have complete information about the future.

High-level conclusions in relation to back-loading EU ETS allowances

7. Our preliminary analysis of back-loading suggests that the modelled carbon price in scenarios with back-loading 400-1,200 MtCO₂ allowances (as proposed by the Commission) is higher as compared to scenarios without back-loading in the early years as auctioning levels are reduced, but lower in later years as auctioning levels are increased and allowances returned to the market. The modelled carbon price in scenarios with back-loading is marginally lower on average over Phase III (2013-2020) as compared to scenarios without back-loading. Note, however, that actual price impacts may be stronger than indicated by these preliminary estimates as a result of using a model which ends in 2020, so that any negative consequences on the price from returning allowances may be accentuated. Backloading in isolation will not alter the number of EU allowances auctioned over the period (unlike permanently retiring EU allowances), and as a consequence a marginally lower average price over Phase III would translate into lower EU ETS auction revenues overall.

Impacts of permanently retiring EU ETS allowances

8. The change in EU wide auction volumes underlying the estimates in this note is as listed in the table under paragraph 17 below and is largely based on the options to revise the auction time profile listed in the European Commission's Staff Working Document¹, though we also look at the implications of eliminating the total estimated Phase II surplus in the document of 1,700 MtCO₂. Impacts on the carbon price have been derived under scenarios involving permanently retiring different volumes of allowances in early years of Phase III of the EU ETS.

Price impacts

9. If allowances are cancelled and permanently removed from the market, there is a sustained positive impact on the carbon price with a consistent rise in prices over all years up to 2020. The average modelled Phase III price is €4 to €24 higher when allowances are cancelled as compared to scenarios without cancellation (or any equivalent structural reform) for the range of volumes considered. Note, however, that actual price impacts may be weaker than indicated by these preliminary estimates, again as a result of using a model

¹ Commission Staff Working Document, *Information provided on the functioning of the EU Emissions Trading System, the volumes of greenhouse gas emission allowances auctioned and freely allocated and the impact on the surplus of allowances in the period up to 2020*

which ends in 2020. For instance if participants have a long-term view of the market and take expectations about the distant future into account, this will have the effect of smoothing prices over time. Similarly, if business as usual emissions were significantly lower than those used in this analysis, modelled prices in a scenario without cancellation could be significantly lower, thus reducing the scope for the price differences set out in the table below.

Volume of allowances cancelled in MtCO₂	Estimated average difference in modelled prices over 2013-2020 in scenarios with and without cancellation of allowances
400	€ 4-7
900	€ 9-13
1,200	€ 16-17
1,700	€ 22-25

Surplus allowances

10. According to the Staff Working Document, the volume of unused surplus allowances in the EU ETS over 2008-2011 is 955 MtCO₂. Verified emissions data indicate that most industrial sectors have surpluses over this period, with production of pig iron or steel and production of cement clinker or lime having the largest surpluses. Estimates of surpluses, measured as free allocation plus surrendered credits less verified emissions, for the period 2008-2011 for different sectors are as below.

Sector	Free allocation plus surrendered credits less verified emissions for the EU over 2008-2011, in MtCO₂
Production of pig iron or steel	364
Production of cement clinker or lime	268
Mineral oil refineries	68
Production of pulp, paper and board	54
Manufacture of ceramic products by firing	40
Metal ore roasting or sintering installations	34
Manufacture of glass including glass fibre	26
Coke ovens	19
Combustion	-213

Source: EU ETS Compliance Database compiled by Bloomberg New Energy Finance based on CITL data

11. As argued in the Commission Staff Working Document, a higher build up of surpluses is likely in 2012 as compared to previous years. The Staff Working Document also considers scenarios for surplus development in future years in which the surplus reaches about 1.7 GtCO₂ by the end of Phase II (2012) and exceeds 2.0 GtCO₂ by the end of Phase III (2020). Permanently retiring allowances will serve to remove some of this surplus.

12. Looking at the period up to 2020, some sectors are expected to receive allowances in excess of their projected emissions. Forecasts from Bloomberg New Energy Finance indicate that the amount of free allocation will exceed emissions for cement and metals sectors cumulatively up to 2020. Even though other industrial sectors are not projected to have cumulative surpluses, they are still expected to receive a large proportion of their emissions in the form of free allocation as shown below.

Sector	Free allocation as a proportion of projected emissions for the EU cumulatively over 2008-2020
Power	39%
Heating	52%
Refining	98%
Metals	144%
Cement and lime	120%
Aviation	72%
Other industries	89%

Source: Bloomberg New Energy Finance, September 2012. Note that this sector classification does not exactly match the CITL classification in the previous table.

13. Permanently retiring allowances, by raising the carbon price, will have the effect of increasing the value of unused allowances held by those sectors with surpluses but increase the costs of complying with the EU ETS for those sectors that need to purchase allowances over and above their free allocation. However, as indicated above, the level of free allocation is likely to limit any increase in compliance costs.

