



Climate  
Strategies

## Strengthening The EU ETS

Creating a stable platform for  
EU energy sector investment

**FULL REPORT**

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Climate Strategies is an international organisation that convenes networks of leading academic experts around specific climate change policy challenges. From this it offers rigorous, independent research to governments and the full range of stakeholders, in Europe and beyond. We provide a bridge between research and international policy challenges. Our aim is to help government decision makers manage the complexities both of assessing the options, and of securing stakeholder and public consensus around them. Our reports and publications have a record of major impact with policy-makers and business.

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## EXECUTIVE SUMMARY

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Europe faces the intertwined issues of debt, recession and economic uncertainty. These issues also impact its climate and energy policy, and in particular the EU Emissions Trading System (EU ETS). However, improvement to the EU ETS could enhance European prospects for economic stabilisation, investment and recovery.

This report, *Strengthening the EU ETS*, analyses the underlying issues affecting the EU ETS, and sets out the main response options. The core conclusion is that no individual measure adequately addresses the combined needs: to restore confidence, to stabilise expectations, and to provide a strategic context for huge investment in the EU energy sector. A combination of measures would best meet Europe's needs:

- a. Set-aside of allowances to 'recalibrate' the EU ETS,
- b. A rising reserve price on future auctions, or similar mechanisms that establish a de-facto 'floor price', to restore confidence in its robustness for the purposes of investment and financial stability, and
- c. Accelerated negotiations on post 2020 strategies and commitments.

### Context: need and rationales

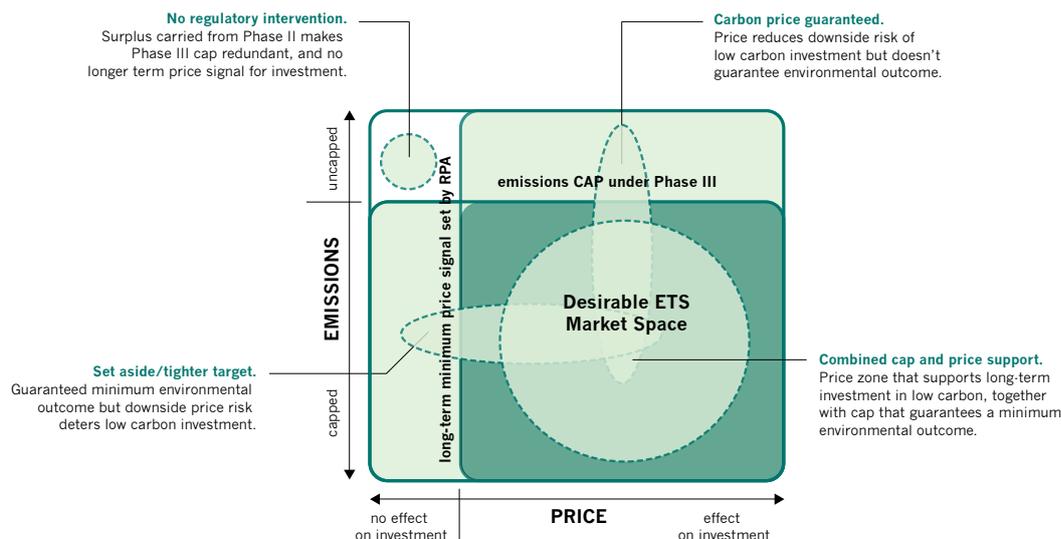
Europe needs a new generation of energy investment, up to €1,000bn in its energy system over the coming decade, and much improved energy efficiency. The EU ETS was expected to provide a rising carbon price to help drive investment in both energy infrastructure and energy efficiency. With the move to auctioning from next year, the EU ETS was also projected to raise €150-200bn in public revenues over Phase III (2013-20). The expectation was that these revenues would be divided between the needs of general public finance, the specific needs for new energy infrastructure, and climate finance including international commitments.

However, the combined impacts of recession, response to the carbon price in 2008-11, and complementary measures, have led to a surplus of emission allowances that will last out to 2020. As a result, EU ETS allowance prices have collapsed. This undermines the EU ETS's value as a driver of either emission reductions or investment. At a time of economic uncertainty and fiscal crisis, EU energy-related industries have lost orientation for investment, and governments have lost an expected €100bn of auction revenue.

