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COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

Commission Regulation (EU) No 176/2014 of 25 February 2014

amending Regulation (EU) No 1031/2010 in particular to determine the volumes of greenhouse gas emission allowances to be auctioned in 2013-2020

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1. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

1.1. Policy context

The EU Emissions Trading System (EU ETS) has produced since its start an EU-wide carbon price signal that drives daily operational and strategic investment decisions delivering emission reductions across parts of the EU economy that are responsible for half the EU's greenhouse gas (GHG) emissions.

The market is generally considered to be based on a well-functioning infrastructure. Part of this infrastructure relates to the modalities for auctioning of emissions allowances, where the EU ETS Directive[1] confers implementing powers to the Commission, notably through the adoption of a Regulation on "the timing, administration and other aspects" of auctioning (Auctioning Regulation)[2]. The Auctioning Regulation has already been amended once, bringing forward an amount of auctioning of phase 3 allowances in order to accommodate for hedging demand for sales in phase 3 in the EU ETS towards the end of phase 2. The Directive is being clarified through a proposed Decision to amend it[3] to confirm this ability of the Commission to change the timing of auctioning and thus adopt with full legal certainty an additional change of the timing urgently required by the carbon market.

The comprehensive impact assessment work performed in the past for the Auctioning Regulation remains valid[4]. The Auctioning Regulation provides for the volumes of allowances to be auctioned each year (so-called auctioning time profile), after deducting the allocation given free of charge from the Union-wide quantity of allowances issued in the same year. This proportionate impact assessment addresses only the impact of alternative time profiles. In particular, it assesses alternatives with a decrease of the annual auctioning volume in the early years of phase 3[5] and a corresponding increase in the later years (so-called back-loading).

This proportionate impact assessment complements the assessment already undertaken in the 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*[6] (from hereon referred to as the "*Staff Working Document on the functioning of the carbon market*"). It includes additional input received during the stakeholder consultation.

The Staff Working Document on the functioning of the carbon market already includes an analysis of the imbalance between the supply and demand in EU ETS that materialised in

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1 Directive 2003/87/EC

2 Commission Regulation (EU) No 1031/2010

3 COM(2012) 416 final: Proposal for a Decision of the European Parliament and of the Council amending Directive 2003/87/EC clarifying provisions on the timing of auctions of greenhouse gas allowances

4 Commission Staff Working Document accompanying the Commission Regulation on the timing, administration and other aspects of auctioning of greenhouse gas emission allowances pursuant to Article 10(4) of Directive 2003/87/EC, 08.02.2010
http://ec.europa.eu/governance/impact/ia_carried_out/docs/ia_2010/sec_2010_1369_en.pdf

5 The first trading period of the EU ETS or phase 1 refers to the period 2005 to 2007, the second trading period or phase 2 to the period 2008 to 2012, the third trading period or phase 3 to the period 2013 to 2020 and the fourth trading period or phase 4 to the period 2021 to 2028.

6 SWD(2012) 234 final

phase 2 (period from 2008 to 2012), how the transition from phase 2 to phase 3 (period from 2013 to 2020) is expected to impact this imbalance, and impacts of some options for back-loading.

To gather early views by Member States' experts, the Commission has invited the Climate Change Committee to consider a draft for a future amendment to the Auctioning Regulation and indicate their view on the appropriate action to be taken, including the volume of auctioned allowances that should be back-loaded, before the end of this year. The Climate Change Committee meeting considered the draft for the first time on 19 September 2012. No final conclusions were formulated. Member States seem to agree factually with the Commission's analysis showing a rapid build-up of the surplus. Opinions on if and how this should be addressed are not conclusive. Many Member States expressed the need to see the proportionate impact assessment and a report on structural measures before they can take a final position. The Climate Change Committee will continue to consider the draft.

1.2. Subsidiarity

The EU Emissions Trading System (EU ETS) is an EU policy instrument that from phase 3 onwards has harmonised allocation procedures both for allowances allocated for free and allowances auctioned. Change of the timing of any of these can only be implemented through proposals by the Commission to change the Directive itself or any of its implementing provisions.

1.3. Services involved

Directorate-General for Climate Action (DG CLIMA) took the lead on this proportionate impact assessment, with other Commission services (Secretariat-General, Legal Service, DG Competition, DG Economic and Financial Affairs, DG Energy, DG Enterprise and Industry, DG Environment, DG Internal Market and Services, DG Mobility and Transport, DG Research and Innovation, DG Taxation and Customs Union, DG Trade, the Joint Research Centre and the European Anti-Fraud Office) having been consulted. An inter service meeting was organised on 12 September 2012 and comments received by 18 September 2012 which were considered when finalising this proportionate impact assessment.

1.4. Response to the opinion of the Impact Assessment Board

The impact assessment was presented to the Impact Assessment Board on 17 October 2012. The board gave a positive opinion, acknowledging the work carried out but also recommending to improve it further. Below a summary is given of the changes made following the recommendations of the board.

Section 1.1 on policy context was amended giving more context to the proposal for a Decision to amend the ETS directive with the aim to clarify that the Commission can change the auctioning timing[7].

A new section 1.2 was included on subsidiarity.

Section 1.5 on the consultation of the stakeholders was further elaborated to clarify better the significant differences in opinions and concerns by stakeholders regarding backloading.

[7] COM(2012) 416 final

Furthermore as requested by the impact assessment board, examples of stakeholder comments were included throughout the report that do not support the proposed options.

The problem definition in section 2 was further elaborated explaining better why the current market environment can negatively affect investment decisions.

It also briefly looks at why other types of measures to address the temporary imbalance of supply and demand, such as changing the timing of free allocation or the inflow of JI CDM credits, are not considered. Additionally it is clarified that this impact assessment does not consider any structural measures to address the build-up of a surplus in itself.

The text was adapted to better explain what the baseline option is to which other options are compared to assess the impact of the policy proposal but the text was not expanded by including significant sections of the Staff Working Document on the functioning of the carbon market.

Finally to improve clarity on which level of backloading is most appropriate to address the current rapid build-up of allowances in the transition of phase 2 to phase 3, even without addressing the build-up in a structural manner, a table with options was added in section 5 on the comparison of options and conclusions. This table summarises more clearly the advantages and disadvantages of each option, evaluating them against the 'baseline' option of no change in the auctioning timing. This final section was also elaborated to clarify the monitoring and evaluation arrangements and further process to follow up this measure.

1.5. Consultation of stakeholders

The Commission has consulted stakeholders on their views on the draft for a future amendment of the Auctioning Regulation and the amount of auctioned allowances which should be back-loaded through an online consultation that ended on 16 October 2012. The consultation was open to all stakeholders for twelve weeks, accessible via the single access point on the internet[8]. A summary and the individual responses are published on the *Climate Action* website of the European Commission.[9]

The expressed views have been considered in the context of this proportionate impact assessment.

In total, 147 contributions have been submitted via the online consultation website and four additional contributions have been sent to the Commission[10]. Out of these, 92 were from registered organisations, with most active participation from professional associations and companies (79), as well as from non-governmental organisations (10), analysts/consultants (2) and a think tank. 21 contributions were from citizens (although 3 on behalf of an organisation). 33 were individual contributions from unregistered stakeholders and five from public authorities.

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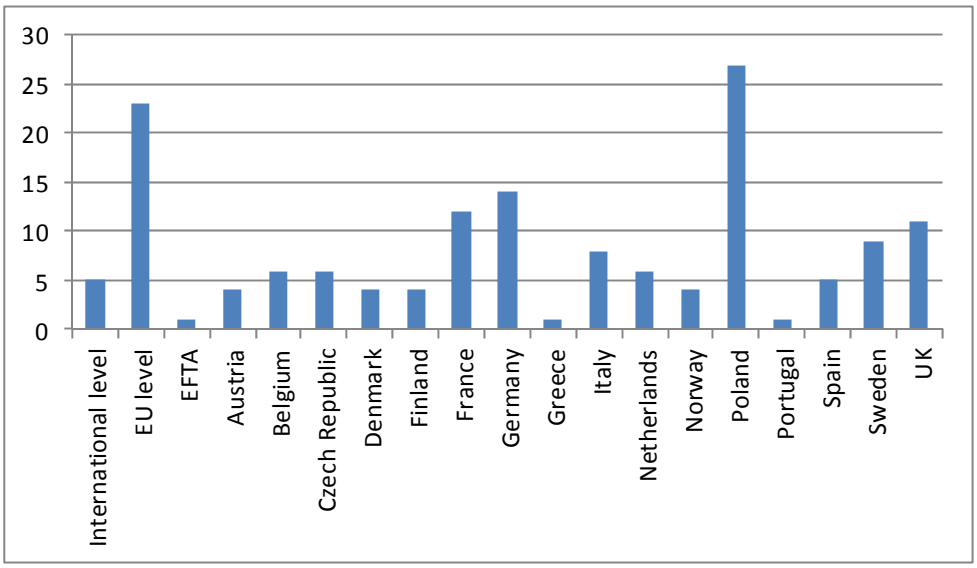
8 http://ec.europa.eu/yourvoice/consultations/index_en.htm

9 http://ec.europa.eu/clima/consultations/0016/index_en.htm , this includes a number of responses that were sent directly to DG CLIMA.

10 A number of responses have been submitted after the deadline. This impact assessment takes into account all late responses received until 17 November 2012, i.e. responses from the British Glass Manufacturers' Association, Cerame-Unie, Climate Action Network Europe and the Confederation of Swedish Enterprise. Additional responses that may have been submitted after the date might still be posted on the consultation website.

Most responses have been received from Poland (27) - large majority from citizens, followed by EU-level organisations (23), and Germany (14) - large majority from registered organisations. See Figure 1 for a complete geographical breakdown.

Figure 1: Received contributions from stakeholders by region/country



The responses reveal a broad support of the central role played by the EU ETS as a market instrument in the EU climate policy. A number of stakeholders point out that the (economic) reality has departed significantly from the modelling that informed the original cap-setting. Subject to the interests involved, opinions differ as to how important it is to take short-term measures to address this.

Several stakeholders, mostly from the energy or power sector, support the envisaged proposal for a short-term measure in the EU ETS to amend the auctioning time profile, arguing that the combination of the present regulatory features and the unprecedented economic and financial crisis created an ill-balanced supply pattern of emission allowances which will carry on into 2013 and Phase 3, which should be addressed. The Climate Markets and Investment Association confirms that the current imbalance in the EU ETS's supply pattern has had a profoundly negative impact on the low carbon investment signal the EU ETS is sending and will continue to do so unless the supply imbalance is addressed.[11] One stakeholder notes that the current price levels have created fears of a decrease in liquidity, as many intermediaries may exit the market.[12] The very weak price level seen lately in the EU ETS should be addressed as soon as possible.[13] There are also some industry voices calling for action. For example, Alstom argues that failure to act immediately threatens jobs and growth.[14]

The electricity industry believes that the EU ETS today is at risk of being undermined and replaced by other policy instruments. They would prefer permanent structural measures but can support phase 3 back-loading conditional on a line-of-sight through to decisions on a

11 Climate Markets and Investment Association, contribution to the online consultation
12 Centre for European Policy Studies, Carbon Market Forum, contribution to the online consultation
13 Royal Norwegian Ministry of Environment, letter from the Minister of 4 October 2012
14 Alstom, contribution to the online consultation

2030 target and beyond.[15] Back-loading should act as a first step in structural measures to strengthen and reposition the ETS as the key instrument to address carbon emissions.[16]

The five public authorities[17] that sent in a reply are generally supportive of the Commission's draft for a future amendment as a proper measure to reduce the imbalance between the supply of and demand for allowances and give an immediate price signal to the carbon market. Some point out that this should be taken with the full involvement of Member States and it should be considered as an exceptional one-off measure.

