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Carbon & Energy Markets – Carbon Insight

EUA at €15 /t in 2020, €12.6 /t on average over Phase III

- Carbon prices have plunged to all-time lows recently, below €7 /t for Dec12 EUA. The large combined oversupply in allowances and credits, very probably extending to 2020, has led to considerable downward pressure. Even if the existence of the oversupply is not new, the worsening of the short-run economic outlook in the EU and the continued rapid penetration of renewable power, beating forecasts, has pushed many observers to conclude there was no likelihood that prices could significantly recover. This durably changed market participants' anticipations of future price levels

- In this paper we update our supply-demand forecasts to 2020 in the light of the recent evolution in the economy and energy markets. We conclude that the EU ETS will indeed be even more oversupplied than we were previously expecting – even if we were already anticipating a long market to 2020. The cumulated Phase II / Phase III excess reaches 879Mt. importantly, the market for us is still short by 870Mt before the inflow of offsets (CER and ERU) but the purchase and surrendering of the estimated 1,750Mt of offsets over the 2 Phases will lead to oversupply. CER and ERU are thus essential to achieving compliance in the EU ETS. Conversely, as long as enough CER and ERU eligible in Phase III are generated, which is our conclusion as we expect oversupply of CER globally, offsets will be sufficient to meet compliance: no emission reductions will be necessary locally in the EU until at least 2020

- As a consequence of the lower emission path, we are revising down our price forecasts for 2020. We now see EUA at €15 /t in 2020, and CER at €3 /t at this horizon. Over Phase III, EUA will average €12.6 /t, and non-industrial CER €6.7 /t. These price forecasts and their dynamics in the last years of the decade already imply strong hypotheses on the existence and on the rules of a Phase IV, post-2020. Barring the confirmation of the existence of such a Phase – and the necessary condition that market participants are collectively convinced is it likely to happen – prices in an oversupplied market could rapidly fall further from present levels, to values close to zero, as happened in Phase I

- Following the tabling by the European Parliament in December of a cut in distributed EUA volumes to 2020 to account for the impact of a possible Energy Efficiency Directive, it appeared interesting to us to look at the price impact of such a measure. At present we have considered the most likely outcome (even if adoption is still far from certain) of a "set-aside" of 1.4bn EUA, i.e., the withholding of volumes at the beginning of the Phase for later distribution. This makes it possible to address short-term oversupply in the market without altering the global supply-demand, hence without the need to resort to a change in the Directive. The result is a jump in prices in 2013, then higher prices until 2016 (EUA at €15 /t then) compared to the base case. By contrast, the end of the Phase will be characterized by much lower price levels (EUA at €10 /t) as important volumes are released in a limited time-frame. Only if a way to smooth out the set-aside volumes into Phase IV was found could prices prove more resilient.

Emissions trend: down in Phase III

We have recently reviewed our emission forecasts downward for 2011 and 2012 (end of Phase II) due to the slow growth in 2011 and recession expected in Europe in 2012 (see our Carbon Special dated 21 November 2011 Financial stress and recession carbon prices revised down by €3.5t for EUA).

We have now also reviewed our baseline emissions forecasts to 2020 in depth, to account for structural changes in the market. By the end of Phase III, we expect emissions to be lower by 5% compared to 2012. Total cumulated emissions should amount to 18,380Mt over Phase III. Beyond the economic situation, emissions over the period will unsurprisingly be dampened by 1) decreasing carbon intensity in power generation and 2) higher energy efficiency.

Gross energy demand: power and fossil fuel demand in the EU ETS sectors

Gross power demand linked to GDP

To forecast the gross power demand that will lead to emissions of the combustion sector from 2013, we use a gross long-term elasticity of power demand to GDP (i.e., pre-energy efficiency improvements on the demand side) of 0.35 in the EU. This stands between the values used by the International Energy Agency (0.6 in the World Energy Outlook 2009, pp. 62 and 96) and the one used by the Energy Information Agency of the US Department of Energy (0.25 in International Energy Outlook 2009, internet site). We use SG economic team's growth forecasts, which expect EU27 GDP to increase by 0.7% in 2012, 1.5% in 2013, 1.9% in 2014, and 2.1% in 2015. Then we use 2% as an average forecast from 2016 to 2020.

SG EU27 GDP growth forecasts							
Year	**2009**	**2010**	**2011f**	**2012**	**2013**	**2014**	**2015**
EU 27 GDP change	-4.2%	1.8%	1.7%	0.7%	1.5%	1.9%	2.1%

Source: SG Cross Asset Research

The above GDP growth projections yield an average 0.7% EU gross power demand growth between 2013 and 2020.

Fossil fuel demand by other emission sources

Part of the CO2 emission sources relevant to the EU ETS are industrial emissions. This is non-power (primary) energy demand from industry (direct oil and gas demand in heating plants or production machinery, for instance), process demand for fossil fuels (e.g., gas as a feedstock in the chemical industry), and fugitive emissions / losses from the energy industry (e.g., gas leaks in network sub-stations). All this represents less than one-third of EU ETS emissions today, as transportation and direct household demand are not covered by the market.

Here we use a gross elasticity of demand for these emission sources to GDP of 0.5 (i.e., demand increases by 0.5% when GDP increases by 1%) as we estimate the technological progress conducive to an improvement in heat rates (thermal efficiency) is lower in these processes, leading to a more direct response of emissions to GDP variations. This yields an average gross increase of energy demand from these sources of 1% over the period.

Aviation sector - an increasing part of the European emissions

The aviation sector will be included in the EU ETS from 2012. Aviation is expected to add 250Mt to the scheme in 2012 and will account for an increasing part of EU emissions. We expect air traffic within Europe, and to and from the continent to increase by 3% on average between 2013 and 2020.

From gross demand to net demand: demand-side energy efficiency

Energy efficiency indirectly dampens emissions by reducing demand for power and primary energy sources. In the absence of the adoption of a binding energy efficiency Directive, like that proposed on 22 June 2011 (but not confirmed up to now), we expect the EU to meet 50% of the EU target. Energy efficiency will thus lower European energy demand growth by 0.5% per year from 2013 to 2020.

Hence, taking energy efficiency into account results in average 0.2% growth in net power demand per year and average 0.5% growth in net fossil fuel demand per year for industrial activity – we have applied the gains uniformly throughout the sectors.

For aviation, we also assumed energy efficiency improvements of 0.5% a year due to the rapid progress in engine efficiency in a fleet that continues to rapidly increase in size, hence a net 2.5% growth of energy demand over the period.

EU energy demand average growth forecasts 2013-2020 (%)

	Gross	Net
Power	0.7%	0.2%
Other energy from industrial sectors	1%	0.5%
Aviation	3 %	2.5%

Source: orbeo

Renewable penetration reduces the carbon intensity, nuclear exit increases it

Renewable performance is strong

For a given net energy demand, as calculated above, the mix of the primary energy supply will determine the carbon emissions.

Carbon emissions from power production will be lessened by growing renewable penetration. In 2020, according to the 27 National Renewable Energy Action Plans (NREAP), 34% of the EU's total electricity consumption (expected to be 3,529TWh in 2020) will come from renewable energy sources. According to the European Commission, this goal is likely to be reached and might even be slightly exceeded. Indeed, at the present pace we expect almost 37% of electric energy to come from renewables in 2020: 29% from hydro generators, 49% from wind, 8% from biomass and 14% from solar.