Action is needed. The EU is developing strategic roadmaps which require investment of many hundreds of billions of Euros in long-lived energy assets. Such investment must meet Europe's needs for long term energy and climate security, and would also serve macroeconomic goals. However, it is not consistent or credible to expect such investment whilst allowing the carbon price – a price that is ultimately an output of political decisions – to languish well below €10/tCO<sub>2</sub> for several years, instead of the €25 to €40/tCO<sub>2</sub> projected when the EU ETS Phase III Directive was adopted. Industry responds more to what it sees in markets than what it is told about the future, but the massive dichotomy raises the cost and risks of all energy sector investment. The present situation serves neither Europe's economic or environmental interests.

Action is justified. The original policy setting for Phase III of the EU ETS was inconsistent: delivery of multiple goals (including renewables and energy efficiency), and emission offsets, together would anyway have led to an inadequate ETS outcome without a stronger target. This inconsistency was partly justified by the expectation of moving to 30% upon a global deal. While international action on emissions abatement continues to develop, it is unlikely to deliver clarity in a useful timeframe: at the same time, the scale and duration of the European recession – a plausible *force majeure* on its own – has weakened the outlook so much that a surplus of emission allowances is now projected to last past 2020.

**Figure ES-1:** Price and Quantity in the EU ETS



## The options

Concerns around the EU ETS are not just about the price or quantity of allowances, but also about the credibility of and expectations for future emissions prices. Price and quantity in emissions trading schemes serve different, and potentially complementary, roles over both the short term and longer term (Figure ES-1). Addressing these quantity and price issues requires remedies that are strategic as well as tactical, complementary and not piecemeal.

This report outlines the needs and prospects for longer term clarity, but this cannot on its own address the current situation. For more immediate action we analyse five options summarised in Table ES-1, reflecting different degrees of ambition, effectiveness, timescale, and procedural and political feasibility.

## Quantity measures

Earlier studies by Climate Strategies suggested that revisions to the overall 2020 target, involving all sectors and with a complex political history, would make most sense in the context of clarifying longer-term strategy towards 2030. Such targets serve international as well as domestic purposes, and may be linked to the international post-Durban negotiations. But achieving EU ETS price impacts through this approach would require both changing the EU ETS cap and amending the Directive: these actions would be problematic as a near-term response.

Tightening the EU ETS cap trajectory on its own would, by implication, require consensus on changing the long-term default trajectory, and would similarly require revision to the Directive. It would risk conflating this strategic decision with a fix to 'mop up' the current surplus over time, hence also making it quite uncertain how the current price would actually respond.

The immediate solution being politically considered is the set-aside of emission allowances, so as to reduce the current supply of allowances and therefore boost the price. This avoids many of the problems of the above options, and has strong justification. Set-aside is necessary because the extent of oversupply to 2020 makes the system wildly out of balance from either its intended role or strategic needs.

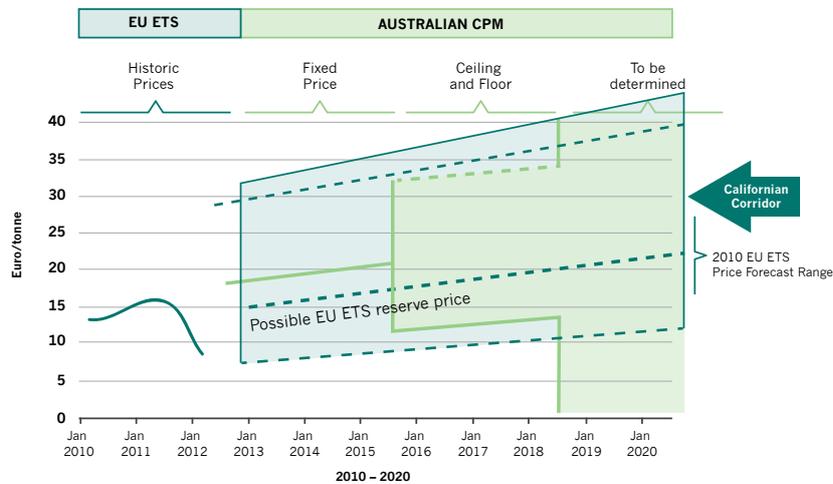
Set-aside could aim to restore the EU ETS to approximately the balance intended at the time of adopting the Phase III rules, a 'recalibration' to take account of the factors noted. If 1,400MtCO<sub>2</sub> were set aside (the level initially proposed in the EU Parliament) and not returned within Phase III, central estimates suggest the price might rise towards €20/tCO<sub>2</sub>. If so, corresponding revenues across Europe would rise above €20bn/y, including around €1bn/y in Greece, and €2bn/y in Spain and Italy, for example.