Out of the stakeholders supporting the envisaged proposal, some commented specifically on the amount of allowances which should be back-loaded. A number of stakeholders argue that the number of allowances to be withdrawn in the immediate future should be no less than 1.4 billion of allowances, as proposed by the European Parliament's Environment Committee in December 2011. Several stakeholders support the large change option from the Staff Working Document to back-load a total of 1200 million allowances in 2013-2015 to maximise the effect of back-loading. Some stakeholders said that the amount should be higher than the range assessed in the Staff Working Document on the functioning of the carbon market (400-1200 million allowances). For example, one stakeholder recommends back-loading of 1230 million allowances in the first two years of phase 3.[18] E3G cite an estimate for the surplus of above 2.1 billion allowances and considers that the range for back-loading allowances must therefore be increased.[19] Sandbag's analysis supports removing 2.2 billion allowances from phase 3 to restore the levels of scarcity envisaged at the time the cap was set.[20] SSE plc believe that an amount of 2.6 billion allowances is required to restore balance to the system.[21]

The auctioning is advised to be postponed to as late as possible and the volumes reintroduced not before 2018, due to the huge surplus of allowances.[22]

More guidance is sought by some stakeholders on the proposal for a Decision to amend the EU ETS Directive, clarifying the conditions in which the Commission will use the option to change the auction time profile.[23]

Other comments express the view that a draft amendment would constitute in practice a market intervention, whereby the price of emission allowances would be increased artificially in the period between 2013 and 2015. The contributions from citizens overlap to a great extent with the views in favour of maintaining the current auction time profile, often including also concerns on the potential impact on electricity prices, competitiveness and carbon leakage. Similarly some stakeholders underlined that higher carbon price may be detrimental to certain energy-intensive industries which are already facing an economic crisis and competing against imports which do not face any extra costs for carbon emissions. For

15 E.g. Eurelectric, contribution to the online consultation

16 Eneco, contribution to the online consultation

17 Czech Republic, Italy, EEA EFTA States Working Group on the Environment, Royal Norwegian Ministry of Environment, and Port of Rotterdam Authority and the Rotterdam Climate Initiative, contributions to the online consultation

18 Climate Markets and Investment Association, contribution to the online consultation

19 E3G, contribution to the online consultation

20 Sandbag, contribution to the online consultation

21 SSE plc, contribution to the online consultation

22 Danish Energy Association, contribution to the online consultation

23 Eurelectric, contribution to the online consultation

example, in the view of Katowice Coal Holding, back-loading would have a strong impact on the cost of electricity generation in Poland[24].

Business associations underline that prior to a long-term view being developed, short-term measures, such as changes to the EU ETS Auctioning Regulation, must be avoided as these would interfere with a more constructive discussion on how to achieve a structural solution.[25] The Association of European Airlines states that the inclusion of international aviation in the EU ETS has already triggered strong objections and threats of counter-measures from non-European governments and stakeholders, which would see a change in the auction time profile as a manipulation of carbon prices, and thus does not support changing the Auctioning Regulation.[26] According to the International Association of Oil and Gas Producers, any measure must be a result of an open transparent process following a full assessment of the dimensions and longevity of the problem.[27]

A number of stakeholders suggest concrete long-term solutions to address the imbalances, such as a permanent retirement of allowances, a greater annual linear reduction factor, and a clarification of the long-term trajectory of the cap for phase 4 (2021-2028) and beyond. Much greater scarcity in the number of allowances is regarded as required for the EU ETS to deter carbon intensive investments and practices and avoiding locking in the EU with carbon intensive investment in the energy and energy-intensive sectors.[28] BusinessEurope has called on EU policy-makers to start an open debate, involving all stakeholders, on the level of ambition for the EU ETS post 2020.[29]

One stakeholder notes that backloading will provide time for a consultation and possible preparation of legislative proposals on structural measures for the EU ETS.[30]

The Confederation of Employers and Industries of Spain provided some comments on the Staff Working Document on the functioning of the carbon market, including that it contains no expectations of economic recovery in the Member States or the EU.[31]

According to several citizens, there is no real proof that the greenhouse gases produced in industrial installations affect the climate.

2. PROBLEM DEFINITION

The EU ETS as the end of 2011 had a surplus of almost 1 billion allowances[32].

This surplus is expected to continue to grow. The likely continued impact of the economic crisis is a strong driver for this. Other elements contribute too such as newly adopted energy

24 Katowice Coal Holding, contribution to the online consultation
25 BusinessEurope, contribution to the online consultation
26 Association of European Airlines, contribution to the online consultation
27 International Association of Oil and Gas Producers, contribution to the online consultation
28 European Environmental Bureau, contribution to the online consultation
29 BusinessEurope, contribution to the online consultation
30 E3G, contribution to the online consultation
31 Confederation of Employers and Industries of Spain, contribution to the online consultation
32 Surplus is defined as the difference between the cumulative amount of allowances available for compliance at the end of a given year, and the cumulative amount of allowances effectively used for compliance with the emissions up to that given year.

efficiency measures, the penetration rate of renewables or the evolution of the high energy prices. Overall a surplus is expected by 2020 in the order of magnitude of 2 billion[33].

The rate of economic recovery will influence the exact magnitude of the overall surplus by 2020. The aim of this proportionate impact assessment is not to address the problems related to this build-up of the structural surplus by the end of phase 3. The impact assessment rather looks at the problem related to exceptional rapid build-up in the next 2 years during the transition from phase 2 into phase 3. This surplus has been building up due to allocation levels in the National Allocation Plans higher than the emission levels in the ETS, but will see, in particular a rapid increase in the transition from phase 2 into phase 3 due to a number of regulatory provisions specific to the transition. They include:

- part of the leftover of allowances in the national new entrant reserves for phase 2 will be sold by Member State at the end of phase 2;
- the early auctioning of 120 million of phase 3 allowances in the 4th quarter of 2012;
- the sale of allowances for the NER300 programme over 2012 and 2013;
- a large inflow of international credits for compliance purposes at the end of phase 2 given that certain type of credits cannot be used for compliance from phase 3 onwards.

Figure 2 provides an illustration of the rapid build-up of the surplus in the transition from phase 2 to phase 3 giving the current regulatory provisions.

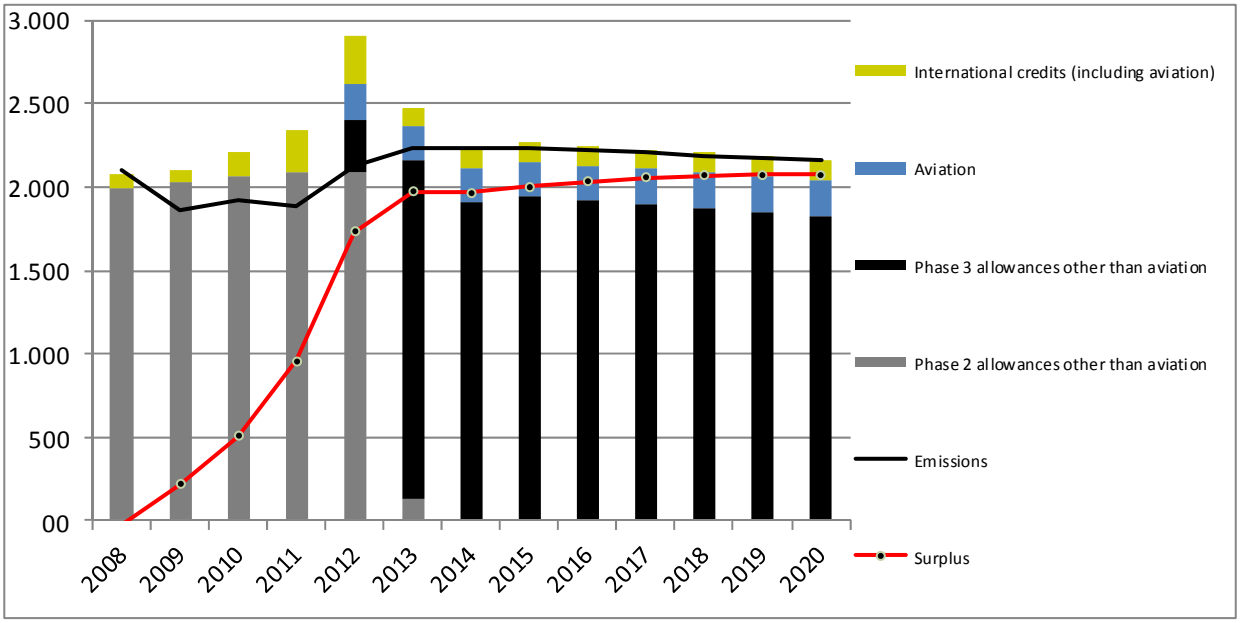
It is based on the assumptions that the timing of the auctioning of allowances would not change compared to the existing provisions foreseen in the Auctioning Regulation. As such it represents the baseline option for this impact assessment projecting a very rapid increase in the surplus up to 2013, not only due to emissions being below annual allocation but also because of above listed specific regulatory provisions related to the transition of phase 2 to phase 3 which increase the supply temporarily. From 2014 the yearly supply and demand would potentially be more in balance, resulting in a more gradual build-up to around 2 billion by 2020.

The specific assumptions for Figure 2 can be found in section 6.5 of that Staff Working Document. Also note that in the medium-term, by 2020, the eventual gradual development of the surplus, after the rapid build-up in the transition from phase 2 to phase 3, will depend on the future emission profile of the EU ETS[34].

[33] See section 4.3, Staff Working Document on the functioning of the carbon market.

[34] See also section 4.3 of the Staff Working Document on the functioning of the carbon market.

Figure 2: Example of a possible profile of annual issuance of allowances, use of international credits and surplus development



Source: Staff Working Document on the functioning of the carbon market

By the end of 2013 the surplus is likely to be well over 1.5 billion, potentially up to 2 billion. This rapid build-up occurs in a market already saturated and that is actually expected to experience a decrease in demand from hedging from 2013 onwards beyond the large amounts of auctioning that will be available from then onwards.

This may result in temporary downward pressures[35] and potential carbon prices not in line with mid to long term market fundamentals, as such also depressing auctioning revenue unduly.

Today's price signal in the EU ETS does not incentivise fuel switching from coal to gas, leaving many gas plants idle. A survey of 363 EU ETS operators in early 2012 by Thomson Reuters Point Carbon confirms that the price of European carbon allowances has become increasingly less important for investment decisions.[36] Furthermore prices that are too low, even if only temporarily, increase financing costs for low carbon investments as they increase the perceived risks associated with the low carbon investment.

All this points towards increased risk that even a temporary downward pressure and increased volatility in prices in the transition from phase 2 to phase 3 due to regulatory provisions may

35 This potential price drop is different in nature than the drop experienced at the end of phase 1, when banking of allowances into phase 2 was not foreseen, when there was no significant increase of issuance of allowances during the transition between phases and when there was no reason to see an increased use international credits for compliance.

36 Long term carbon prices remain for 38% of respondents the decisive factor and for a further 55% of respondents an influencing factor. However, for the first time since 2009, the share of those actually not taking carbon prices at all into account has almost doubled to reach 7% in the 2012 survey. Thomson Reuters Point Carbon, Carbon 2012, 21 March 2012, http://www.pointcarbon.com/news/1.1804940

actually have long term effects if it would lead to suboptimal investment decisions and carbon lock-in[37].

The aim of the options analysed in this proportionate impact assessment is not to address the structural surplus over phase 3. Addressing the overall level of the surplus would require structural measures that have additional implications beyond the mere transition from phase 2 into phase 3. Such measures require further analysis and discussion. The Carbon Market Report[38] lists a number of potential structural measures and invites comments by stakeholders. All these structural measures would require a full co-decision procedure.

Furthermore except changing the Auctioning Regulation, there are no temporary solutions that would affect the rapid build-up surplus in 2012 and 2013. Changing the supply of freely allocated allowances or the amount of JI and CDM credits that can be used for compliance in 2013 can only be done through substantial amendments to the EU ETS. Furthermore changing the supply of free allocation would have additional impacts on those sectors exposed to global competition, given that it not only affects the price of allowances but also the amount they receive for free. Such substantial amendments to the directive itself will require more time to agree upon and implement, as such failing to alleviate the specific concerns related to the rapid build-up of the surplus in the transition from phase 2 to 3.

The options considered in this impact assessment are thus a change in the timing of the auctioning of allowances within phase 3 without changing the total amount of auctioning allowances over phase 3, through amending the timeline of auctioning foreseen in the Auctioning Regulation.

This is a measure that needs to be approved through Comitology and as such can deliver a decision in a short period of time that gives more certainty to the market that supply and demand will be more balanced in the transition into phase 3 up to 2020. Such a change in auctioning time profile can allow for a more gradual absorption of surplus and thus a more stable and reliable price signal, which would not deteriorate the low carbon investment climate unnecessarily.