Although EU renewable targets haven't changed, the speed of renewable penetration has significantly increased and is likely to see sustained growth until 2020, thanks to strong political backing. In 2010, more renewable generating capacity was installed in the EU than ever before. With 22,682MW of new generating capacity, renewables represented 41% of total new installed capacity, mainly solar (12 GW) and wind (9.3GW) (EWEA, 2011). 2010 was a record-breaking year for offshore wind power as well. According to the EWEA, during H1 2011, 348MW of offshore wind power became fully grid connected; meanwhile, 11 offshore wind farms were under construction which, once connected, will add 2.8GW of extra capacity to the already existing 3.3GW, an 86% increase.

New renewable capacity will serve to meet additional power demand in Europe, as well as replacing decommissioned capacity over the next nine years (mostly coal and nuclear). Using the average carbon intensity of European electricity generation, we estimate that growth of renewable energy production in Europe will reduce emissions by 303Mt by the end of Phase III (cumulative emissions in 2020) compared to a level of emissions assuming a constant energy mix of power production.

Impact of 2011 decisions on nuclear exit: only Germany matters at 2020 horizon

Despite significant growth in renewables, the trend towards decarbonised power will be impacted by the recent decisions to exit nuclear energy in some countries.

On 30 May 2011, Germany decided to exit nuclear. In the carbon part of the commodity review published in June, we estimated that Germany's decision would add 315Mt of CO2 before the end of Phase III.

In 2011 a number of other countries announced an exit from nuclear technology, such as Switzerland in March and Belgium in October, but the horizon of the implementation (respectively 2034 and 2025) is too far to affect our forecasts.

Result: EU ETS emissions peaking in 2013, and probably have peaked already for Phase II market perimeter

The results of the different assumptions described above are summarized in the table below showing the EU ETS emissions forecasts at the Phase III perimeter, i.e., including new sectors and gases in addition to aviation. In this table we have also included Norway.

EU ETS Phase III perimeter emissions forecast (including Norway, aviation from 2012, new sectors and gases from 2013)

Year	2011f	2012f	2013f	2014f	2015f	2016f	2017f	2018f	2019f	2020f
EU27 emissions at constant energy mix (Mt)	1 994	2 264	2 416	2 425	2 430	2 445	2 453	2 463	2 460	2 466
Renewable power growth (TWh)	18	21	26	31	37	44	53	63	75	90
Corresponding emission reductions (Mt)	5	15	17	21	25	30	36	43	52	62
Cumulated emission reductions (Mt)	5	20	37	58	83	112	148	191	243	305
Phase III perimeter emissions (Mt)	**1 989**	**2 244**	**2 379**	**2 367**	**2 347**	**2 333**	**2 305**	**2 272**	**2 217**	**2 161**

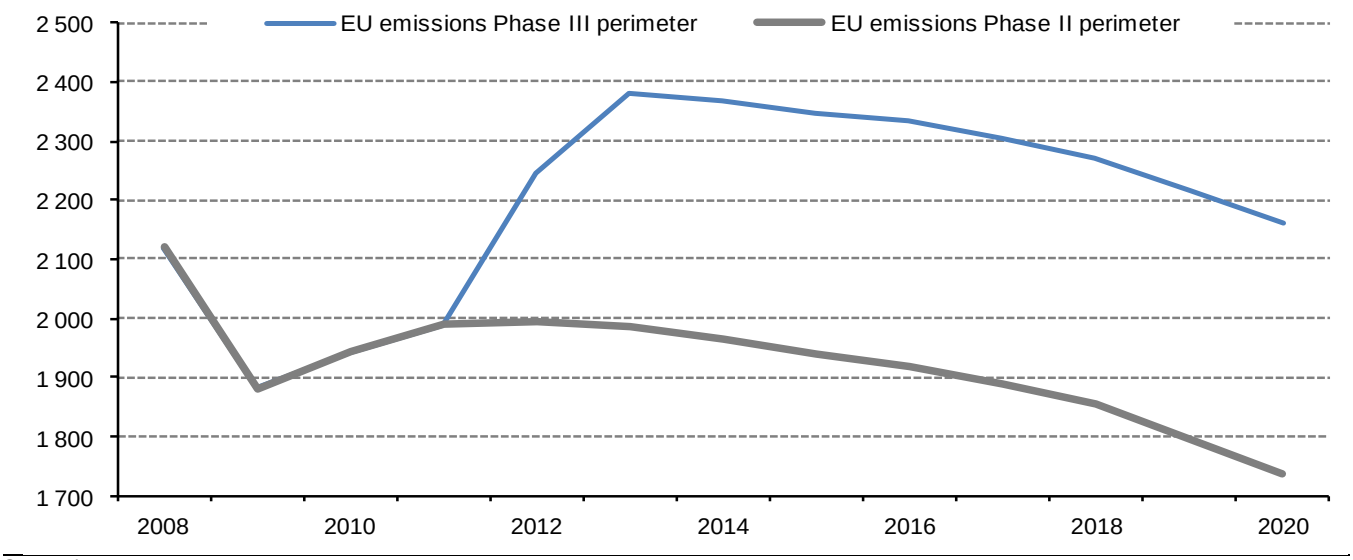
Source: SG Cross Asset Research

EU ETS baseline emissions are seen to peak at 2,379 Mt in 2013 (with the addition of newly capped sectors) and then start effectively decreasing until 2020. In 2012 aviation emissions will represent 11% of total produced emissions. At 315Mt in 2020, their share will grow to 14.5% because of a much more dynamic growth rate than the other sectors.

Below we show the emission path for the Phase III perimeter and indicate the comparison with the Phase II perimeter ex-aviation.

At Phase III perimeter, the jump in 2012 is due to aviation (first change in perimeter) and the further increase in 2013 is due to the addition of new sectors and gases. But the underlying trend is a decreasing one, as is obvious from the graph.

Dec12 EUA evolution since December 2011 (€ /t)



Source: orbeo

EUA balances: market short over Phase II + III… before offsets

We now take a look at EUA balances in the EU ETS before offsets, in order to determine the gross shortfall or excess during the period. For this we compare emissions to the available volumes of allowances.

Total number of allowances distributed progressively reduced

Supply expected at present: 17Gt Phase III EUA

The total number of allowances that will be available for EU ETS operators in Phase III stands at 1,927Mt for the year 2013 for the present EU ETS perimeter, and then decreases by 1.74% per year (35.4Mt). In 2020, the volume of allowances released in the market will thus be 1,679Mt for this perimeter. Regarding new sectors and gases, the allowances available will be 112Mt for 2013, decreasing to 93Mt for 2020. The aviation cap is constant over Phase III at 208Mt per year.

On the whole, 17,024Mt will be distributed in the ETS for Phase III. In practice, this will happen from 2011 to 2020 as "early volumes" are being sold already in order to cater for the needs of some actors seeking to hedge price risk ahead of 2013. In total, 420Mt should be sold prior to 2013. 300Mt will be sold by the European Investment Bank for Carbon Capture and Sequestration projects financing purposes (monetizing the so-called New Entrants Reserve), with this having started in December 2011. 120Mt will be sold through early auctions, to be held probably in the second part of 2012.

All our tables below provide a compliance view, i.e., which allowances are available for compliance in each year, irrespective of the year of actual distribution. This is because Phase III allowances cannot be used for Phase II compliance. Even if their early distribution meets a definite need (hedging), showing them in 2011 or 2012 volumes could prove quite misleading.