Yet on its own, set-aside would not adequately resolve the problems of deep uncertainty, or address the strategic needs. The uncertainties which stalk the European economy and energy system impact both energy demand and supply mix. If the 1,400MtCO<sub>2</sub> suggested were set aside and not returned within Phase III,<sup>1</sup> and any subsequent adjustment was precluded, a simple 'stress test' suggests that Phase III price developments could still range widely: from below €10/tCO<sub>2</sub> to above €30/tCO<sub>2</sub>.

The ETS was established to deliver environmental goals efficiently, at a reasonable balance of cost and environmental ambition, and to support low carbon investment. Supplementary roles include finance and contributions to the international efforts. For the EU ETS to fulfil these objectives, set-aside is necessary, but on its own is insufficient.

**Figure ES-2: EU ETS Prices compared against Australian and Californian ETS price corridors**

The Figure illustrates trend of EU ETS prices since 2010, compared to the fixed price followed by price corridor in the Australian CPM, and the wider price corridor defined in the Californian ETS.



## Price-related measures

The move to auctioning in Phase III introduces an important option which did not previously exist. Negotiating a rising reserve price on future ETS auctions would establish a de-facto floor price for the EU ETS, demonstrably reducing the downside risk for investors and helping to attract badly-needed capital to the energy sector. Some other approaches could perform a similar role, but a reserve price would make explicit the implicit judgement signalled by all intervention, about what constitutes a ‘too low’ price.

Economics research has increasingly emphasised the value of ‘hybrid’ instruments which combine price and quantity features. This reflects explicitly that all environmental policy in reality is a balance of economic and environmental objectives, embedded in uncertainty. Floor prices are a feature in the US State and Australian cap-and-trade systems, and the EU ETS is now alone in not having such a mechanism (Figure ES-2).

A Reserve Price for Auctions (RPA) on its own would not, however, be appropriate, as:

- the current scale of oversupply would then eclipse any purchase from auctions for several years – removing any revenue benefits; and
- the ‘reserve price’ would in fact then just define the price, removing the responsiveness of trading and undermining the strategic value of quantity goals.

An RPA is not a substitute for adequate targets or (in the current circumstances) set-aside. Rather, it provides automatic insurance if the level of set-aside proves inadequate in the face of other economic and policy developments. It would reinforce the system by removing – by design – the scale of downside risk that

low carbon investors perceive from the the EU ETS to date. It could set in place an enduring alternative to repeated interventions in the face of uncertainty.

The legal and political scope for such a measure in Phase III remains to be determined; the legal issues appear to be similar to those for set-aside itself. An indicative reserve price beyond 2020, for Phase IV of the EU ETS, could help to stabilise prospects and also provide a clearer framework for negotiations on Phase IV and 2030 goals. A rising trend in reserve prices would send an unambiguous strategic signal.

In the absence of an appropriate EU policy response, some Member States are likely to ‘go it alone’ in a bid to stabilise their investment climate, as the UK has already done with a national carbon floor price defined through adjustments to domestic taxation. This is a ‘double-edged sword’. A coalition of countries taking such measures could establish the principle. Yet, it introduces competitiveness concerns within the single market and could undermine the achievement of a single harmonised EU carbon price through the EU ETS, with fragmentation also at odds the intent of the Third Energy Package. Such an outcome would clearly not be in the long-term interests of the EU, its industry, or the environment. However, given the need for investment, such national responses may be better than a continued vacuum in EU responses.