2.1. General objective

The general objective of the EU is to achieve the EU climate objective of limiting global average temperature increase to not more than 2 degrees Celsius above pre-industrial level. The EU ETS, as the main policy instrument at the EU level to reduce GHG emissions, needs to contribute to emissions reductions in a cost-effective and economically efficient manner.

2.2. Specific objectives

The specific objective is to ensure the orderly functioning of the European carbon market, in turn ensuring that short term exceptional developments do not unduly affect the ability of the EU ETS to deliver cost-effective outcomes, including over the longer term.

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[37] Carbon lock-in refers to investments that have long lifetimes and do not take sufficiently into account the need to further decarbonise our economy in the longer term. As such they increase total costs to achieve a low carbon economy given that they need to be compensated by more low carbon investments in the future or in the worst case need to be taken out of operation before the normal lifetime of the investment itself.

[38] COM(2012) 652

2.3. Operational objective

Adapt the EU ETS auction timetable to counter-act the rapid short-term increase of supply of allowances due merely to regulatory features associated with the transition of phase 2 into phase 3, leading to a more stable supply and demand balance and thus price development over phase 3.

3. OPTIONS

The auction time profile was one of the issues on which stakeholders were consulted when preparing the Auctioning Regulation[39]. In line with the received responses, the Auctioning Regulation provides for annual auction volumes calculated as the difference between the EU ETS cap and the amount of allowances handed out for free each year.

A deviation to this initial approach has already been adopted and concerns "early auctions", i.e. auctions of phase 3 allowances prior to the start of the multi-year trading phase. This volume was decided in an amendment to the Regulation that was agreed with Member States in July 2011[40] and underwent scrutiny by the European Parliament. The assessment of the time profile of phase 3 auctions was based on the assumption of an on-going economic recovery at the time, with growth projections still near 2% annually for both 2011 and 2012.

Table 1: Short-term GDP growth forecasts 2011-2012

	GDP growth projections for the EU as a whole	
DG ECFIN Economic forecasts	2011	2012
European economic forecast – spring 2011[41]	1.8%	1.9%
European economic forecast - autumn 2011[42]	1.6%	0.6%
European economic forecast – spring 2012[43]	1.5%	0.0%

Instead, a renewed phase of economic slowdown, with expectations of stagnation for 2012, and the resulting lower demand for allowances have reversed the market sentiment for the short-term, with expectations of supply continuing to outstrip demand. Other counterbalancing elements have also materialised. Most notably the doubling in 2011 of the use of international credits for compliance purposes to 252 million units, a number that may further grow in the transition of phase 2 to phase 3. Furthermore, the prospect of even lower prices in the future may have triggered increased selling of allowances by industry on the secondary market.

In order to address the particularly large imbalances in the transition to phase 3, this proportionate impact assessment evaluates alternative time profiles that back-load a part of allowances to be auctioned early in phase 3 towards the end of phase 3.

Table 2 below represents 6 options for such a change in the auction time profile compared to the current time profile with no changes applied to the current foreseen auctioning timeline

39 http://ec.europa.eu/clima/consultations/0002/index_en.htm

40 Commission Regulation EU (No) 1210/2011

41 http://ec.europa.eu/economy_finance/publications/european_economy/2011/pdf/ec-forecast-spring2011.pdf

42 http://ec.europa.eu/economy_finance/publications/european_economy/2011/pdf/ee-2011-6_en.pdf

43 http://ec.europa.eu/economy_finance/publications/european_economy/2012/pdf/ee-2012-1_en.pdf

(option 0 or the 'baseline' option for this impact assessment). There are three different quantities of backloading assessed, i.e. 400, 900 and 1200 million.

For each quantity 2 different options regarding timing are assessed. One sees allowances return in a period of 3 years, i.e. from 2018 up to 2020, the other sees allowances return only in the last year of phase 3, i.e. 2020.

All options would see the auctioned volumes reduce over the first three years of phase 3. They would also all reduce the annual auctioned volumes more in the earlier years, i.e. more in 2013 than in 2014 and 2015. This takes account of the fact that the supply-demand imbalance is expected to peak in 2013.

For more information about the total estimate for auctioning, see the Staff Working Document on the functioning of the carbon market.

Table 2: Options for back-loading (all figures in million allowances)

		2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2013-2020**
No change	Option 0	0	0	0	0	0	0	0	0	0
Large Change	Option 1	-550	-400	-250	0	0	400	400	400	0
	Option 2	-550	-400	-250	0	0	0	0	1.200	0
Medium Change	Option 3	-400	-300	-200	0	0	300	300	300	0
	Option 4	-400	-300	-200	0	0	0	0	900	0
Small Change	Option 5	-200	-150	-50	0	0	133	133	134	0
	Option 6	-200	-150	-50	0	0	0	0	400	0
Resulting time profile		**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2013-2020**
No change	Option 0	1056	1044	1092	1080	1067	1055	1043	1031	8468
Large Change	Option 1	506	644	842	1080	1067	1455	1443	1431	8468
	Option 2	506	644	842	1080	1067	1055	1043	2231	8468
Medium Change	Option 3	656	744	892	1080	1067	1355	1343	1331	8468
	Option 4	656	744	892	1080	1067	1055	1043	1931	8468
Small Change	Option 5	856	894	1042	1080	1067	1188	1176	1165	8468
	Option 6	856	894	1042	1080	1067	1055	1043	1431	8468

4. ANALYSING THE IMPACT OF DIFFERENT OPTIONS

4.1. Market balance and potential impacts on price development

A key question related to backloading is the impact on the price pattern over phase 3. In a perfect market – as defined in economic theory - if all market participants would act rationally and take into account the longer term perfectly without any information constraints and uncertainties, backloading would have a limited impact on the price pattern. In such a case, market actors would recognise that backloading would only decrease the surplus temporarily. For this reason surplus holders would react on any price rise due to backloading by selling part of their surplus, knowing they can buy again at lower prices later on in phase 3, when backloaded allowances are returned to the market.

In practice such an outcome is unlikely in the carbon market, as in any other real world market, even though the market is forward looking to the extent possible. But a market with a more limited time horizon will experience upward price pressures when supply decreases

temporarily and downward pressures when supply increases again temporarily. In such situations price reactions are sometimes stronger than merited by fundamentals.

Assessing the magnitude of these price impacts of backloading over phase 3 cannot be made with certainty for a number of reasons.

If backloading reduces supply to such an extent that those entities that are short (such as the power sector that does not receive free allocation) cannot acquire sufficient amounts of allowances from auctioning itself, then prices will be driven in part by the willingness to sell of existing surplus holders into the secondary market. Considering the sheer magnitude of the surplus largely held by industry, these entities strategy towards selling or not early in phase 3 will have important implications regarding the price developments.

Prices will thus be driven by the extent surplus holders require a price premium in order to sell today to accommodate for any perceived increased risks later on. Also surplus holders that entered the market for speculative reasons will require some premium before selling back into the market. Similarly, later on in phase 3, when increased auctioning would increase supply, the market will require lower prices than without backloading to absorb the increased supply, again to accommodate any uncertainties related to scarcity and price developments into phase 4.

It is not possible with certainty to determine at present the premiums required.

Prices will furthermore be influenced by the relative drop in demand from hedging. As explained in the Staff Working Document on the functioning of the carbon market, hedging demand has always existed but materialised as additional real market demand only late in phase 2 due to the upcoming shift to auctioning in the transition from phase 2 to phase 3. This demand continues to exist but will now likely be met through auctioning from 2013 onwards, resulting in less capacity of the market to absorb any surpluses[44]. The problem is that it is not possible to estimate with certainty how much of the build-up of the existing surplus was absorbed by this hedging demand and thus what its impacts was and will be on price formation.

A further uncertainty relates to the extent that the market may already have priced in backloading, as suggested by some private sector market analysts. Certain expectations about backloading might have shored up prices temporarily.

For these reasons, it is analytically difficult to assess the exact counterfactual scenario and impacts of alternative time profiles on the carbon price signal over phase 2 and 3. Modelling tools typically used by the Commission to assess the impact of certain targets, be it GHG target or specific energy targets, are better skilled at assessing mid to longer term evolutions and scarcities on the market, and are less well equipped to look at interaction of the above listed drivers and uncertainties within short periods of time.

Actually market analysts that have developed tools to look at short term price evolutions probably need to make also expert judgements on how these uncertainties impact short term price evolutions.

Taking into account the above, this assessment focuses on 3 elements:

[44] See section 3,4.2 and box 1 Staff Working Document on the functioning of the carbon market.

- existing assessments by the Commission;
- qualitative analysis on the basis of the profiles as presented in Figure 2, using the same assumptions as those presented in the Staff Working Document on the functioning of the carbon market;
- and a review of recent carbon price forecasts by a number of private sector market analysts.

4.1.1. Existing assessments by the Commission

The current prices for allowances are below any prices in line with the 2010 assessment by the Commission[45] of 2020 price levels, which projected 2020 prices in the range of € 16.5 to 25 (2008 prices) by 2020[46]. That same 2010 assessment also projected prices in case 1.4 billion allowances would be permanently withdrawn out of the ETS over phase 3, and concluded it would increase prices to € 30 (2008 prices) by 2020.

It can be assumed that any back-loading would not increase the carbon price beyond the levels modelled for such a permanent withdrawal, which would change the total quantity of allowances. Therefore, the 2010 assessment of impacts of such a permanent withdrawal remains valid also as an upper limit of the impacts of back-loading.

Since the 2010 assessment circumstances have changed again, with a renewed economic slowdown and new agreed measures under the Energy Efficiency Directive that can be expected to further reduce prices.

4.1.2. Qualitative analysis

For the qualitative assessment the same profiles are used as the ones presented in the Staff Working Document on the functioning of the carbon market (see also Figure 2 in this impact assessment or section 6.5 of that Staff Working Document).

It should be noted that uncertainties exist regarding the assumptions used to construct these profiles.

For instance emission profiles are prone to variations, with certainly in the mid to longer term a higher likelihood of deviations in the emission profile. See for instance differences in emission levels in figure 4 in the Staff Working Document on the functioning of the carbon market, which represents the evolution of the surplus in the so called baseline and reference scenarios resulting in respectively lower and higher total surpluses by 2020 compared to the profile used for this proportionate impact assessment.

Also the exact timing of when international credits are used for compliance is uncertain. On the one hand an increasing number of operators will exhaust their entitlement to use international credits for compliance, on the other hand it is likely that a relatively high amount of credits will be used in 2012 due to the fact that certain types of credits will not be recognised anymore from 2013 onwards. Furthermore a large part of the remaining future

[45] Staff Working Document accompanying the Communication 'Analysis of options to move beyond 20% greenhouse gas emission reductions and assessing the risk of carbon leakage - Background information and analysis - Part II (SEC(2010) 650)

[46] See also section 4.3 of the Staff Working Document on the functioning of the carbon market.

inflow of CDM in the ETS might already be contractually arranged. The widening spread (i.e. the price difference) between allowance and CER prices indicates a tendency towards such saturation of demand for CERs[47].

The qualitative analysis focuses on how changes in the auction time profiles impact on the potential annual deficit or surplus and how it influences the speed of the build-up of the surplus. Figure 3 below represents these two elements graphically for option 0, using the same profiles as in Figure 2. This graphical representation of the different options facilitates the qualitative analysis. But one should take into account the uncertainties as listed above, and as such they are stylised scenarios where the focus of the qualitative analysis should be on the relative differences between the scenarios.