EU ETS allowance allotments – new sectors and gases, Norway, aviation (Mt)

Year	2011e	2012f	2013f	2014f	2015f	2016f	2017f	2018f	2019f	2020f
Existing perimeter allowances	2 087	2 217	1 927	1 892	1 856	1 821	1 786	1 750	1 715	1 679
Norway allowances	8	8	14	14	14	14	14	14	14	14
New sectors and gases allowances	0	0	112	110	107	104	101	99	96	93
Aviation allowances	0	213	208	208	208	208	208	208	208	208
Total	**2 095**	**2 437**	**2 261**	**2 224**	**2 185**	**2 147**	**2 109**	**2 071**	**2 033**	**1 994**

Source: orbeo, European Commission

A new scenario: withholding or cancelling 1.4 billion allowances?

Following the rapid and significant fall in carbon prices since the summer, many voices have emerged from the carbon industry, environmental groups as well as lawmakers to defend a regulatory intervention to get rid of the crippling oversupply and restore some meaning to market functioning. While the "set-aside" discussion has not met with success so far, a new legislative opportunity might be opened by the Energy Efficiency Directive discussion.

Considering that the new Directive would impact the EU ETS if no changes are made to supplied volumes, the European Parliament has started voting on several changes that would result in a set-aside and possibly (depending on the fate of the proposed amendments) an outright reduction in the number of permits distributed until 2020. On 20 December 2011, the ENVI Committee adopted several amendments (to Article 19 of the Auction Regulation and Article 9 of the ETS Directive) that could lead to 1.4bn of allowances being delayed (first amendment) or even cancelled (following amendments). We are just at the beginning of the process (the next vote is set for 28 February in the Industry, Research and Energy (ITRE) Committee – the industry one) and not all the proposed amendments will survive as such. In particular, due to the narrow voting results on the amendments proposing to retire the allowances, it seems likely that this part of the proposal will not survive. Some 1,810 changes have been proposed to the texts voted on 20 December, showing that the path to legislation before the plenary vote on 17 April will be a tough one.

In the rest of this document, we consider a scenario that assumes the implementation of the "set-aside" rather than the outright cancellation of permits, which we consider far less likely at this stage. We present the set-aside scenario as an alternative to our base case scenario.

Below we show a table where the hypothesis is that the set-aside happens in the following fashion: 500Mt not distributed in 2013 and 2014, and 400Mt not distributed in 2015, with these volumes then symmetrically released back to the market in instalments of 400Mt in 2018, 500Mt in 2019 and 500Mt in 2020. In practice, the allowances are thus transferred through time and "back-loaded" to a period when the market is expected to be tighter. Intuitively the consequence of this will be to smooth prices out to 2020: uplift in the short term if the measure is implemented but lower prices than could initially be expected further down the line, as the volumes will weigh negatively on prices in 2019 and 2020.

EU ETS allowances allotments with set-aside – new sectors and gases, Norway, aviation (Mt)

Year	2011e	2012f	2013f	2014f	2015f	2016f	2017f	2018f	2019f	2020f
Existing perimeter allowances	2 087	2 217	1 927	1 892	1 856	1 821	1 786	1 750	1 715	1 679
Allowances set aside	0	0	-500	-500	-400	0	0	400	500	500
Norway allowances	8	8	14	14	14	14	14	14	14	14
New sectors and gases allowances	0	0	112	110	107	104	101	99	96	93
Aviation allowances	0	213	208	208	208	208	208	208	208	208
Total	**2 095**	**2 437**	**1 761**	**1 724**	**1 785**	**2 147**	**2 109**	**2 471**	**2 533**	**2 494**

Source: orbeo

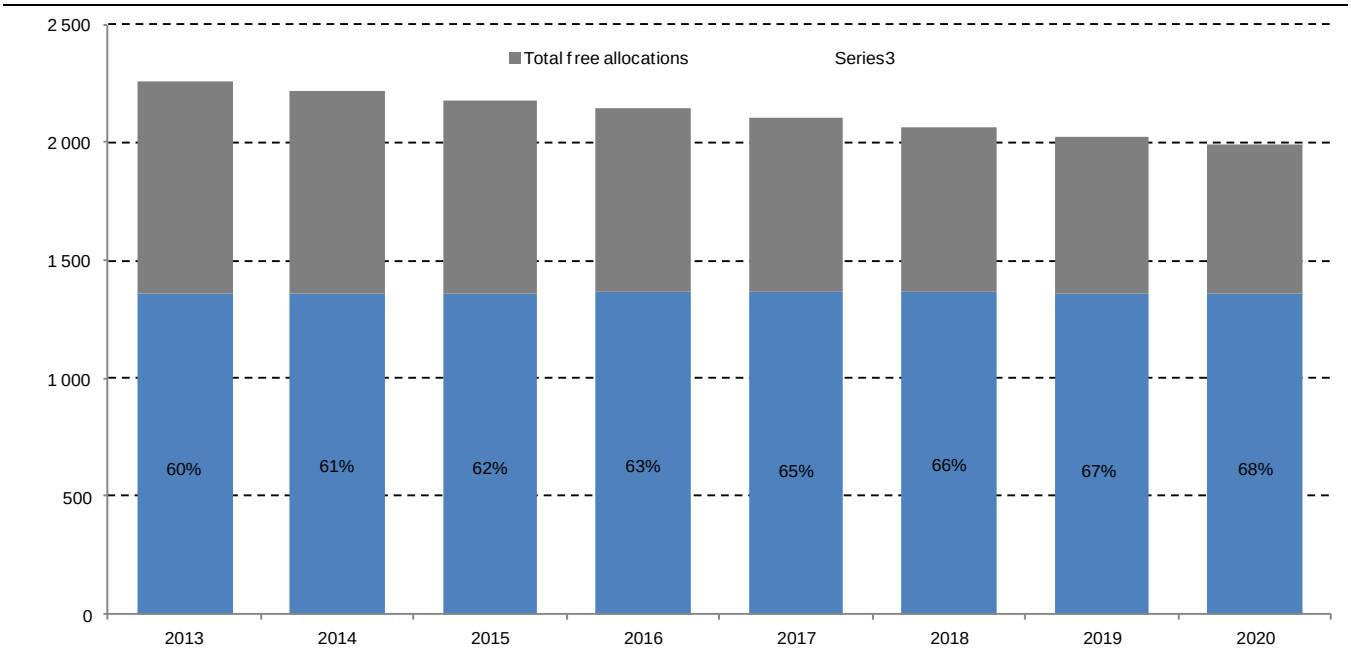
Phase III based on auctions at more than 60%

In Phase II, a large majority of EUA allowances are being distributed for free to EU ETS installations. Only a few countries decided to put significant volumes up for auction, such as Germany (200Mt), the United Kingdom (87Mt), Norway (32Mt) and the Netherlands (16Mt). Others like Ireland, Austria, Hungary and Denmark have not exceeded the 3Mt mark, individually. Overall, the share of auctioned allowances (345Mt) does not exceed 3.5% over Phase II.

This share will evolve considerably for Phase III allowances. Below we represent our estimated evolution of auctioned levels for Phase III. These figures were determined by applying the Phase III provisions to 2007 emissions and allocations by sector and country.