**Table ES-1:** The five individual interventions assessed against ETS objectives and deliverability.<sup>1</sup>

		Tighter GHG Target	Accelerated ETS Trajectory	Set-Aside	Reserve Price Auction <sup>4</sup>	National price floors and contracts
<b>Primary Objectives</b>	Efficient near-term emissions reductions <sup>3</sup>	Partial	Partial	Yes	Yes	Limited
	Efficient Investment: price stability and certainty	No – but improved if/when post 2020 clarity	No – but improved if/when post 2020 clarity	Depends on clarity of rationales and market reactions	Yes, if level adequate to ameliorate downside risk	Partial – fallback option if no EU-level action
<b>Secondary Objectives</b>	Contribution to EU position in international climate negotiations	Yes	Yes (through higher price and long-run commitment)	Indirectly through increase	Indirectly, and greater predictability might help	No, not an EU position and would reduce ETS prices
	Revenue	Increase depends on level of target and split with ETS cap	Increase depends on level of cap	Less than corresponding cap change (free allocations preserved but price uncertainty)	Similar to corresponding set-aside but much less downside risk	Could increase revenue for countries involved and avoids 12% revenue recycling to Eastern Europe
<b>Delivery</b>	Political possibilities	Varied national positions; effort to move to 25% in 2011 was blocked	Similar to politics of GHG target	Leading proposal from the EU Parliament	May be tensions over clearer fiscal implications	UK introducing price floor and contracts
	Legal possibilities	Any subsidiary change to ETS cap would require amended Directive	Would require amending number in Directive	Probably possible through Comitology, probably would need to release set-aside by 2020	Probably possible without new legislation on similar basis to set-aside	Does not involve EU legislation
	Timing	Past rejection may impede; likely linked with international negotiations	Unclear, but slowed by the long run implications and need for amendment	Fastest option – already in active consideration	Decision in principle could be fast; setting level likely to take longer	Can be fast through national legislation, though implementation is complex

<sup>1</sup> A likely interpretation of the EU ETS Directive is that decisions on timing of emission allowances released through auctions can be made through Committee procedures (not requiring any revisions to the Directive), but that all allowances should be made available by the end of the period. However, if the intent were there, it would be easy to adjust the cap yet to be negotiated for Phase IV so as to absorb any ‘intended’ degree of banked allowances associated with set-aside.

<sup>2</sup> Note the core finding that no individual instrument offers an adequate response: along with accelerated efforts to clarify post 2020 frameworks, a combination of two measures would be required to first ‘recalibrate’ (through set-aside) and then restore confidence in an adequate degree of stability to support investment.

<sup>3</sup> The impact of measures on emissions obviously depends on the strength of the intervention. Tighter 2020 target and lowered ETS trajectory are indicated as “partial” because, with a focus towards 2020, they would not promptly address the current surplus and the analysis of Neuhoff et al (2012) suggests that the scale of this surplus creates a market driven by financial rather than industrial banking, with much higher discount rates. Set-aside would address this promptly, RPAs may do so depending on levels and how the terms are specified.

<sup>4</sup> The report analyses Reserve Price Actions as the simplest mechanism for automatically adjusting quantities in the market to restore price, if a growing surplus leads to price collapse (which is the historical pattern). The text notes there are also other, less direct, option to achieve similar goals.

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## Strategic processes: beyond 2020

Major energy-related investments, particularly in infrastructure, need a vision and framework beyond 2020. Negotiations towards 2030 commitments, building on the EU Roadmap processes, are urgently required. They need to start and develop as soon as possible, but involve more than just a focus on 2030 targets and/or the EU ETS cap trajectory.

Roadmaps will be required not just for energy, but for all the main sectors covered by the EU ETS. A comprehensive view will need to integrate these including the impact of complementary measures, investment trends, concerns about carbon leakage, infrastructure and innovation needs.

Longer term targets need to be built upon these foundations. The sheer scale, scope and importance of such commitments means that they are likely to take a long time to resolve, and may be linked also with the 2015 target deadline for global negotiations under the Durban platform. Balance is required: trying to rush a comprehensive post-2020 commitment as a solution to the current market price risks repeating past errors.

A comprehensive adequate agreement may take a long time to reach and with an 8-18 year time horizon from today may be heavily discounted in the current market. Negotiations towards 2030 are essential, and could clarify the needs of strategic investors in key sectors, but cannot sensibly 'fix the current price'.

## Conclusions

Alongside the processes for Roadmaps and post-2020 negotiations, the present opportunity lies in how Europe handles the evident need to strengthen the EU ETS, in terms of the both quantity recalibration and price confidence. A triad of measures are required to meet three distinct needs:

- Set-aside to restore the ETS price (and auction revenues) to meaningful levels, and restore confidence that EU policy will provide market signals that are consistent with science, international and strategic processes.
- Rising Reserve Price Auctions or other measures to cap downside risks for investors and to stabilise minimum auction revenue expectations in the face of deep uncertainties; these would also reduce tensions between the ETS and complementary measures, and preclude the prospect of ongoing interventions through further set-aside.
- Negotiations towards 2030 goals, initially based around sector specific needs and building up to a comprehensive agreement on 2030 commitments, set in the realities of both domestic possibilities and international developments.