Figure 3: Option 0, no backloading

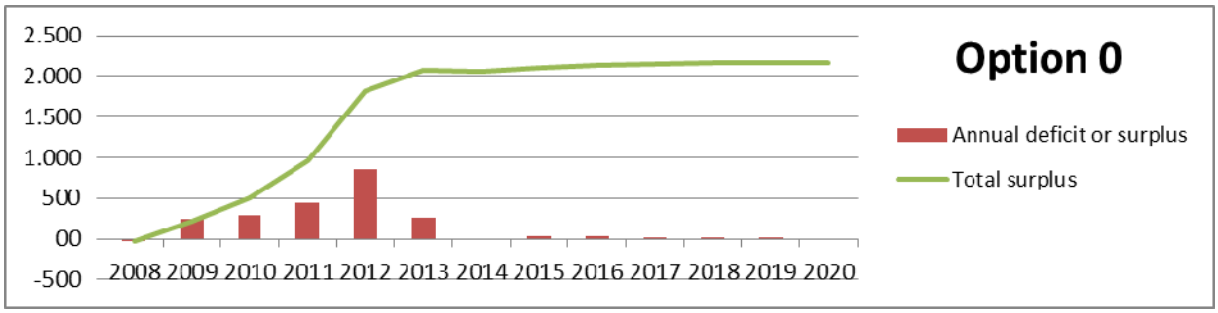


Figure 4 gives a graphical overview of the impact of backloading 1200 million allowances in the first 3 years of phase 3 and returning them in 3 years and 1 year at the end of phase 3 (options 1 and 2).

These options would result in the following impacts:

First part of phase 3:

- A significant reduction in the market imbalance in the years 2013, 2014 and 2015. Nevertheless, the annual reduction in the surplus remains below the increase experienced in 2011 and expected over 2012. By 2015, the surplus would be below 1 billion allowances instead of around 2 billion under option 0.

- The decrease in the auctioned volumes early in phase 3 would require drawing on existing surpluses, on average annually 300 million from 2013 to 2015, to make available to the market the allowances needed to cover the emissions. This will certainly support upward price development over the period of time up to 2015.

- With this level of backloading, the combined surplus in 2012 and 2013 still runs at over half a billion (it would be over a billion without this backloading). So even taking into account backloading, short-term price increases may be moderate, but could become more pronounced over the period.

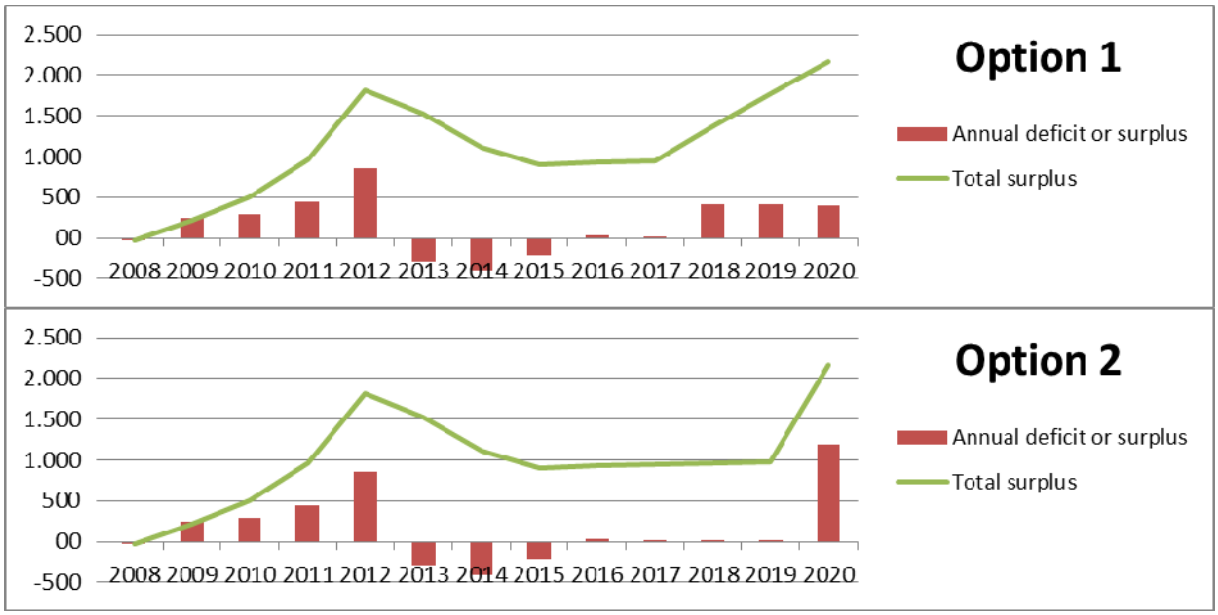
Second part of phase 3:

[47] Early September 2012 the difference in prices was € 5.78. Prices for CERs (CDM credits) and EU ETS allowances, respectively, were € 2.12 and € 7.90. Source: Carbon Market Daily 10 September 2012. Prices are for futures contracts with delivery in December 2012.

- In both options, once backloading results in increased auctioning later in phase 3, annual surpluses reappear immediately. For option 1 this results in an average annual surplus in the last 3 years of around 400 million annually (similar to the annual average build up in phase 2). For option 2 it results in a surplus in 2020 of around 1200 million.

- Price impacts are expected thus to be clearly downwards. Option 1 would require smaller annual absorptions of renewed surpluses but would do so for a three year period thus negative price impacts can build up. Option 2 on the other hand would be a one off correction which will certainly strain the capacity to absorb but will depend also on expectations about the market balance over phase 4 (2021 to 2028). It is not possible to estimate with certainty what the eventual outcome is by 2020 of the three options, even though option 1 is expected to produce a steadier price pattern.

Figure 4: Options 1 and 2, backloading with 1200 million allowances



Summary: This magnitude of back-loading is likely to provide strong temporary support to the price signal in 2013-2015, but also downward pressure by 2020 compared to option 0. Under all options, the downward pressure can be relatively lower in 2020 depending on expectations of market balance over phase 4. These options do not seem to be able to ensure sufficient stability in the market. If not followed by structural measures addressing the surplus in a sustainable manner, the effect might simply be to have first upward prices followed by downward prices later on.

Options with a higher amount of backloading were not considered given that they would only exacerbate these impacts and can only be considered meaningfully in connection with structural measures.

Figure 5 gives a graphical overview of the impact of backloading 900 million allowances in the first 3 years of phase 3 and returning them in 3 years and 1 year at the end of phase 3 (options 3 and 4).

First part of phase 3:

- A relatively limited deficit would appear in 2013. The average annual deficits and thus reductions in surplus in the years 2013-2015, at around 200 million remain below any increase experienced in the years in phase 2 bar 2008. In 2015, the surplus would still be above 1 billion allowances and will actually have grown with 200 million compared to where it was at the end of 2011.

- Some amount of backloading is probably already incorporated in price setting, without it prices would even be lower today. Taking into account that combined over 2012 and 2013 the surplus would still increase by around 700 million allowances, and the drop in hedging demand beyond auctioning in 2013, price effects might be not that large in 2013.

- On an average annual basis over the period 2013-2015 it only requires limited levels of drawing on existing surpluses, i.e. 200 million, to make available to the market the allowances needed for compliance. Price support therefore is considerably lower than options 1 and 2 but the eventual magnitude will depend on the premium surplus holders require to bring their surplus to market.

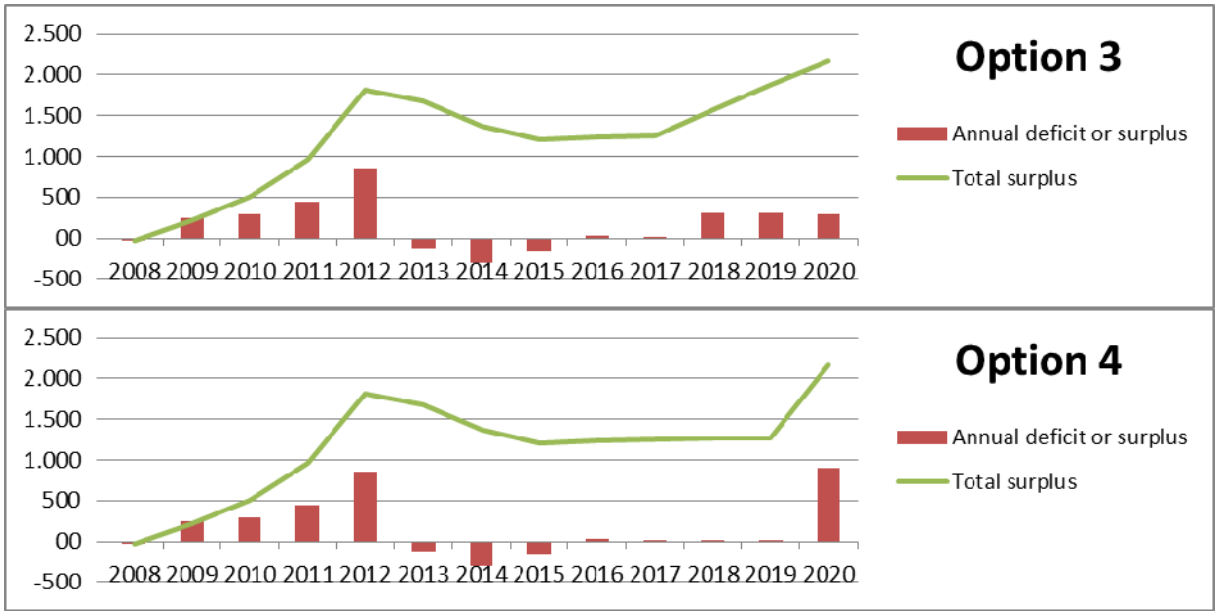
Second part of phase 3

- In both options, once backloading results in increased auctioning later in phase 3, annual surpluses reappear immediately. For option 3, this results in an average annual surplus in the last 3 years of around 300 million annually (similar to the annual average build up in phase 2). For option 4 it results in a surplus in 2020 of around 900 million.

- Price impacts are expected thus to be downwards but clearly less than for options 1 and 2. Certainly option 3 would require absorption rates not much different than those experienced in 2009 and 2010. In a context that expectations towards the end of phase 3 might be more focused on phase 4 being short, this might well lead to moderate negative price impacts over the second half of phase 3.

- It is not possible to estimate with certainty the eventual outcome by 2020 of both options, but relative differences between the price paths in the second part of phase 3 are likely less pronounced than for options 1 and 2, even though option 3 probably still will have a steadier price pattern than option 4.

Figure 5: Options 3 and 4, backloading with 900 million allowances



Summary: This magnitude of back-loading is likely to provide for temporary support to the price signal in 2013-2015 compared to prices at present, but also to more limited downward pressure by 2020 compared to options 1 and 2. All these options seem to be able to bring a more sustained stability in the market than options 1 and 2 do. As such prices might be more likely in line with mid to long term market fundamentals, taking into account the expected overall surplus by 2020. Option 4 still has a less steady price pattern than option 3, probably depressing the price later on in phase 3.

Figure 6 gives a graphical overview of the impact of backloading 400 million allowances in the first 3 years of phase 3 and returning them in 3 years and 1 year at the end of phase 3 (options 5 and 6).

First part of phase 3:

- A very limited deficit would appear in 2013. The average annual deficit the years 2013-2015, at around 100 million remains well below any increases experienced in the years in phase 2 bar 2008. In 2015, the surplus would still be above 1.5 billion allowances and thus would have grown with around 750 million in comparison with the end of 2011.

- Given that some amount of backloading is probably already incorporated in price setting, given that in 2013 the surplus would continue to grow and combined with 2012 would actually grow with almost a billion, and given that net hedging demand beyond auctioning is expected to the drop in 2013, there is no certainty that prices will be supported.

- Over the period 2012 - 2015 the combined surplus would still end up increasing with around 750 million allowances compared to 2011. On an annual basis only 2014 would result in any substantial reduction of the surplus. Price support over the start of phase 3 is therefore limited.