EU ETS auctions revenue impacts

14. Permanently retiring allowances would affect EU ETS auction revenues received by Member States through two channels:
- a change in the price at which these allowances are sold; and
 - a change in the quantity of allowances being sold
15. The indicative impact on EU ETS auction revenues over the period 2013-2020 as a result of removing between 400 and 1,700 MtCO₂ are shown in the table below. We expect permanently removing 400-1,700 Mt CO₂ allowances would have positive consequences for the EU ETS auctioning revenues of all Member States, and for auctioning revenues in the EU as a whole. This is because the impact of the sustained increase in price over Phase III is large enough in all scenarios to offset the impact of a fall in the volume of allowances being auctioned.
16. These indicative estimates show the difference between modelled revenues in scenarios with and without cancellation of allowances. As explained in paragraph 14, the change in revenue due to cancellation of allowances arises

from a change in carbon prices and a change in quantities of allowances auctioned. The assumed change in prices is the same as the difference in prices in scenarios with and without cancellation of allowances as outlined in paragraph 9 of this note. The assumed change in the quantity of allowances auctioned is equal to the difference in auction volumes between scenarios with and without cancellation of allowances. At the EU level, the change in auction volumes ranges from 400 to 1200 MtCO₂ across different scenarios. This total has been disaggregated into the change in auction volumes for different Member States based on their shares of the EU-wide auction pot. The estimates below have been produced using this simple methodology.

17. These estimates consider only the indicative impact on EU ETS auction revenues in isolation. They do not make any assumptions about fiscal policies in different Member States, and do not consider the potential feed through impacts on other taxes imposed by Member States, which could be negatively affected. In the case of the UK the existence of the carbon price floor policy means that as a result of changes in the EUA price roughly the same amount is lost through lower tax rates applied under the carbon price floor policy.

Change in EU-wide auction volumes, in MtCO₂, by volume retired

400m EU Allowances retired	2013	2014	2015	2016-2020
Change in EU-wide auction volumes (in MtCO ₂)	-200	-150	-50	0
Change in EU-wide average carbon price 2013-2020	€5.32 (annual range: €4.10-6.74)			

900m EU Allowances retired	2013	2014	2015	2016-2020
Change in EU-wide auction volumes (in MtCO ₂)	-400	-300	-200	0
Change in EU-wide average annual carbon price	€11.33 (annual range: €9.19-12.52)			

1,200m EU Allowances retired	2013	2014	2015	2016-2020
Change in EU-wide auction volumes (in MtCO ₂)	-550	-400	-250	0
Change in EU-wide average annual	€16.82 (annual range: €16.36-17.45)			

1,700m EU Allowances retired	2013	2014	2015	2016-2020
Change in EU-wide auction volumes (in MtCO ₂)	-800	-550	-350	0
Change in EU-wide average annual	€24.49 (annual range: €21.52-25.45)			

Resultant revenue impact by Member State

Country	Current share of auction pot (%)	400Mt EU Allowances retired		900Mt EU Allowances retired		1,200Mt EU Allowances retired		1,700Mt EU Allowances retired	
		Volume of EU Allowances excl. Retired (Mt)	Change in national revenues (2013-2020) in €m	Volume of EU Allowances excl. Retired (Mt)	Change in national revenues (2013-2020) in €m	Volume of EU Allowances excl. Retired (Mt)	Change in national revenues (2013-2020) in €m	Volume of EU Allowances excl. Retired (Mt)	Change in national revenues (2013-2020) in €m
Belgium	2.48%	243	1,223	231	2,453	224	3,556	211	4,855
Bulgaria	2.73%	268	1,345	254	2,699	246	3,911	232	5,340
Czech Republic	4.59%	450	2,259	427	4,531	413	6,567	390	8,967
Denmark	1.23%	120	604	114	1,211	110	1,756	104	2,397
Germany	19.61%	1922	9,659	1824	19,376	1765	28,079	1667	38,340
Estonia	0.89%	87	438	83	879	80	1,274	76	1,740
Ireland	0.92%	90	452	85	906	83	1,313	78	1,793
Greece	3.40%	333	1,674	316	3,358	306	4,866	289	6,644
Spain	8.46%	829	4,165	787	8,354	761	12,107	719	16,531
France	5.36%	526	2,641	499	5,297	483	7,677	456	10,482
Italy	9.44%	925	4,649	878	9,325	850	13,513	802	18,451
Cyprus	0.26%	25	126	24	253	23	367	22	501
Latvia	0.26%	26	129	24	259	24	375	22	512
Lithuania	0.53%	52	262	49	525	48	760	45	1,038
Luxembourg	0.12%	12	58	11	117	11	169	10	231
Hungary	1.47%	144	723	137	1,451	132	2,102	125	2,870
Malta	0.10%	10	49	9	99	9	143	9	196
Netherlands	3.28%	322	1,617	305	3,243	295	4,700	279	6,417
Austria	1.36%	134	671	127	1,347	123	1,952	116	2,665
Poland	12.25%	1201	6,033	1139	12,102	1103	17,539	1041	23,948

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Portugal	1.72%	169	848	160	1,701	155	2,464	146	3,365
Romania	4.90%	480	2,413	456	4,840	441	7,014	416	9,577
Slovenia	0.43%	42	213	40	428	39	620	37	847
Slovakia	1.50%	147	741	140	1,486	135	2,154	128	2,941
Finland	1.64%	160	806	152	1,618	147	2,344	139	3,201
Sweden	0.87%	85	430	81	862	79	1,249	74	1,705
United Kingdom	10.22%	1001	5,032	950	10,093	920	14,628	869	19,973

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