We estimate that between 60% and 68% of allowances will be auctioned over the period, with a 60% level initially, going up to 68% in 2020. To be noted is that the auctioned levels will ultimately depend on the price of CO2. If the price increases, the number of installations exempted from auctions based on the carbon leakage criteria will increase, and the proportion of auctioned volumes will decrease.

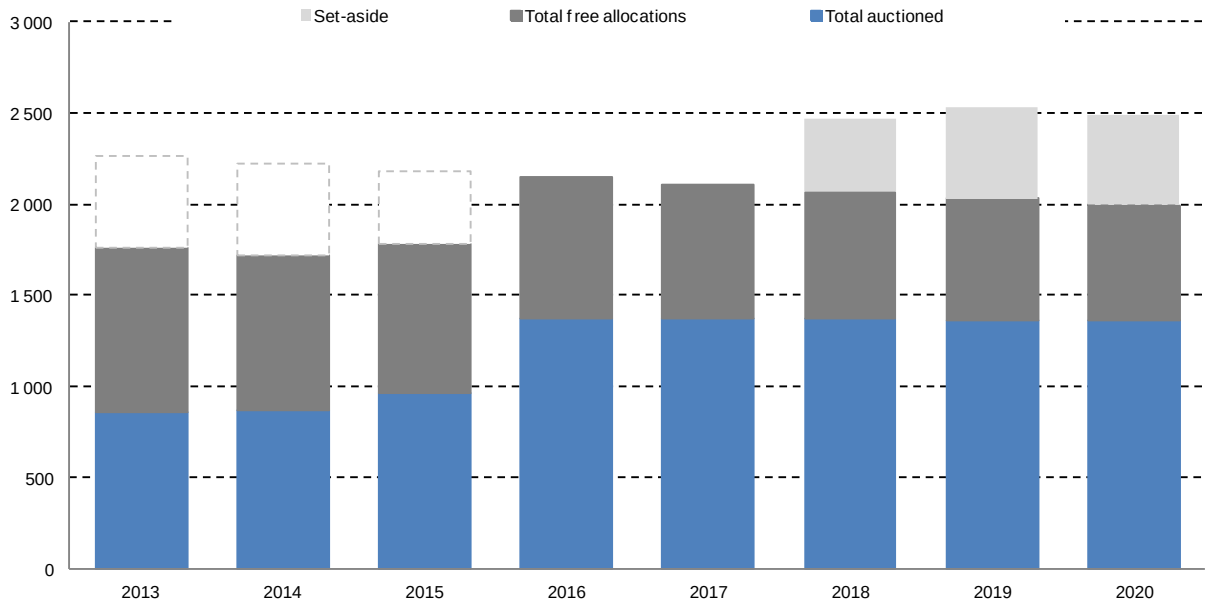
Evolution of auctioned levels for EUA allocated to Phase III (Mt)



Source: orbeo

In case of a set-aside, we propose the auction distribution schedule below.

Evolution of auctioned levels for EUA allocated to Phase III – with set-aside (Mt)



Source: orbeo

This clearly makes it possible to reduce the Phase II oversupply which is a concern right now, as we will show in figures below. However, it would lead to very large volumes at the end of the period. One might thus wonder if further spreading of the set-aside volumes into a later market phase post-2020 would not be welcome – we will confirm this by looking at the supply-demand balances to 2020. However this requires confirmation of the existence of a Phase IV, and probably the modification of the EU ETS Directive in order to be able to alter the volume of allowances distributed until 2020 (as in the case of a cancellation of EUA / deepening of EU ETS targets). By contrast, releasing the set-aside volumes by 2020 only requires changes to the auctioning regulations. This means an agreement reached by the Member States through the Comitology process, then final validation by the European Parliament after a three-month comment period. However, this remains much simpler than taking the risk of opening the Directive again, a real Pandora's box.

EUA balances pre-offsets: 486Mt excess over Phase II, 870Mt short to 2020

Market short in EUA every year from 2013 but Phase II excess absorbed only in 2016

For Phase II, our emissions estimates reach 10,176Mt with a 10,662Mt EUA cap, which leads to a 486Mt EUA excess, before taking offsets into account. For Phase III, estimated emissions are at 18,380Mt while the EUA cap is 17,024Mt, leaving the market short of 1,357Mt before the banked volumes from Phase II and offsets imports. Over the whole 2008-2020 period, the gross EUA shortfall is thus 870Mt. Seen annually, the market is short in EUA every year from 2013, but the 486Mt Phase II excess helps balance it to 2016, without the need for offsets.

EU ETS balance forecast until 2020 in the 20% scenario (Mt)

Year	Total Phase II	2013f	2014f	2015f	2016f	2017f	2018f	2019f	2020f	Total Phase III	Total 2008-2020

Expected emissions (a)	10 176	2 379	2 367	2 347	2 333	2 305	2 272	2 217	2 161	18 380	28 556
Free allowances (EUA) without aviation (b)	9 608	689	650	611	573	536	501	466	432	4 460	14 068
Auctioned allowances (c)	355	1 267	1 271	1 273	1 275	1 275	1 274	1 273	1 270	10 178	10 533
Allocated NER (included in NAP) (d)	399									0	399
Remaining NER (e)	88	96	95	93	91	89	88	86	84	721	809
Allocated Aviation allowances (f)	212	202	202	202	202	202	202	202	202	1 614	1 826
Special Reserve Aviation (g)	0	6	6	6	6	6	6	6	6	50	50
Compliance Demand (h)=(a)-(b)-(c)-(d)-(e)-(f)-(g)	**-486**	**118**	**143**	**162**	**186**	**197**	**200**	**185**	**167**	**1 357**	**870**

Source: orbeo

Despite the excess indicated above, the forward hedging needs of some participants (utilities chiefly) had led to the concern that 2011 and 2012 could be tight in allowances, considering that not all the excess is marketed by its holders (industrials) and that utilities needed some Phase III vintage for hedging accounting reasons. The fact that the European Investment Bank has now started the sale of a first batch of 200 million Phase III allowances, to be sold in 10 months, is taking care of this.

Annual balances if 1.4 bn allowances are set-aside in Phase III: initially tighter

In the case of a set-aside, global balances are not changed but, as shown below, the market is initially much tighter in EUA.

EU ETS balance forecast until 2020 in the 20% scenario with set-aside (Mt)

Year	Total Phase II	2013f	2014f	2015f	2016f	2017f	2018f	2019f	2020f	Total Phase III	Total 2008-2020
Expected emissions (a)	10 176	2 379	2 367	2 347	2 333	2 305	2 272	2 217	2 161	18 380	28 556
Free allowances (EUA) without aviation (b)	9 608	689	650	611	573	536	501	466	432	4 460	14 068
Set-aside (c)	0	-500	-500	-400	0	0	400	500	500	0	0
Auctioned allowances (d)	355	1 267	1 271	1 273	1 275	1 275	1 274	1 273	1 270	10 178	10 533
Allocated NER (included in NAP) (e)	399									0	399
Remaining NER (f)	88	96	95	93	91	89	88	86	84	721	809
Allocated Aviation allowances (g)	212	202	202	202	202	202	202	202	202	1 614	1 826
Special Reserve Aviation (h)	0	6	6	6	6	6	6	6	6	50	50
Compliance Demand (h)=(a)-(b)-(c)-(d)-(e)-(f)-(g)-(h)	**-486**	**618**	**643**	**562**	**186**	**197**	**-200**	**-315**	**-333**	**1 357**	**870**

Source: orbeo

Taking into account our set-aside hypotheses, the shortfall stands above 600Mt in 2013 and 2014, against a cumulated EUA excess of 486Mt from Phase II (the excess is thus synthetically absorbed in the first year) while the market is long, seen on a yearly basis, from 2018.