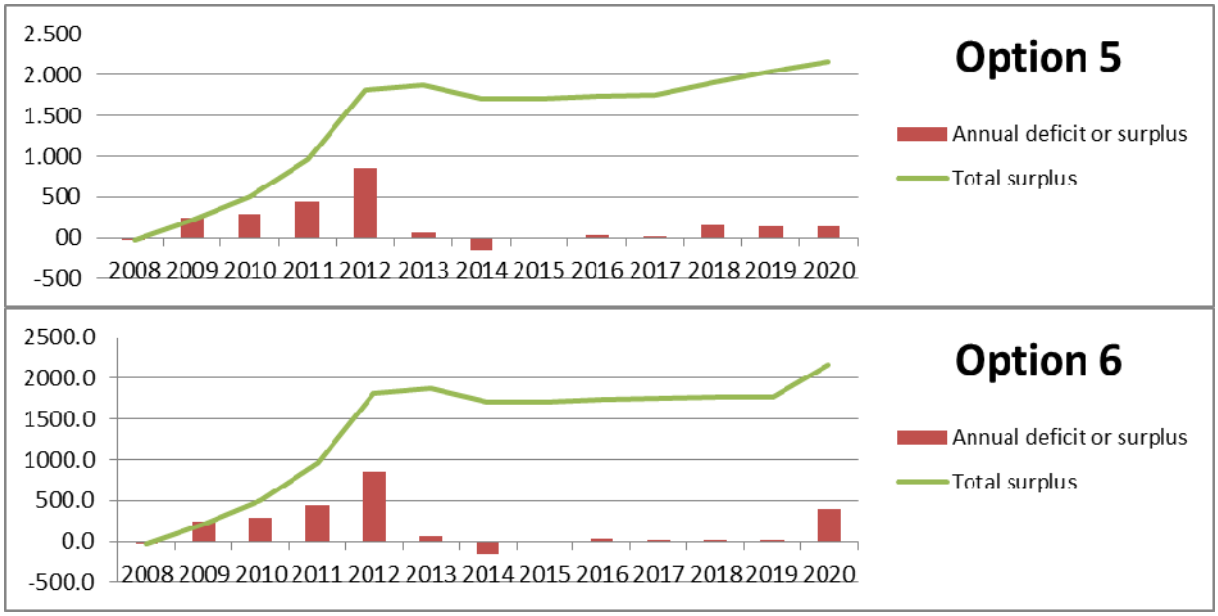
Second part of phase 3:

- In both options, once backloading results in increased auctioning later in phase 3, annual surpluses reappear but remain very limited. For option 5 the surpluses become around 100 million while for option 6 it is around 400 million in 2020.

- Price impacts are expected thus to be very limited but downwards but clearly less than for any of the previous options.

- It is not possible to estimate with certainty what the eventual outcome is by 2020 of the two options, but relative differences between the price paths in the second part of phase 3 are probably limited.

Figure 6: Options 5 and 6, backloading with 400 million allowances



Summary: This magnitude of back-loading is likely to provide for only very limited temporary support to the price signal in 2013-2015. The continued increase in the surplus in 2013 together with hedging demand beyond auctioning expected to drop in 2013, may actually result at first in a price decrease in 2013 compared to current prices. Negative price impacts late in phase 3 are expected to be very limited compared to option 0. None of these options seem to be able to bring sufficient stability of the issuance of allowances and scarcity in the market, in particular in 2013, when the market imbalance is expected to peak.

4.1.3. Review of recent carbon price forecasts by a number of private sector market analysts

The annex in section 6.1 compiles recent forecasts by market analysts. Not all of them provide forecasts for all the back-loading options assessed in this proportionate impact assessment, and not for all years of phase 3, which makes a direct comparison of the options difficult. Also other options by the analysts than those assessed in this proportionate impact assessment are included in the tables in section 6.1 to give an overview of the expected ranges of price impacts. These forecasts may be based on somewhat different timetables as regards the reintroduction of the back-loaded volumes.

Table 3 below gives an overview of projections that assume no backloading. Analysts seem to agree that the current auction time profile will result in a sustained weak price signal for the

early part of the period, with average price projections for 2013 without backloading to be around €5 in 2013 and around €5.4 over the period 2013-2015. This confirms that no action will lead to further weakening of the price signal.

By 2020 the projected price differentiation is more pronounced between analysts, with a range of € 10 to € 29.

It should be noted that analysts typically project nominal price expectation, whereas model projections as those used in existing assessments by the Commission (see section 4.1.1) use real prices. This needs to be taken into account when comparing prices. A nominal price projection of € 10 in 2020 is equal to a price projection of around € 8 if expressed in 2008 real prices[48]. Similarly a nominal price projections of € 29 in 2020, is equal to a price projection of around € 23 if expressed in 2008 real prices. This compares for instance with price projections for 2020 in the 2010 assessment by the Commission[49] in a range of € 16.5 to 25 (2008 prices) by 2020.

While all short term forecasts show low prices, there is a larger divergence for 2020 forecasts. The extent to which analysts take into account market fundamentals beyond phase 3 varies and might explain diverging price projections in the mid to longer term[50].

Table 3: Overview of carbon price projections by market analysts with no backloading

Amount backloaded	Min price 2013-2015	Max price 2013-2015	2020	Sources*
	(all prices are nominal, €)			
Option 0				
0 Mt	4.5	5.5	10	Barclays
0 Mt	4	5	12	Thomson Reuters Point Carbon
0 Mt	4.5	8		Tschach Solutions**
0 Mt	6.2	6.7	29.2	Bloomberg New Energy Finance
*Sources: see section 6.1 for more information ** Tschach Solutions only projects price impacts up to 2014 prices, first two quarters.				

Table 4 lists a summary of the results of the impact of backloading on the price in the period 2013 to 2015, when the price is expected to increase due to backloading.

The compilation and presentation of these forecasts does in no way imply a formal endorsement of the presented forecasts.

Regarding the impact of backloading, the projections differ. For all the backloading options, with shifts from 400 to 1200 million allowances, most analysts see limited increases in 2013 with the price between €6 to €13.

Most seem to agree that with backloading the price continues to increase in the period 2013-2015, resulting in highest price estimates for 2014 or 2015.

48 Assuming a 2% annual inflation rate over the period 2008 – 2012.

49 Staff Working Document accompanying the Communication 'Analysis of options to move beyond 20% greenhouse gas emission reductions and assessing the risk of carbon leakage - Background information and analysis - Part II (SEC(2010) 650)

50 See also section 4.3 of the Staff Working Document on the functioning of the carbon market.

Table 4: Overview of projections of impacts backloading by market analysts

Amount backloaded	Min price 2013-2015	Max price 2013-2015	Sources*
	(all prices are nominal, €)		
Backloading options similar to options 1 to 6			
400 Mt	5.5	6	Barclays
	6	8	Thomson Reuters Point Carbon
	7.3	11	Bloomberg New Energy Finance
500 Mt	9.75	19	Tschach Solutions**
700 Mt	7.5	11	Barclays
800 Mt	9	11	Unicredit
900 Mt	10	12	Thomson Reuters Point Carbon
	8.6	20	Bloomberg New Energy Finance
	13	23.5	Tschach Solutions**
1200 Mt	9	20	Barclays
	13	14	Thomson Reuters Point Carbon

*Sources: see section 6.1 for more information
** Tschach Solutions only projects price impacts up to 2014 prices, first two quarters.

For 2020 there are limited projections on prices that include the impact of backloading options (see section 6.1). One analyst sees prices stay constant in 2020 with backloading compared to option 0 and another sees prices decrease[51]. Again, it is not clear how these analysts take into account longer term fundamentals beyond phase 3, which is an important element in long term price forecasts. As such it is difficult to draw a conclusion on analysts' expectations in relation to prices in 2020.

4.2. Auctioning Revenue

One of the recommendations of the European Semester[52] points out that pursuing structural reforms, such as shifting taxation away from labour, will enable Member States to get ready for longer term challenges. According to a recent report by the International Monetary Fund, carbon pricing has the potential to become a large new source of government revenue, which could considerably contribute to meeting fiscal consolidation challenges and, more generally, to building more efficient and fairer national revenue and spending systems[53]. On the other hand, according to certain industry stakeholders, for example the German Industry Association (BDI), in a coordinated energy and climate policy, the aim of the EU ETS should be the cost-efficient achievement of agreed targets only, and it should be no instrument to increase government revenue.[54]

Under option 0, government revenue from auctioning that could be used for such purposes, including climate finance, renewables, the transition to low-carbon business models and state aid for indirect impacts through electricity prices, could remain substantially depressed for many years. Options 1 to 6 would reduce the number of allowances that would be auctioned

[51] Thomson Reuters Point Carbon, Cancellation is the magic word, 27 August 2012. They conclude that price estimates with back-loading do not result in significant changes in the average phase 3 prices compared to a situation with no backloading.

[52] COM(2012) 299 final

[53] IMF, Fiscal Policy to Mitigate Climate Change, 2012

[54] E.g. Bundesverband der Deutschen Industrie, contribution to the online consultation.

in the period 2013-2015. Obviously, the larger the change in the auction timetable, the smaller the amount of allowances to be auctioned in that period. However, back-loading is not expected to lead to reduced revenue in the early years. On the contrary, it is likely to result in an increase due to an increase in the carbon price. The larger the decrease in the auction volume, the higher is the expected temporary price increase in 2013-2015.

Table 3 below shows by how much prices would need to increase compared to the average price forecast by analysis for 2013-2015 in order to ensure that it is budget neutral in that period. According to the analysts' assessments the 2013-2015 period (see also Table 3), the corresponding price increases would go on average beyond these minimum levels compared to their price projections for a situation with the current auction timetable without backloading (option 0).

Table 5: Price levels that would result in budget neutrality regarding auction revenue in 2013-2015 for the different options

	Backloading	Resulting average price in 2013 - 2015 (€, nominal)
Option 0	0 mio	5*
Options 5 and 6	400 mio	5.7
Options 3 and 4	900 mio	7.0
Options 1 and 2	1200 mio	8.0

*For illustrative purposes, the assumed base case price is based on average of forecasts for 2013-2015 prices for option 0 as given in 6.1.

4.3. Impact of carbon prices on investment decisions

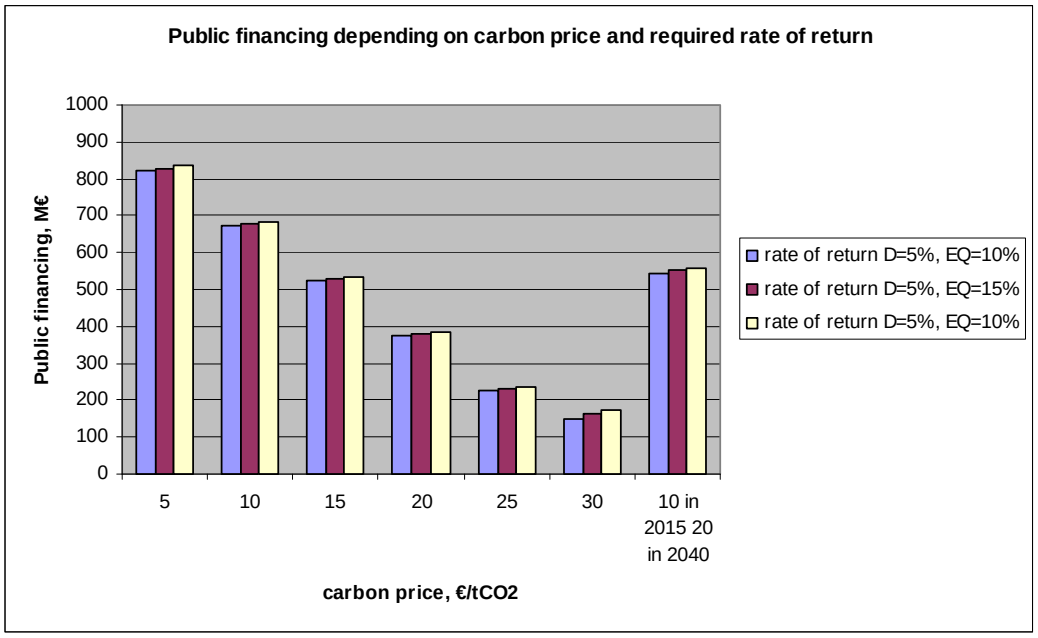
A continued unrepresentatively weak carbon price signal for the early part of the period can negatively affect low carbon investments, paradoxically increasing the need for public support in the short run for instance to meet the 20% renewables target, at times when many support schemes actually are under strain from limited budget resources. Similar concerns can be raised in respect to the development and deployment of a number of low carbon technologies. But certain stakeholders have raised concern that backloading hampers the predictability and increases regulatory risk of further intervention that rather deters investments[55].

It is not possible to quantitatively estimate the extent to which backloading could increase the perceived risk for investors and thus negatively impact investments. What is possible it to estimate of the impact of different carbon price expectations on potential investment decisions. The below figure represents the results of a stylised example that assesses how higher or lower carbon prices price can influence the required additional funding to make a new coal-fired plant investment with carbon capture and storage (CCS) as profitable as one without the CCS[56].