The three measures address different needs and are mutually reinforcing. Anything less risks leaving the EU ETS, and European industry and its economy, struggling with the consequences for many years to come.



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## Introduction

The EU, and in particular the Eurozone, is facing enormous and enduring economic challenges. These challenges have understandably reduced the attention and priority given to climate change, which in turn has contributed to serious problems in the EU's current climate policy.

Most notably, Europe has expended huge political capital to establish and strengthen the European Union Emissions Trading Scheme, which sets an EU-wide price on emissions. When key decisions were taken for Phase III, out to 2020, prices were projected to rise to about €40/tCO<sub>2</sub>: they have recently fallen below €7/tCO<sub>2</sub>.

The recession has been a major factor reducing carbon prices; however, this report shows that it is far from the only one. The link between climate and economic challenges works both ways: macroeconomic trends affect the EU ETS, while the EU ETS itself has macroeconomic dimensions:

- Europe needs a massive new generation of investment in its energy sector, yet the uncertainties in the macroeconomic environment and the instability of the carbon price combine to deter investment precisely at a time when the European economy needs substantial inward investment to help generate growth and jobs.
- European governments need revenue, yet the collapse in allowance prices has reduced expected revenues from EU ETS auctions by the order of €100bn to 2020.

These economic issues cannot be resolved by ignoring climate change. The Stern Review (Stern 2006) showed the real and costly risks associated with not reducing emissions fast enough, and so having to deal with the consequences of major climatic change. Using energy more efficiently will deliver immediate economic advantages, including construction sector employment through retrofitting programmes. Expanding new energy sectors such as renewables has the potential to deliver economic advantages over the mid and longer term.

The EU has, rightly, set itself a demanding long-term climate change goal: to reduce greenhouse gas (GHG) emissions by 80-95% by 2050. The Commission has published 'roadmaps' for how this could be done. A clear policy framework for low-carbon transformation is needed, to create an attractive environment for investment and innovation in Europe's energy sector, which can strengthen its role in a changing global economy.

The EU ETS has been strengthened since its introduction in 2005. But weaknesses remain, as revealed starkly by the present situation. This study examines options for strengthening European climate policy, and in particular the EU ETS, in context of wider challenges. Climate policy defined purely in terms of reducing emissions is no longer sufficient. It must be seen to do so efficiently, effectively, pragmatically and in line with the EU's other strategic challenges. This report explores how this can be achieved.

**Part I** outlines the main objectives of European climate policy and the EU ETS, explains the current situation and considers the extent to which this meets the key objectives.

**Part II** then considers options for strengthening the EU ETS, grouped into the two main types:

### *Reducing the quantity of allowances*

- Tightening the 2020 GHG reduction target, and/or adopting a 2030 target
- Lowering the ETS cap and tightening the 1.74% annual reduction trajectory
- Setting aside phase III allowances

### *Ensuring a minimum price*

- Setting a Reserve Price on the EU ETS Auctions (RPA), or other 'auto-adjustment' approaches
- National measures
- Other measures

**Part III** examines the possible relationship and interplay between different options, recognising that EU climate policy, like any other policy area, needs to learn and evolve.

# PART 1: EU ETS OBJECTIVES AND EVOLUTION

Figure 1: EU Allowance (EUA, upper) and CDM certificate (CER, lower) prices over Phase 2 (Jan 2008-Feb 2012)



Source: Point Carbon 2012

## Putting a cap on price and carbon

The EU ETS aims to control emissions from both power generation, district heating (above a certain size) and a number of energy intensive industries. It covers over 11,500 installations across 30 countries (the EU plus Norway, Lichtenstein & Iceland). Emissions from these installations account for over 40% of total emissions in these countries.

The underlying theory is well developed, that establishing a cap on emissions combined with a market in trading emission allowances will establish a carbon price that settles at the lowest possible level given the overall cap, and thus allow the greatest emission reductions at least cost. Industry has total flexibility over how best to deliver the cap. An important element is that the EU ETS was designed for sequential phases, and the theory was that allowing banking of allowances between phases (from Phase II onwards) would help to stabilize the price and provide a longer perspective for investment.