Offset balances: accelerating supply, limited non-ETS demand

Based on our demand estimation, the market is short in EUA by 870Mt over Phase II and III combined. The CER and ERU import capacity of the EU ETS equals approximately 1,750Mt over 2008-2020, according to the ETS Directive. Due to eligibility criteria, we have to distinguish two types of CER: industrial gas CER eligible only over Phase II, and the rest of CER eligible for both Phase II and Phase III. The amount and the timing of these CER issuances will be key.

In order to estimate the supply of CER available for the EU ETS in Phase III, we made assumptions on the volume of CER coming from eligible projects expected to be registered by end 2012, and, for projects registered after 2012, from projects developed in LDC countries – the only ones accepted to date in the EU ETS.

Offset supply: largely more than enough…

Reminder: Phase II offset issuances at 1 365Mt

Following the acceleration of CER issuances in 2011 (by the CDM EB) and ERU (from Russia, Ukraine and Poland), our present estimate for CER to be issued since the beginning of the CDM to 2012 is 1,365Mt, of which 777Mt industrial gas CER, 347Mt other CER (31% of CER), and 241Mt ERU. Compared to our low point estimate for CER issuances some months ago, we have raised this figure by close to 200Mt over the period. This is because their generation has doubled from 160Mt to 320Mt from 2010 to 2011. However, due to the present price level, we still think issued volumes will be lower in 2012 and we put CER generation at 280Mt for the coming year. Most of them will still be of an industrial nature, as these cease to be eligible after mid-2013. ERU will continue their ramp-up in 2012, with an expected 120Mt issued.

CER and ERU issuance forecast from 2008 to 2012 (Mt)

Year	2005-2008	2009	2010	2011e	2012f	Total 2008-2012
Industrial gas CER*	38	13	66	120	110	347
Phase II and III eligible CER	202	111	94	200	170	777
All ERU	1	4	26	90	120	241
Total	**241**	**128**	**186**	**410**	**400**	**1 365**

Source: orbeo; *CER from HFC and adipic acid plants

Eligible projects registered from 2011 could deliver 1 170Mt CER over 2013-2020

Based on the Point Carbon database, we estimate the volume of CER in the pipeline and what we expect in terms of new registrations from 2013. We expect the speed of new projects registration to slow compared with what we have observed over the past two years, due to present price levels (like for issuances in 2012). Based on these market conditions we expect the volume of CER from new projects based in LDCs to be on average divided by two relative to 2011 and 2012. We estimate the volume of CER coming from new LDC projects to reach 401Mt over Phase III. Overall, we anticipate the supply of Phase III eligible CER to the EU ETS to be 1,170Mt over Phase III. This compares to 347Mt for the same type of projects over the five years of Phase II. This is hence a significant acceleration for projects which are bound to remain less productive than industrial gas ones due to their smaller size, higher fixed costs, lower performance relative to PDD and longer gestation periods.

EU ETS Phase II and Phase III eligible CER issuance forecast to 2020 (Mt)

Year	2013f	2014f	2015f	2016f	2017f	2018f	2019f	2020f	Total 2013-2020
Already registered non-LDC projects	135	130	122	106	88	65	43	30	719
Already registered LDC projects	7	7	7	7	7	7	5	3	50
Post-2012 LDC projects	76	71	66	58	49	36	26	19	401
Total	**218**	**208**	**195**	**171**	**144**	**108**	**74**	**52**	**1 170**

Source: orbeo

ERU: Kyoto 2 not a source yet, but some AAU conversion to b e expected post-12

To the CER volumes, we have to add ERU issuances from 2013 usable in the EU ETS. Until Durban the status was that, as long as further regulation was not adopted in the absence of a second commitment period (as the JISC was advocating), no further JI project registration was possible post-2012. Indeed, technically, a new batch of AAU would have been needed as ERU require the existence of AAU to be generated. The pledge of a second commitment period at Durban, if only restricted to the EU, Switzerland and Norway as of now, may have implications on this front however: the continuation of the framework might lead to the creation – once again, only at the European level for now – of new AAU, leading to the possibility to develop and determine new JI projects in this perimeter. In other words, this would be the continuation of domestic projects in the EU countries which favour them, bar for the sectors which will join the EU ETS from 2013, such as, importantly, N2O emissions from adipic and nitric acid plants. This implication is still very much in limbo however. It is worth noting that the question of JI continuation has been left unresolved at Durban, as the EU at this stage does not want to commit to take additional offsets. As a result, pending further clarification, we do not consider new JI projects post-2012 as of now in our balances.

One source of ERU will remain, though: those generated from emission reductions reputedly achieved before end 2012 from already registered JI projects. These ERU will be generated from the stock of AAU existing for 2008-2012, and available until the Kyoto true-up, some time around mid-2015. The European Commission is clearly concerned by the potential avalanche of credits coming from Russia in particular – ERU providing an opportunity to monetize part of the AAU excess of the country. Specific restrictions on the use of this type of ERU might be passed; they have already been evoked. In any case, one has to account for some ERU volumes issued until 2015 by Ukraine and Russia. We have estimated them at 200Mt, basing our hypothesis both on the official JI ceiling announced by Russia up to now (300Mt) – still largely unused - and on the pace of the Sberbank-managed issuance process.

Including Phase II, the total supply of offsets eligible for the EU ETS (CER and ERU) should reach 2,735Mt, equally split between the two phases (1,365Mt and 1,370Mt). This of course means a slower issuance rate over the last eight years than in the first five.

Offsets not eligible for Phase III of the EU ETS: a tail of 180Mt from 2013 to 2016

In 2010 the European Commission decided to ban HFC and adipic N2O CER and ERU for the Phase III of the EU ETS from 1 May 2013. Prospects for demand outside the EU ETS have considerably faded as the countries that could have used them (EU nations, Australia, Japan, and more recently New Zealand) have announced they will restrict their purchase to CER types eligible in the EU ETS, de facto excluding these CER and ERU. We consider that these projects will stop being developed.

Hence the amount of this type of CER will decrease over time as the present project crediting periods come to an end. Our estimate for the issuance of this type of CER is a total 180 Mt from 2013 to 2016, based on project crediting periods – basically an extinction of this source of CER, for which there will be a very limited market. As for ERU, the only non eligible type to date is N2O abatement in adipic acid plants in Annex I countries (no HFC plants in Annex I countries). These will disappear from 2013 as these sectors are integrated into the EU ETS.

CER and ERU issuance forecast to 2020 (Mt)

Year	2008	2009	2010	2011e	2012f	2013f	2014f	2015f	2016f	2017f	2018f	2019f	2020f	Total 2008-2012	Total 2013-2020	Total 2008-2020
Industrial gas CER	202	111	94	200	170	100	45	22	10	2	1	0	0	757	180	937
Phase II & III eligible CER	38	13	66	120	110	218	208	195	171	144	108	74	52	347	1 170	1 517
All ERU	1	4	26	90	120	120	80	0	0	0	0	0	0	241	200	441
Total	**241**	**128**	**186**	**410**	**400**	**438**	**333**	**217**	**170**	**146**	**109**	**74**	**52**	**1 365**	**1 550**	**2 915**

Source: orbeo

On the whole, this means 2,735Mt eligible offsets, and 180Mt ineligible offsets from May 2013. These will have to find a market outside the EU ETS from 2013.