55 E.g. . Eurometaux, contribution to the online consultation.

56 For stylized assumptions applied, see: Commission Staff Working Document accompanying the Communication Demonstrating Carbon Capture and Geological Storage (CCS) in emerging developing countries: financing the EU-China Near Zero Emissions Coal Plant project.

Figure 7: Upfront subsidies required to install CCS in a new build pulverised coal plant



(D=debt taken on to finance the project; EQ=equity part financing the project)

Source: Commission Staff Working Document accompanying the Communication Demonstrating Carbon Capture and Geological Storage (CCS) in emerging developing countries: financing the EU-China Near Zero Emissions Coal Plant project

What is clear is that, at limited increases, the expected carbon price signal can make significant differences in the profitability of certain types of low carbon investments, certainly those with long lifetimes.

If the present situation in the EU ETS with its rapidly increasing imbalances translates into a reduction in perceived future prices it can clearly lead to underinvestment in low carbon generation capacity and actually risks increasing carbon prices later on. Furthermore, increased uncertainty at present in the power sector actually increases the risk of underinvestment, not only in low carbon technologies, negatively affecting security of supply.

In this context it should be noted that a stronger carbon price signal not only benefits low carbon investments with long lifetimes, it also increases the value of allowances auctioned in the short term. Of the 300 million allowances from the EU-wide new entrants reserve for phase 3 that are available to stimulate the construction and operation of large-scale demonstration CCS projects as well as innovative renewable energy technologies (NER300 programme), 200 million allowances will already be monetised in 2012. However, a further 100 million allowances are to be monetised by the end of 2013. This means that every €1 increase (or avoided drop) in the carbon price in 2013 will lead to a €100 million increase in revenue available for these type of projects. Options 1 and 2 are expected to lead to the highest benefit in this respect.

The above only underlines the crucial importance of carbon price expectations to drive low carbon investments and avoid unnecessary carbon lock-in. If market participants that need to make investment decisions expect prices in the coming years to remain low, if the revenue from the NER300 programme remains much lower than expected, a lot of low carbon

investment, including certain renewables investment, will not come to the market, or require considerable support mechanisms by governments when at the same time the government revenue from auctioning will also be substantially lower than initially expected.

4.4. Relationship with national climate policies in Member States

The EU ETS is designed to promote a cost-effective reduction of GHG emissions across the EU by means of a single carbon price signal and harmonised rules. The carbon price signal it generates plays a key parameter for investment and operational decisions of companies across the EU.

If the carbon price in practice is at a level where it is widely considered too low to make a significant difference, Member States are more likely to seek to adopt national climate or energy policies directly effecting investment and operational decisions within their national jurisdiction. Certain stakeholders already expressed concern that it has encouraged some Member States to fall back on developing national and even sub-national policies at the expense of transparency that the EU ETS provides[57]. This is not necessarily cost effective from a Community or a climate perspective, and in the worst case risks undermining the functioning of the EU ETS and more widely distort competition in the internal market, notably the internal energy market. Politically, the risk of fragmentation of national policies overlapping with the ETS is clearly related to the level of the carbon price.

Under option 0, the EU runs a greater risk of such fragmentation, as a weak EU ETS does not pull its full weight – and this at a time where, as regards the climate action and energy, most stakeholders agree on the need for a more coherent and European level approach (see section 1.5). The risk of such fragmentation is expected to be more modest in case of for instance backloading options 3 and 4 which are likely to bring a longer stability (see qualitative analysis in section 4.1.2).

However, without a cancellation of at least part of the back-loaded volume, no option can guarantee a stronger and stable price signal throughout phase 3 which is requested by some stakeholders (see section 1.5).

4.5. EU competitiveness considerations

The EU ETS and the EU climate policy in general have a twofold impact on the EU competitiveness. On the one hand, through the transition towards a low-carbon economy, Europe has the opportunity to become more competitive by modernising its economy, developing new sources of sustainable growth and jobs and becoming much more energy secure. On the other hand, addressing climate change through constraints such as the carbon price may represent additional cost in the production of energy-intensive goods for which no complete pass through of such additional costs is possible.

Reducing the risk of carbon leakage is an important consideration in EU climate policy. There are, of course, numerous reasons for competitive advantages and disadvantages in energy-intensive industries other than the costs of carbon, but the lower the carbon price and the more countries with competing businesses sign up to comparable levels of effort to cut emissions, the less the risk of carbon leakage.

[57] E.g. International Emissions Trading Association, contribution to the online consultation.

The impacts of back-loading are expected to remain within the carbon price levels projected by past analysis. According to the 2010 Communication[58], that took into account the impact of the crisis, the impact of the EU's current reduction target, would be typically less than a 1% production loss by 2020 and be smaller if other countries indeed implement their low-end Copenhagen Accord pledges[59].

Nevertheless, given the uncertainties related to the actual implementation of the Accord, the Commission considered that the measures already agreed to help the energy-intensive industries – free allocation and use of international credits – remained justified. The analysis also showed that the incremental impact of a permanent set-aside (to step up the EU effort to 30%) in comparison to the current package of policies on the output of the EU's energy intensive industry would be limited, as long as special measures already taken for energy-intensive industry stay in place.

The options considered in this proportionate impact assessment would affect the timing of the auctions, not the free allocation or total quantity of allowances over the period (the cap). Thus the quantity of free allocation that energy-intensive sectors deemed to be exposed to global competition will receive, will be unaffected in any given year in phase 3 under all back-loading options.

Therefore, back-loading impacts the distribution of the effects over time, potentially increasing costs early on but at the same time potentially decreasing them later on for those companies that need to acquire allowances on the market.

Given the continued free allocation to industries deemed to be exposed to global competition in phase 3 and the existing large surplus of freely allocated allowances in phase 2 for these sectors as a whole, some will certainly be net sellers into the EU ETS over phase 3. For these companies backloading would actually result in the opposite effect, with revenues of potential net sales increasing early on, and decreasing later on.

General equilibrium modelling tools such as GEM-E3 or PACE are typically used to assess competitiveness impacts because they allow to model interactions between sectors and across country borders. They model the optimal equilibrium outcome in a given point of time, making them as such not an ideal tool to look at short term variations. They do not optimise across time periods which also makes it more difficult to assess the impact of the large surplus that are available to industry stemming from allocation of allowances higher than emissions in phase 2, which will require optimisation over time (be it for own compliance of by selling them into the market).

Therefore in order to assess the overall impacts on competitiveness, a more static approach was used, focusing on the years 2013 to 2015, which is the period prices are expected to increase. Section 4.5.1 assesses the build-up of surpluses in the industrial sectors over phase 2. An assessment is made on what the net direct impacts from backloading may be on these sectors early on in phase 3. This section will also assess the direct impact related to the aviation sector. Section 4.5.2 will look at the potential indirect impact of increases in electricity prices on competitiveness.

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58 Communication 'Analysis of options to move beyond 20% greenhouse gas emission reductions and assessing the risk of carbon leakage (COM(2010) 265 final)

59 See for instance table 29, Staff Working Document accompanying the Communication 'Analysis of options to move beyond 20% greenhouse gas emission reductions and assessing the risk of carbon leakage - Background information and analysis - Part II (SEC(2010) 650)

4.5.1. Potential direct costs

In terms of the extent of the surpluses accumulating in phase 2, the verified emissions data show in aggregate a surplus of free allowances in relation to emissions from industrial sectors (excluding the power sector) reported in the first four years of the 2nd trading period (2008-2011) of almost 33% or around 697 million allowances[60]. It is expected that the surplus will continue to grow in 2012, the last year of phase 2. Assuming the same increase as in 2011, the industrial surplus for the entire phase 2 would amount to more than 788 million allowances.

For phase 3 the number of free allowances to be allocated will be based on Union-wide harmonised allocation rules.

Member States have at present submitted the National Implementation Measures (NIMs) that include the lists of installations that should receive free allocation and the respective amounts. The Commission is at present processing these lists and no final numbers of free allocation have been determined yet. But based on a first review of the submitted NIMs a working estimate for this impact assessment was defined as a range of potential total free allocation to the industrial sectors was made of 775 to 825 million for the period 2013 to 2015[61].

Most of these installations were already included in the EU ETS and thus reported emissions. For those that have not yet reported emissions in the EU ETS, estimates have been made based on other reporting obligations. Table 6 gives an overview of the overall estimates of potential emissions for industrial sectors that receive free allocation using reported historic emissions in 2005, 2008, 2009 and 2010 as a starting point for the extrapolation of emissions in the period 2013 - 2015. It also lists the range of potentially freely allocated allowances of 775 to 885 million allowances in 2013, 2014 and 2015 and the resulting deficits or surpluses over a year and over the period of 3 years.

Due to the impact of the crisis, emissions estimates for 2013-2015 based on 2009 historic data are lowest and 2005 are highest (industrial emissions in 2008 already decreased in the 2nd half of the year due to the starting crisis).

If emissions in 2013 to 2015 would be similar to those in 2009 then free allocation would continue to result in a surplus of 255 million allowances over the period 2013 to 2015. With 2010 emissions as a basis for the estimate for emissions in 2013-2015 emissions, the total surplus would still be in the range of 327 to 477 million allowances. If 2005 is used as a basis for extrapolating 2013-2015 emissions than in case of the lower range of free allocation a deficit is projected, equal to 84 million over the 3 year period.

The main reason why this situation may occur is that free allocation will be based on historic production data for the years 2005-2008 when production was relatively high However, it should also be noted that in 2013 to 2020 the rules on reduced allocation for closure and reduced production will be stricter than in the current phase, while the actual impact on allocation is difficult to assess at this stage.

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60 All installations reported in the European Union Transaction Log (EUTL) that do not have as sector code 'combustion installations'.

61 For these calculations, the "industrial sectors" are assumed to be equal to all installations that are not identified as "electricity generators". Therefore this does not include free allocation following the application of the derogation allowed under article 10c.

Furthermore free allocation includes also the allocation for cross boundary heat flows that do not correspond to emissions in the industrial sectors themselves but are a compensation for those sectors that produce waste gases that are used to as fuel for electricity installations downstream.

Table 6: Estimated amount of allowances that industrial sectors would need to purchase assuming different emission levels (million allowances)

Million allowances	**Annual amounts 2013 – 2015**							
Extrapolation based on historic emissions of year x	2005		2008		2009		2010	
Estimate total emissions	803	803	752	752	666	666	687	687
Estimate free allocation	775	825	775	825	775	825	775	825
Annual potential deficit (-) or surplus (+)	-28	22	23	73	109	159	88	138
	Total amounts 2013 – 2015							
Total potential deficit (-) or surplus (+) 2013 – 2015	-84	66	69	219	327	477	264	414

On the basis of the magnitude of phase 2 surplus and the working estimate for a range of phase 3 free allocations to industry, it can be expected that in aggregate the industrial sectors remain holder of a large surplus in the first years of phase 3 when backloading would increase carbon prices.

If production and emission of industrial sectors on average in the period 2013-2015 would reach levels similar to 2010 or 2011[62], the total accumulated surplus for industries could continue to grow to over a billion allowances. In this case industry as a whole could see benefits in the period 2013-2015 from back-loading in to form of an increased value of their still growing surplus. If emissions towards 2020 would increase well beyond the levels in 2010 or the free allocation by 2020 would decrease due to the possible application of a cross-sectoral correction factor, than any resulting deficit by the end of phase 3 could actually become cheaper to acquire because of backloading.

If production and emissions of industrial sectors on average in the period 2013-2015 could reach levels similar to 2005, the total accumulated surplus for these industries by the end of 2015 could still be within the range of 704 to 854 million allowances[63].

Assuming that free allocation would be at the low end of the range, they would need to acquire 84 million allowances over the period 2013 – 2015. If they would acquire allowances on the market to compensate the deficit (and not use any remaining surplus), and assuming a carbon price between € 10 and 15, costs would be between € 840 and 1260 million. On the other hand, every € 1 of increase in value would increase the value of the originally accumulated surplus for those sectors by € 704 to 854 million. Of course some of these surpluses have already been sold by industry. However it is not possible to estimate how much net outflow there was.