Non-EU ETS demand for offsets: quite limited seen from here

396Mt required outside the EU ETS until 2020

Up to now we have identified the offsets eligible to the EU ETS, both in Phase II (all of them) and in Phase III (non industrial ones only). However in order to estimate the eventual availability of offset to the EU ETS, one has to subtract from this CER and ERU bought outside of the EU ETS, i.e., by countries for their Kyoto needs until 2012 and possibly for their needs under alternative schemes.

The most significant of these in terms of volumes to date probably stems from the EU 20% emission reduction objectives to 2020. It is possible for Member States to use credits as stated in the 2008 Climate-Energy package – up to 3% of their emissions as a general rule. Other existing market systems such as New Zealand, and possibly upcoming ones (Australia, parts of China and South Korea in 2015?) might also represent demand to 2020, at least for non-industrial gas CER.

In the table below we give our view of the possible demand. The potential is large – for instance the EU countries could in theory buy up to 1Gt credits from 2008 to 2020. However the actual needs or desired to resort to CER for compliance might lead to quite lower actually purchased volumes.

Non-EU ETS CER and ERU demand forecast over Phase II and Phase III (Mt)

Year	2008	2009	2010	2011e	2012f	Total 2008-2012	Total 2013-2020	Total 2008-2020
Governmental purchase	10	20	50	20	20	120	200	320
Japanese corporate purchase	42	34	0	0	0	76	0	76
Non EU ETS demand	**75**	**71**	**50**	**20**	**20**	**196**	**200**	**396**

Source: orbeo

The first 196Mt can be assumed to be bought in priority in the industrial gas CER and ERU pool. However the 200Mt post 2012 will mostly be taken from the eligible supply. In total, we can thus count on 2,339Mt offsets available for the EU ETS:

581Mt industrial gas CER, 241Mt ERU, and 347Mt non-industrial gas CER in Phase II (1,169Mt total); 1,170Mt for 2013-2020 (assuming non-ETS demand is expressed in priority): 200Mt ERU and 970Mt eligible CER. Hence the total CER/ERU limit will probably be imported over 2008-2020 given the price arbitrage offsets offer for EU ETS compliant buyers.

769Mt offset oversupply, of which probably as much as 589Mt Phase III eligible CER

Alternatively, we can conclude that the offset oversupply will be as high as 769 Mt over the period. While they will be used as much as possible for Phase II, 180Mt industrial CER will end up without a market after May 2013. Also 589Mt of Phase III eligible CER and ERU will be in excess of demand over 2008-2020. Part of them will already be in excess at the end of Phase II, but banked to Phase III: the total offset demand in Phase II (EU ETS plus other demand) will be 1027Mt, while 1365Mt will be generated, hence 338Mt banked.

However the total demand over 2013-2020 is expected by us at 1119Mt (919Mt from the EU ETS, 200Mt from other systems), while 1550Mt will be issued. Removing the banked volumes, which puts the actual remaining demand at 781Mt, we see that 769Mt are not required (1550Mt minus 781Mt), of which 589Mt Phase III eligible CER and ERU. This will probably entirely concern Phase III eligible CER eventually as ERU should keep a price advantage to them.

Hence, contrarily to a common idea, eligible CER will probably be more oversupplied than industrial gas ones. These came earlier in the scheme and will absorb a large part of the demand until 2016, while eligible CER, at first sight scarcer, come too late and will primarily suffer from the 1750Mt import limit.

In other words, coming back to the anticipated CER supply from now as shown above, we can see that all the LDC projects expected to be registered post-2012 (401Mt) are not required in the base case until 2020. They will only add to the oversupply. If new entry into the CDM pipeline was stopped today, the supply already implied by its present volume of projects (under our assumed performance rates) would be more than enough to meet total demand to 2020. Only the hope of higher prices later, of a change in regulation allowing more offsets, of bad performance by competitors, or classically myopic analysis could be said to today lead project owner and developers to continue setting up new projects. One of these radical changes in the market conditions is needed for their bet to pay off eventually – seen from today, their venture seems risky.

Key for the fate of the CDM and the offset project origination industry will be the existence of alternative markets before, but also after 2020. In particular, the possibility to use some types of offsets post-2020 in the EU ETS will determine CER value in the final years to 2020. In our base case today, we assume that offsets will be banned from the EU ETS post-2020 (see below).

CER and ERU demand per market over 2008-2020 (Mt)

Source of use	2008-2012	2013-2020	Total
Industrial gas CER use from EU ETS	581	0	**581**
Phase III eligible CER use from EU ETS	9	719	**728**
ERU use from EU ETS	241	200	**441**
Industrial gas CER use from non-EU ETS	196	0	**196**
Phase III eligible CER use from non-EU ETS	0	200	**200**
ERU use from non-EU ETS	0	0	**0**
Total	**1027**	**1319**	**2146**

Source: orbeo

EU ETS market equilibrium and price forecasts

The EU ETS is long until 2020 if there is no set-aside or allowance retirement

Oversupply in 2020 is 879Mt in the base case scenario

When we combine all the above projections, we obtain a full view of the EU ETS supply-demand balances to 2020.

EU ETS balance forecast over Phase II and Phase III (Mt) – Scenario 2

Period	2008-2012	2013-2020	2008-2020
Emissions	10 176	18 380	28 556
EUA supply	10 662	17 024	27 685
CER/ERU imports	831	919	1 750
EU ETS excess (+) or shortfall (-)	**+1 317**	**-438**	**-879**

Source: orbeo

The EU ETS is long by 879Mt cumulated to 2020. The shortfall appearing in Phase III is not enough to absorb the massive oversupply stemming from Phase II.

Balances in the base case show a constantly long market

Below we show the yearly details of the balance evolution. The result is a very clear, and unsurprising, oversupply of the EU ETS to 2020 due to the combination of allowances and offsets. The Phase II excess will partly be absorbed in Phase III where volumes of distributed allowances are lower. However, this absorption will not be sufficient to remove the whole overhang. In cumulated terms the market remains long to 2020. Importantly, the peak in cumulated excess volumes happen not in 2012 (despite Phase II excess) but in 2015, as EU ETS-eligible offset issuance will continue high on its course until 2014 included, peaking for us in 2013 (at 338Mt that year).

Phase II and Phase III EUA volumes forecasts including Norway, new sectors and gases and aviation (Mt)

Year	Total 2008-2012	2013f	2014f	2015f	2016f	2017f	2018f	2019f	2020f	Total 2013-2020	Total 2008-2020
Expected emissions (a)	10 176	2 379	2 367	2 347	2 333	2 305	2 272	2 217	2 161	18 380	28 556
Free allowances (EUA) without aviation (b)	9 608	689	650	611	573	536	501	466	432	4 460	14 068
Auctioned allowances (c)	355	1 267	1 271	1 273	1 275	1 275	1 274	1 273	1 270	10 178	10 533
Allocated NER (included in NAP) (d)	399	0	0	0	0	0	0	0	0	0	399
Remaining NER (e)	88	96	95	93	91	89	88	86	84	721	809
Allocated Aviation allowances (f)	212	202	202	202	202	202	202	202	202	1 614	1 826
Special Reserve Aviation (g)	0	6	6	6	6	6	6	6	6	50	50
Compliance Demand (h)=(a)-(b)-(c)-(d)-(e)-(f)-(g)	-486	118	143	162	186	197	200	185	167	1 357	870
CER/ERU actual inflow (j)	831	300	300	300	19	0	0	0	0	919	1 750

EUA and CER excess (+) or shortfall (-) (j)=(i)-(h)	1 317	182	157	138	-167	-197	-200	-185	-167	-438	879
EUA and CER excess (cumulated)		1 480	1 656	1 794	1 627	1 431	1 230	1 046	879		

Source: orbeo

1.4 billion allowances in set-aside would have only short-term benefits

Obviously a mere set-aside of EUA will not change the above result as it is a transfer of distributed volumes across time, not a reduction in supply. In this case the set-aside of volumes in the initial years makes it possible to have a market at equilibrium (overhang absorbed) in 2017. After that, the oversupply comes back as the volumes are released back on the market. A 870Mt overhang is re-created in three years, and Phase III finishes about as long as Phase II. Hence the set-aside will only provide temporarily relief to an oversupplied market.

Phase II and Phase III EUA volumes forecasts including Norway, new sectors and gases and aviation (Mt)

Year	Total 2008-2012	2013f	2014f	2015f	2016f	2017f	2018f	2019f	2020f	Total 2013-2020	Total 2008-2020
Expected emissions (a)	10 176	2 379	2 367	2 347	2 333	2 305	2 272	2 217	2 161	18 380	28 556
Free allowances (EUA) without aviation (b)	9 608	689	650	611	573	536	501	466	432	4 460	14 068
Set-aside	0	-500	-500	-400	0	0	400	500	500	0	0
Auctioned allowances (c)	355	767	771	873	1 275	1 275	1 274	1 973	1 970	10 178	10 533
Allocated NER (included in NAP) (d)	399									0	399
Remaining NER (e)	88	96	95	93	91	89	88	86	84	721	809
Allocated Aviation allowances (f)	212	202	202	202	202	202	202	202	202	1 614	1 826
Special Reserve Aviation (g)	0	6	6	6	6	6	6	6	6	50	50
Compliance Demand (h)=(a)-(b)-(c)-(d)-(e)-(f)-(g)	-486	618	643	562	186	197	200	-515	-533	1 357	870
CER/ERU actual inflow (j)	831	300	300	300	19	0	0	0	0	919	1 750
EUA and CER excess (+) or shortfall (-) (j)=(i)-(h)	1 317	-318	-343	-262	-167	-197	200	315	333	-438	879
EUA and CER excess (cumulated)		999	656	394	227	31	230	546	879		

Source: orbeo

A withdrawal of the full 1.4 billion allowances would in practice correspond to the deepening of the 20% emission reduction objective the EC is so keen on. Such a much more drastic measure would make the market short after 2017.

Updated price forecasts: EUA prices will not rise above €15 /t before 2020

Below we update our price forecasts and detail the next quarters until 2013. We provide annual averages for the first-nearby contract for the following years until 2020. We differentiate two scenarios, our base case and one in which we propose a set-

aside of a significant volume of allowances early in Phase III, to be re-injected into the market over three years, from 2018 to 2020.

Price formation and dynamics over Phase III: offset prices are key for the EU ETS

The crux of our EU ETS price forecasts in the beginning of Phase III is offset prices, since offsets – but only offsets – are necessary to achieve compliance in the EU ETS in Phase III, as is clear from the equilibrium shown above. What matters is the speed at which the total surrendering cap which we estimate at 1,750 Mt will be met – since after that, the fate of CER and ERU prices will entirely depend on their acceptability post-2020. If they are not accepted, their oversupply as described above will weigh heavily and prices could rapidly fall to very low levels. If they are accepted post-2020 they will be transferred and the price fall will be less.

In any case there will be a price fall after the compliance cap of the EU ETS has been met as demand for offsets will shrink then, at least temporarily. Hence in any case, the dynamics of surrendering, in other words the pace of offsets issuances and purchase, will be key in determining their price path before 2020. This will in turn determine the overall price level of the EUA as the offsets will be the "marginal", i.e., price-making unit in the EU ETS.

One can understand in this light the actions of the European Commission on the CER subject: the EU ETS, like it or not, is dependent on the fate of CER, and signalling further restrictions to intake means deterring further project development, hence keeping higher CER prices, which is eventually favourable to higher EUA prices as long as only CER matter to achieve EU ETS compliance.

Things would of course be different if a shortage existed beyond the offset cap: in this case EUA prices will reflect the cost of domestic reductions in the EU ETS and CER will decouple from EUA prices – they can fall very low without the EU ETS regulators minding, as the spread between EUA and CER can widen without limit. Hence for us the EC has, for the sake of EUA prices, from now on an interest in signalling the acceptability of CER (some types at least) in Phase IV in order to hold their prices. Otherwise, the risk is that an early use of offsets for compliance will make EUA prices hold only thanks to their own bankability to Phase IV. On the contrary, if CER are transferable, their own price resilience will act as a support for EUA.

In the present context, we expect offset prices to fall quite low by 2020 as our hypothesis in the base case is that offsets will not be accepted any more in the EU ETS after 2020. About 900Mt offsets are needed in Phase III to achieve compliance in the EU ETS, as seen above. As also said above, this should about be provided by the CER coming from eligible projects already registered in Phase II (issuing in Phase III) and the ones banked from Phase II. On the whole, CER price path trajectory will be determined by the relative demand addressed to them, hence the surrendering pace. We expect surrendering to lead to meeting the 1750 Mt cap by 2016. After this date, offset prices should decrease, except if the regulation makes clear they can be kept for Phase IV. Otherwise prices will drift back below €5 /t. EUA will keep up above due to the existence of Phase IV, provided such a Phase is confirmed by the regulators and the market participants' consensus is that the likelihood of the existence of such a Phase is high. The absolute level of EUA prices will depend on the tightness of this new Phase. Our base case hypothesis is that EUA prices will settle around €15 /t at the end of Phase III but this could be more or less according to the shape of Phase IV – something quite difficult to anticipate now. Overall, after a period of relative tightness of the spread between offsets and EUA, prices should diverge again after 2016 as offset prices fall in the absence of post-2020 transferability (reminder: our assumption is that all offsets are banned from the EU ETS post-2020).

EUA prices in the base case are €11 /t - €13 /t before 2020, max in 2014-2015

In this scenario, we now see a very gradual increase in EUA prices across 2012, back to €10 /t at the end of the year, which represents a significant performance from present prices. We do not expect the recovery to start before March, once the last batch of Phase II allowances has been distributed. Prices should then continue moderately increasing in 2013, to reach €12 /t.

The rationale behind this "bullish" view is that we now stand at the trough in terms of market momentum, just before Phase III, when many companies have not yet started their purchase of Phase III units, while they have completed their Phase II compliance. We expect the market in the coming months, especially after the first semester, to witness increasing buyers' activity, thereby equilibrating the selling and buying pressures and lending some support to prices. In other words, we think that at present price levels the oversupply is fully priced in and we expect the likely future relative dynamics of the market to create more upside than downside.