It has to be noted that these are estimates at aggregate level, with potentially variations between sectors and installations. Certainly not all individual operators had a surplus over phase 2 and also across sectors significant differences in surplus build up exist (see Table 7

[62] 2011verified emissions in the EU ETS other than combustion installations decreased by 1% compared to 2010.

[63] Based on the following assumptions: over phase 2 industry as a whole has a cumulative surplus of 788 million allowances, the deficit or surplus over the first 3 years of phase 3 of the estimates listed in Table 6.

below). Some stakeholders indicate that they expect their sector to have to buy allowances to cover their needs in phase 3[64].

Given the on-going scrutiny of the NIMs, it is too early to give with sufficient certainty the potential allocations per sector for phase 3. Given the harmonised approach at EU level, it is not certain if in case of continued surplus build up in phase 3 (see Table 6) the same sectors as presented in Table 7 would end up benefiting most or least from the continued build up.

Table 7: Surplus of allocation of free allowances compared to emissions in the period 2008-2011 per sector

Sector	Surplus compared to overall emissions	Absolute surplus (in million allowances)
Ceramic products	89%	36
Pig iron and steel including continuous casting*	69%	301
Metal ore roasting and sintering installations	60%	33
Pulp and paper	35%	41
Cement clinker and lime	32%	207
Glass including glass fibre	24%	20
Coke ovens	19%	14
Other activities opted-in pursuant to Article 24	9%	8
Mineral oil Refineries	6%	37

*Note: During phase 2, a share of free allowances for steel was allocated to the electricity producers for the use of waste gases.

Source: European Union Transaction Log (EUTL), verified emissions and allocation data according to EUTL main activity type for 2008-2011 corresponding to industrial sectors.

The industries deemed to be exposed to a significant risk of carbon leakage represent a very large part of total industry, given that most sectors other than the power sector were categorised as such[65]. A rough estimate puts the share of emissions and allowances of industrial sectors (other than the electricity sector) deemed exposed to a global competition, at more than 90% of the total industrial emissions and allowances. The above assessment can thus be seen as representative also for those sectors exposed to global competition.

The aviation industry is also a sector that is impacted by any price changes due to backloading. Certain aviation stakeholders have expressed concern that backloading is a price intervention that will evidently impact their costs[66]. While neither the amount of free allocation, i.e. 85% of the annual amount of aviation allowances issued nor the time profile of aviation allowance auctions would change for this sector as a result of backloading, the value of allowances would change. The sector is expected to be a significant net buyer in phase 3 of allowances, potentially estimated up to 700 million over the period 2013-2020 (see annex 6.2).

There should not be a significant competitiveness concern for European airlines compared to third country carriers, given that a central principle of the law is that all carriers are treated

64 E.g. Europia, contribution to the online consultation.

65 Article 10a of the EU ETS directive defines a number of criteria that determined if a sector or subsector should be categorised or not as "deemed to be exposed to a significant risk of carbon leakage".

66 E.g. International Air Carrier Association, contribution to the online consultation.

equally in the EU ETS. Changes in carbon prices might affect profitability of the sector depending on the extent that companies pass through to costumers the value of allowances.

Annex 6.2 gives an estimate of the potential amount of allowances and international credits the sector would acquire, following the emission assumptions used in section 6.5 of that Staff Working Document. Of course uncertainties remain regarding the actual emission levels for this sector, and some projections by analysts for instance indicate lower growth in emissions.

Based on the assumptions in Annex 6.2, airlines would acquire on average around 75 million allowances in the period 2013 – 2015[67]. Therefore every € 1 price increase in the period 2013 to 2015 would thus potentially increase annual prices for aviation services by around € 75 million on average[68].

In principle there would be no direct costs to airlines from backloading assuming they apply cost pass through, other than from potential changes in demand for their services due to the change in prices. Impacts will also be different if the sector includes the opportunity costs of free allowances in ticket prices. If so, a € 1 price increase in the period 2013 to 2015 would increase annual costs for customers by around € 240 million on average and increase net income for the aviation sector by around € 100 million on average. This is because the sector would acquire on average annually 75 million allowances in the period 2013-2015 but also receives for free a bit more than 170 million allowances annually.

4.5.2. Potential indirect cost

Cost relating to CO2 emissions passed on electricity prices (indirect cost) may affect the competitiveness of some electricity-intensive industries. According to certain stakeholders higher carbon prices result in higher power prices that damage the competitiveness of electricity-intensive industries.[69] The indirect cost is estimated according to a formula that takes into account the cost pass through factor and CO_2 emission factor for electricity supplied by combustion plants in a geographic area. With top end assumptions, i.e. full cost pass through, and an average CO_2 emissions factor from power production in the EU in 2007 of 0.465 tCO2/MWh[70], a 1€ price increase in the carbon price would translate into an increase in the electricity price of around € 0.465/MWh.

Regional differences exist. When fossil fuel plants are dominant for the final price setting on the wholesale market and their role as marginal plants in the merit order, impacts could be higher than average. To take this into account the Guidelines on certain State aid measures in the context of the GHG emission allowance trading scheme post-2012[71] lists maximum regional CO_2 emission factors in different geographic areas, from 0.56 tCO_2/MWh to 1.12 tCO_2/MWh. A 1€ price increase in the carbon price would in this case translate into at most into an increase in the electricity price of between € 0.56 up to € 1.12 € per MWh. But it

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67 This is the difference between estimated potential emissions and expected free allocation of allowances and the amount of JI and CDM credits that the aviation sector can use annually for compliance.

68 It is assumed that prices for JI and CDM credits are not influenced by price changes of allowances in phase 3. This seems plausible given the fact that prices of JI and CDM credits have started to decouple from allowances prices. See also footnote 35.

69 E.g. Eurofer, contribution to the online consultation.

70 Impact assessment accompanying the Commission Decision determining a list of sectors and subsectors which are deemed to be exposed to a significant risk of carbon leakage pursuant to Article 10a (13) of Directive 2003/87/EC.

71 Guidelines on certain State aid measures in the context of the greenhouse gas emission allowance trading scheme post 2012, Official Journal C154, 05.06.2012, p. 4.

should be noted that are maximum amounts, and in reality price impacts may be lower depending on the mechanisms of price formation in the market.

These figures are conservative in that they do not take into account any effects that transitional free allocation under Article 10c of the EU ETS Directive might have in the Member States applying this derogation.

In order to address potential negative impact from the EU ETS, on industries that require significant amounts of electricity, these guidelines allow for special state aid. 15 sectors (and specific subsectors) were deemed to be exposed to global competition and risk of carbon leakage due to indirect impacts from allowance prices on electricity prices. For 2007, it was estimated that these 15 sectors consumed around 408 TWh electricity[72].

Actual impacts of any price increase early on in phase 3 and price decrease later on in phase 3 from backloading thus will depend not only on the real impact on electricity prices (which can vary depending on energy mix and the manner that prices are set on the concerned electricity market), but also to the extent that concerned Member States will apply these state aid provisions.

No estimates are as yet available for the actual cost impacts on those industries listed in the Guidelines on certain State aid measures in the context of the GHG emission allowance trading scheme post-2012. To make an estimate of potential indirect impacts the following assumptions are made:

- these industries consume 408 TWh yearly,
- a € 1 price increase in the carbon price translates into an increase in electricity prices of € 0.465/MW

Following these assumptions every € 1 change in allowance price due to backloading would translate into a cost increase or decrease for these sectors of € 190 million.

This compares to an existing cost of electricity for EU industry as an end-user[73] between € 52/MWh and € 153/MWh with an average of around € 90/MWh[74]. Applied to the consumption of 408 TWh by the 15 sectors (and specific subsectors) that deemed to be exposed to global competition due to indirect impact from electricity prices, this results in a bill of around € 36.72 billion.

So if carbon prices would only temporarily increase by € 5 (note that they reduce later in phase 3), assuming this would increase electricity prices by € 2.3/MW, this would only increase electricity prices by 2.5% compared to current prices of € 90/MW paid by industry.

But following additional observations should be made:

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72 SWD(2012) 130 final. Sectoral coverage as assumed under the First Intermediate Package in that Staff Working Document. Date based in the first place on Eurostat data for 2007. Note that in 2007 Consumption of electricity by industry, transport activities and households/services was at the highest level for the period 2000-2010.

73 Source: http://www.energy.eu/, end-user energy prices for industrial consumers including all duties, except recoverable taxes (e.g. VAT) for a consumption of 20 GWh/year (± 50%), reference month May 2012.

74 Based on the average of prices listed for 27 EU Member States. Thus not the weighted average.

In countries that apply for transitional free allocation for the modernisation of electricity generation, cost pass through of carbon prices can be expected to be lower, certainly early on in phase 3 (when backloading is expected to increase allowance prices and when relatively high amounts of free allocation to the power sector are still possible under this exemption). These are also typically the countries with some of the highest maximum regional CO_2 emission factors.

Certain industries may have multiple year fixed contracts for electricity, limiting the impact of any short term price fluctuation.

In markets where marginal price setting indeed applies in the electricity market and that have seen rapid penetration of renewables, spot prices can decrease at moments to very low levels.

Countries with whom EU industries are in competition have often also their own pledge and action in place to reduce emissions, often through other policies than only an ETS. This includes renewables and energy efficiency policies. For instance, China has become after the EU the largest destination for renewables investments[75]. China for example also has a significant energy tax in place, bringing additional cost on the electricity price into a similar range as for many EU Member States.[76]

4.6. Social impacts

Emissions trading can have social impacts in many ways; directly thorough the carbon price signal and changes in production and consequently labour markets and indirectly through impacts through electricity and energy expensed and the use of auctioning revenue.

The assessment of the impacts on competitiveness in section 4.5 is also valid for the impacts on the employment in these industries, which project limited or even no direct impacts on sectors exposed to global competiveness.

There is now broad recognition that it is essential to decouple economic growth from the growth in GHG emissions and other unsustainable environmental pressures, and that a successful transition towards a low-carbon economy will necessarily reshape the labour market. As put forward in a report for the European Commission by the OECD, the extra government revenue generated by emissions trading or carbon taxes can be recycled so as to prevent wage earners from bearing a disproportionate share of the cost in this transition, for example by lowering labour taxes by an equivalent amount[77]. Like in Australia, for instance, where over half of the revenue raised by their carbon pricing will be used to assist households[78], the Member States' auctioning revenues could finance an increase in personal income tax thresholds, especially to the advantage of low-income households. Auctioning revenue can also fund socially beneficial public spending for research and development, where experience has shown that the social rate of return on R&D (i.e. including benefits to all potential users) is multiple times the private rate of return[79].

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75 http://www.map.ren21.net/GSR/GSR2012.pdf

76 Report submitted to UK Department for Business Innovation & Skills by ICF International: An international comparison of energy and climate change policies impacting energy intensive industries in some countries

77 OECD, The jobs potential of a shift towards a low-carbon economy: Final report for European Commission, 4 June 2012.

78 http://www.cleanenergyfuture.gov.au/

79 IMF, Fiscal Policy to Mitigate Climate Change, 2012

As explained in section 0, back-loading (options 1-4) is expected to lead to a welcome increase in auctioning revenue in the coming years, i.e. in trying economic times, that can be recycled through reduction in labour cost, or can mobilise early low-carbon RD&D funding, even though the increase in the price early on is expected to be balanced by a decrease later on. Numerous assessments by the Commission have indicated that if used efficiently, the recycling of auctioning revenue can actually spur economic growth and employment[80]

Furthermore it should be stressed that back-loading is expected to result only in a temporal redistribution of price impacts, with higher prices early on and lower later.

4.7. Transitional free allocation for the modernisation of electricity generation

As already indicated in the Staff Working Document on the functioning of the carbon market, Member States that opt to use transitional free allocation for the modernisation of electricity generation (Article 10c of the EU ETS directive) might have an insufficient amount of remaining auction rights early in phase 3 to accommodate a large degree of back-loading based on the distribution of the initial auction rights.

Various straightforward solutions are available to address this issue and one of them was outlined in box 2 of the Staff Working Document on the functioning of the carbon market.

It is estimated that for options 3 and 4, and after application of the transitional free allocation to the power sector, Cyprus would see its amount of auctioning reduced to 0 in the years 2013-2015. Also Poland could see its total auctioning amount reduced to close to 0 in 2013.