For the following years to 2020, we expect prices to still increase a bit to €13 /t in 2014 and 2015, propped up by CER demand, then to consolidate back to €11/t once CER surrendering is over. Such a price level does not correspond to any fuel switching or other abatement needs in the EU ETS, but rather corresponds to a premium over CER, which in effect will set the marginal cost of compliance in the EU ETS.

EUA prices will then re-increase to €15 /t at the end of the period on an independent dynamic, as we assume, as said above, that there will be a fourth Phase and that transfer to Phase IV will support demand. The spread between offsets and EUA will widen at the end of the period (to a €12 /t difference). EUA will initially remain not too far above offsets as the cost of reduction in the EU will not have to be expressed in prices, but the offset oversupply and absence of demand will weigh on the price of CER at the end of the period while EUA will keep a higher option value thanks to Phase IV transferability.

As for CER, we see the differentiation between eligible and non-eligible CER happen eventually when Phase III CER become the market reference once the issued volumes cease being dominated by industrial gas CER. These are now being rushed in to comply by the May 2013 deadline. In 2013 eligible CER prices will recover towards €8 /t. Non-eligible CER prices will fall to near zero in the absence of any real demand after May 2013 while the last industrial gas projects run their course towards the end of their crediting period (180 Mt supply awaited between 2013 and 2016). In the beginning of Phase III and as long as issuances are needed to comply in the EU ETS, eligible CER will climb back to €10 /t. After 2015, however, we see them fall back, to €3 /t in 2020. The absence of any demand from the EU ETS after this date is the main reason behind the fall in value. Alternative markets as active or envisaged today (e.g., California, New Zealand) will fail to provide material demand, even for non-industrial gas CER.

We have not explicitly forecast ERU prices, owing to the higher regulatory uncertainty post-2012 (will it be possible to register new JI projects?) and post-2015, when ERU should cease to exist failing the creation of a new batch of AAU for the second commitment period of the Kyoto Protocol. In our view, the eligible ERU prices will remain close to Phase III CER until 2014, with a minimal discount due to the higher risk on this carbon currency. In 2015, if the end of the ERU is confirmed, they will fall rapidly close to zero.

EUA and CER first-nearby short-term price forecasts (€/tCO_2)

	2009	2010	2011	Q1 12f	Q2 12f	Q3 12f	Q4 12f	2012	Q1 13	Q2 13	Q3 13	Q4 13	2013
EUA	**13.3**	14.3	13.6	7.5	8.0	10.0	10.0	**8.9**	11	12	12	12	**11.8**
Phase III CER	**11.8**	12.5	10.4	4.0	5.0	5.0	6.0	**5.0**	8.0	8.0	9.0	9.0	**8.5**
Phase II CER									4.0	3.0	0	0	**1.8**

Source: orbeo

EUA and CER first-nearby medium-term price forecasts (€/tCO2)

	2013f	2014f	2015f	2016f	2017f	2018f	2019f	2020f
EUA	**11.8**	**13.0**	**13.0**	**12.0**	**11.0**	**12.0**	**13.0**	**15.0**
Phase III CER	**8.5**	**10.0**	**10.0**	**9.0**	**7.0**	**3.0**	**3.0**	**3.0**
Phase II CER	**1.8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Source: orbeo

Price path in the set-aside case: higher until 2016 (EUA at €15 /t), then collapse

In the "set-aside" scenario, the difference is that prices will initially be propped up by the transfer of allowance distribution to the end of the period. As we think the measure could be voted in Q2 12, we have changed our price forecasts in this alternative scenario from Q3 12 to reflect the higher tightness priced in by market participants. The first impact is that offset prices are higher as the missing EUA volumes will primarily mean higher demand for offsets for compliance (let us not forget that, overall, compliance will be achieved through offsets).

This will mean quicker absorption of the oversupply through the accelerated use for compliance of the volumes banked from Phase II. Even then, the Phase II excess is such that it is enough to compensate for lower EUA distribution. In other words, we do not witness a market, even for a single year, in which offsets are not sufficient to balance the market, and abatement is needed in the EU ETS perimeter. This would be theoretically possible as the instant issuance capacity of offsets has its limits. However the total oversupply in the base case scenario peaks at 1,794Mt in 2015. It is thus logical that a 1.4bn EUA set-aside is not enough to make the market short at any time.

At the end of the period, the opposite phenomenon happens, and the additional supply of EUA weighs on prices. Under our hypotheses for the scheduling of the set-aside and then the release of volumes, the market reaches a low point of cumulated oversupply in 2017. At this date, the market is almost balanced, before the released volumes kick in and put it back in oversupply for the end of the Phase.

In terms of price levels, we should observe a jump in the second part of 2012, as the measure is priced in by the market. We see €12 /t for first-nearby EUA then (instead of €10 /t in the base case). We have upped our 2013 forecast by €2 /t, to €13.8 /t on average. In this scenario, prices of offsets will move much closer to re-investment costs as the market will be temporarily balanced. For the same reason, the spread between price-making CER (as the marginal compliance unit) and EUA will be narrower in the first years of Phase III, since the relative demand for CER will be higher. Some might argue that in periods when the system has been tighter, historically, the spread between EUA and CER has moved wider. EUA as the most liquid traded underlying generally reflected the tightness in a more reactive way than more inert CER. This might be true in terms of market dynamics (impact of speculation in particular) but, from an economic value (i.e., fundamental) standpoint, we want to reflect in our forecasts that CER will be in relatively higher demand than EUA.

As domestic abatement will never be needed, EUA prices will never have to rise above CER cost plus a risk premium. As a result, we expect EUA prices of €15 /t in 2016, and eligible CER prices of €10 /t then. CER prices will have peaked at €12 /t one year earlier. In 2016, when the surrendering cap is met, their price is already lower on average as their intrinsic value falls from this year if no further CER import cap is created for Phase IV. When the set-aside volumes are put back on the market, EUA prices fall back as the 860Mt excess is built back again in a matter of three years. Out of the 1,400Mt sold back (we assume they will be auctioned for the most part), only 540Mt are needed and the rest is directly transferred to Phase IV.

We show as a result EUA prices back towards €10 /t – but they could be anywhere really since it will all depend on Phase IV tightness at this stage. If Phase IV is made really tight, prices could for example remain higher, e.g., at €12 /t, but in all probability they will be below 2016 levels.

EUA and CER first-nearby short-term price forecasts (€/tCO2)

	2009	2010	2011	Q1 12f	Q2 12f	Q3 12f	Q4 12f	2012	Q1 13	Q2 13	Q3 13	Q4 13	2013
EUA	**13.3**	14.3	13.6	7.5	8	12	12	**9.9**	13	14	14	14	**13.8**
Phase III CER	**11.8**	12.5	10.4	4.0	5.0	8.0	9.0	**6.5**	10	10	11	11	**10.5**
Phase II CER									4	3	0	0	**1.8**

Source: orbeo

EUA and CER first-nearby medium-term price forecasts (€/tCO2)

	2013f	2014f	2015f	2016f	2017f	2018f	2019f	2020f
EUA	**13.8**	**13.0**	**14.0**	**15.0**	**13.0**	**12.0**	**10.0**	**10.0**
Phase III CER	**10.5**	**10.0**	**12.0**	**10.0**	**3.0**	**3.0**	**3.0**	**3.0**
Phase II CER	**1.8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Source: orbeo

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