For options 5 and 6 and taking into account application of Article 10c only Cyprus is confronted with such a situation and this is due to its particularly high degree of transitional free allocation they apply. Instead for options 1 and 2 and taking into account application of Article 10.c four Member States can see auctioning volumes reduce to 0, i.e. Cyprus, Poland, Estonia and the Czech Republic.

5. COMPARISON OF OPTIONS AND CONCLUSIONS

Table 8 below provides for a comparison of the options in terms of their effectiveness in achieving the objectives of the measures, and coherence with other policy goals, compared against option 0, the so-called baseline option for this impact assessment when no changes would be made in the auctioning timing.

The assessment has identified a variety of reasons for and benefits of back-loading. There are concerns that with the current auction timetable, rather than decrease, the supply of allowances and international credits is expected to increase, and significantly so. This will come on top of the already large surplus of unused allowances due to the effects of economic crisis. A surplus of such a large size is increasingly affecting the orderly functioning of the carbon market. It also affects the cost-effectiveness of the EU ETS, an objective of the EU ETS Directive. Furthermore, the current timetable decreases the profitability of physical

[80] See for instance section 5.1.3 of the Staff Working Document accompanying the Communication ' A Roadmap for moving to a competitive low carbon economy in 2050' (SEC(2011) 288 final) or section 5.4 of the Staff Working Document accompanying the Communication 'Analysis of options to move beyond 20% greenhouse gas emission reductions and assessing the risk of carbon leakage - Background information and analysis - Part II (SEC(2010) 650).

abatement and low carbon investments in the short-term, depresses the auctioning revenue in the early part of the period below what was expected when the Climate and Energy Package was adopted, and increases the risk of fragmentation of climate and energy policies in the EU and resulting competitive distortions.

Back-loading some of the allowances to be auctioned will improve the market balance by slowing down the build-up of the surplus in the early years of phase 3. However, options 5 and 6 with a small change in the auction timetable are not likely to be effective in resulting in sufficient reductions in the surplus to improve the market balance on the short term markedly. Options 2, 4, and 6 that would foresee the return of backloaded allowances only in one year, i.e. 2020, might be comparatively less effective in providing a less steady outcome with respect to the price impact in the last years of phase 3. However they have the advantage of allowing for more time for governments and stakeholders to discuss and decide well-considered and effective structural measures.

By merely changing the timing of the auctions, the free allocation given to the industry will not be touched, nor will the total quantity of allowances. Back-loading is expected to increase the carbon price, compared to the current timetable, in the short-term, but this expected to be balanced with a decrease in the price later on. The impact on individual companies therefore depends both on whether a company is a net seller or a net buyer in phase 3 and also on the timing when a company will bring its supply (including banked allowances from phase 2) on the market or purchase needed allowances, but overall direct impacts seem to be limited to industrial sectors as a whole.

The Commission will continue to monitor and evaluate the functioning of the carbon market in its annual Carbon Market Report, as foreseen under Article 10(5) of the EU ETS Directive. This annual report foresees the explicit monitoring of the functioning of the EU ETS including the implementation of the auctions. If appropriate any proposals aiming at improving the functioning of the EU ETS may be proposed, but of course would require approval by Council or Parliament.

Table 8: Comparison in terms of effectiveness and coherence

	Effectiveness on realising a more stable price development	**Coherence with other policy goals**				
		Auctioning revenue 2013 - 2015	**Importance carbon prices for investment incentives**	**Competitiveness and social impacts**	**Risk of fragmen-tation EU climate policies**	**Potential future structural measures**
Option 1	Reversal increase in surplus and substantial upward price pressure in 2013-2015, but fairly significant downward pressure on the price in 2018-2020	Likely increase compared to situation with decreasing prices	Strong signal	Limited risk on impacts. Higher value of allowances for surplus holders, potential limited impact on electricity prices. Opposite effects at the end of phase 3.	Strong signal against	/
Option 2					Very strong signal against	Can allow for more time for analysing and deciding structural measures
Option 3	Limited reversal increase in surplus, limited upward price pressure in 2013-2015 and moderate downward pressure on the price in 2018-2020	Likely increase compared to situation with decreasing prices	Medium signal	Limited risk on impacts. Limited higher value of allowances for surplus holders, potential limited impact on electricity prices. Opposite effects at the end of phase 3	Medium signal against	/
Option 4						Can allow for more time for analysing and deciding structural measures
Option 5	No reversal of the surplus, continued risk of price decreases in 2013-2015	Uncertain increase early on in phase 3 compared to situation with decreasing prices because prices might still decrease	Limited signal	Very limited	Limited signal against	/
Option 6						Can allow for more time for analysing and deciding structural measures

6. ANNEXES

6.1. Carbon price signal – forecasts by market analysts

Barclays

Table 9: Description of the back-loading amounts assumed by Barclays (in Mt)

Change	2013	2014	2015	2016	2017	2018	2019	2020
400 Mt	-133	-133	-133	80	80	80	80	80
700 Mt	-233	-233	-233	140	140	140	140	140
1200 Mt	-400	-400	-400	240	240	240	240	240

Table 10: Carbon price forecasts by Barclays (prices in €, nominal)

Change	2013	2014	2015	2016	2017	2018	2019	2020
0 Mt	5.5	5	4.5	4.5	4.5	5	7	10
400 Mt	6	5.5	6	5	4.5	5	7	10
700 Mt	7.5	10	11	8	7	7	8	10
1200 Mt	9	14	20	13	9	7	10	10

Source: Derived from figure 27, Barclays, Commodities Research, Quarterly Carbon Standard, 22 June 2012

Bloomberg New Energy Finance

Table 11: Description of the back-loading amounts assumed by Bloomberg New Energy Finance (in Mt)

Change	2013	2014	2015
400Mt	-133	-133	-133
900Mt	-300	-300	-300

Note: The price impact of back-loading is forecasted for this period (2013-2015) only.

Table 12: Carbon price forecasts by Bloomberg New Energy Finance (price in €, nominal)

Change	2013	2014	2015	2016	2017	2018	2019	2020
0 Mt	6.3	6.2	6.7	7.8	9.0	19.5	24.2	29.2
400Mt	7.3	8.6	11.0					
900Mt	8.6	12.6	20.0					

Source: BNEF, September 2012

Thomson Reuters Point Carbon

Table 13: Description of the back-loading amounts assumed by Thomson Reuters Point Carbon (in Mt)

Change	2013	2014	2015	2016	2017	2018	2019	2020
400 Mt	-200	-150	-50	80	80	80	80	80
900 Mt	-400	-300	-200	180	180	180	180	180
1200 Mt	-550	-400	-250	240	240	240	240	240

Table 14: Carbon price forecasts by Thomson Reuters Point Carbon (prices in €, nominal)

Change	2013	2014	2015	2016	2017	2018	2019	2020
0 Mt	4	4	5	6	8	9	10	12
400 Mt	6	8	7	5	6	7	9	11
900 Mt	10	12	11	5	5	6	6	8
1200 Mt	13	14	13	7	5	5	6	8

Source: Thomson Reuters Point Carbon, Cancellation is the magic word, 27 August 2012.

Tschach Solutions

Table 15: Description of the back-loading amounts assumed by Tschach Solutions (in Mt)

Change	2013	2014	2015	2016	2017	2018	2019	2020
500 Mt	-250	-167	-83	0	0	83	167	250
900 Mt	-450	-300	-150	0	0	150	300	450

Table 16: Carbon price forecasts by Tschach Solutions (prices in €, nominal)

Change	2013	2014
0 Mt	4.5	8
500 Mt	9.75	19
900 Mt	13	23.5

Note: Prices are only available for quarters, so the prices for 2013 are an average of all four quarterly prices, while the prices for 2014 is based on the price for the two quarters of that year.

Source: Tschach Solutions, Monthly Market Report September 2012

UniCredit

Table 17: Description of the back-loading amounts assumed by UniCredit (in Mt)

Change	2013	2014	2015
800Mt	-400	-250	-150

Note: The price impact of back-loading is forecasted for 2013 only.

Table 18: Carbon price forecasts by UniCredit (prices in €, nominal)

Change	2013
800 Mt	10

Note: Prices are available for halves of the years, they predict an average price of 9€ in 1st half of 2013 and 11€ in the 2nd. The price for 2013 is an average of the two prices.

Source: UniCredit, Weekly Commodity Outlook, 24 September 2012

6.2. Aviation estimate of potential demand for allowances

Notwithstanding the uncertainty of actual emission levels for the aviation sector up to 2020, the same emission levels are used for this assessment as those included in the Staff Working Document on the functioning of the carbon market, as included in Table 19 below.

From 2013 onwards the cap on allowances foreseen for aviation in the ETS is the equivalent of 95 % of the average historical aviation emissions in the years 2004, 2005 and 2006. This

cap stays constant over the period 2013-2020. It covers departing and incoming flights and has been determined at 209 million allowances a year[81] with 202 million allowances effectually allocated from the start of phase 3 to the sector[82]. 85% of the total is freely allocated and 15% is auctioned. Furthermore the sector may use international credits for compliance the equivalent to 1.5% of its emissions from 2013 onwards.

On the basis of the above assumptions Table 19 gives an overview of the resulting estimate for demand of allowances by the sector.

Table 19: Estimate for the potential demand for allowances by the aviation sector

Total aviation	2013	2014	2015	2016	2017	2018	2019	2020
Allocated allowances	202	202	202	202	202	202	202	202
(1) Free allocation	172	172	172	172	172	172	172	172
(2) Auctioning	30	30	30	30	30	30	30	30
(3) Use of JI-CDM credits	4	4	4	4	4	4	4	4
(4) Emissions	246	251	256	261	266	271	276	280
Demand for allowances = (1) + (3) - (4)	-70	-75	-81	-85	-90	-95	-100	-104

A large proportion of these emissions relate to EU carriers, but the law is non-discriminatory in its application and the precise split between EU and non-EU carriers is not identified. The only relevant differentiation that can be made is between intra EU flights (those both taking off and landing in Europe) and those incoming from and outgoing to airports in third countries. Table 20 below is based on a simplified extrapolation of a potential split between intra EU, outgoing and incoming flights, assuming this is constant over time.

Table 20: Estimate for the potential demand of allowances by the aviation sector for intra EU flights

Intra EU	2013	2014	2015	2016	2017	2018	2019	2020
Allocated allowances	54	54	54	54	54	54	54	54
(1) Free allocation	46	46	46	46	46	46	46	46
(2) Auctioning	8	8	8	8	8	8	8	8
(3) Use of JI-CDM credits	1	1	1	1	1	1	1	1
(4) Emissions	66	67	69	70	71	73	74	75
Demand for allowances = (1) + (3) - (4)	-19	-20	-22	-23	-24	-25	-27	-28

Table 21: Estimate for the potential demand of allowances by the aviation sector for flights to airports in third countries

Going to airports outside EU	2013	2014	2015	2016	2017	2018	2019	2020
Allocated allowances	74	74	74	74	74	74	74	74
(1) Free allocation	63	63	63	63	63	63	63	63
(2) Auctioning	11	11	11	11	11	11	11	11
(3) Use of JI-CDM credits	1	1	1	1	1	1	2	2
(4) Emissions	90	92	94	96	97	99	101	103
Demand for allowances = (1) + (3) - (4)	-26	-28	-29	-31	-33	-35	-36	-38

[81] 2011/389/EU: Commission Decision of 30 June 2011 on the Union-wide quantity of allowances referred to in Article 3e(3)(a) to (d) of Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowances trading within the Community.

[82] 3 % of the total cap for aviation is set aside in a special reserve for aircraft operators and can be released under specific conditions. See also article 3f of the EU ETS directive.

Table 22: Estimate for the potential demand of allowances by the aviation sector flights from airports in third countries

Incoming to EU airports	2013	2014	2015	2016	2017	2018	2019	2020
Allocated allowances	74	74	74	74	74	74	74	74
(1) Free allocation	63	63	63	63	63	63	63	63
(2) Auctioning	11	11	11	11	11	11	11	11
(3) Use of JI-CDM credits	1	1	1	1	1	1	2	2
(4) Emissions	90	92	94	96	97	99	101	103
Demand for allowances = (1) + (3) - (4)	-26	-28	-29	-31	-33	-35	-36	-38
Intra EU	2013	2014	2015	2016	2017	2018	2019	2020