Phase I of the ETS, from 2005 to 2007, was explicitly a learning phase, without such banking; after a year of prices close to €30/tCO<sub>2</sub>, the price collapsed as it became evident that there was a large surplus of allowances in the market. Against this experience, the Commission acted to strengthen many of the National Allocation Plans submitted for Phase II, thus creating an expectation of a better balance between supply and demand. Also, it was assumed that banking between Phases II and III (2013-2020) would help to stabilise the price. Prices reached a peak of over €30/tCO<sub>2</sub> in July 2008, fell to around €15/tCO<sub>2</sub> in 2009.

The major decisions on Europe's 2020 goals, and the design of ETS Phase III taken in 2008-9, appeared to stabilise the system. The Commission's 2009 analysis estimated that the decision would imply carbon prices rising close to €40/tCO<sub>2</sub> by 2020, and independent studies expressed a wide range around this. Some of these studies expressed continuing concern about the potential for long-term surplus if the EU delivered on its combined goals of additional energy efficiency and a significant expansion of renewable energy generation, combined with the potential scale of international credits (see next section). In practice, prices stabilized around €15/tCO<sub>2</sub> for over two years (Figure 1).

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In late 2011 allowance prices began to fall again: the price reached €7/tCO<sub>2</sub> in mid-December 2011, with an average of €9/tCO<sub>2</sub> during the last quarter of 2011. It is now clear there is large surplus from Phase II that will be banked forward into Phase III, with an overall surplus projected to continue out to 2020 (as illustrated in the next section). Prices in 2012 (to date) have broadly fluctuated in response to perceptions about the political willingness of the EU to intervene.

To address various problems identified in Phases I and II, proposals were put forward for Phase III to include a centralised cap, with the majority of allowances auctioned (mainly to the power sector, which accounts for well over half the total emissions covered by the ETS). These proposals were formally adopted in the revised EU ETS Directive adopted in December 2009. The EU ETS cap was set so that emissions from EU ETS sectors would be 21% lower in 2020 than in 2005, with the cap declining 1.74% every year 2013-20; this trajectory would continue each year after 2020 unless altered by a further change to the Directive. Various other provisions addressed revenue recycling, differentiation between EU-15 and the new Member States, and principles around treatment of sectors 'at risk of carbon leakage'.<sup>2</sup>

The major frameworks around centralized target-setting and carbon leakage in Phase III of the EU ETS are established. As the EU enters the last year of Phase II, and against a backdrop of continued uncertainty in the wider economy, the obvious need is to assess whether the EU ETS is delivering its objectives, and what issues need to be reassessed as the EU moves towards the eight-year period of Phase III of the EU ETS.

## ETS objectives

The EU ETS is the primary instrument for reducing emissions in European energy and related industries, and helping to deliver the EU's international commitments. To achieve this, it embodies more specific primary and secondary objectives:

The primary objectives of the EU ETS can be characterised as:

- i.** To reduce GHG emissions efficiently, at a negotiated balance of cost and environmental gain;
- ii.** To promote low carbon corporate investment, by providing a price signal that enhances the economic viability of energy efficiency, renewable energy and other low-carbon energy sources, as cost-effectively as possible.

The secondary objectives of the EU ETS include:

- iii.** To contribute to the EU's international commitments in assisting developing countries (e.g. through the Clean Development Mechanism (CDM));
- iv.** To raise revenue, some of which could be used to support low carbon innovation and/or energy efficiency programmes.

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<sup>2</sup> In the EU-15 (member states which joined before 2004), all allowances for some sectors, notably the power sector, will be auctioned in Phase III. Twelve per cent of the total auction revenue will be given to EU-12 countries (member states which joined in 2004 or 2007) whose emissions are lower than required by their Kyoto targets. EU-12 states are permitted to continue giving free allowances to power generators, though the free allocations must be phased out during Phase III. So, for example, the Polish government plans to give 70% of allowances free to 188 power installations from 2013. Fifty of these are new plants. This would constitute a total of 78 million tonnes of CO<sub>2</sub>, declining to 32.3 million tonnes in 2019 and zero in 2020.

Sectors are considered to be at risk of carbon leakage if they are energy intensive and highly traded. These sectors will continue to receive allowances free, though at a declining rate. The number of free allowances will be set against a benchmark, taking account of the best performing (in emissions terms) companies in that sector. The number of free allowances will decrease over time. The sectors currently classified as being at risk include aluminium, cement, chemicals, iron and steel. This will help energy intensive companies with high on-site emissions, for example due to fuel used to provide heat. But it will not help companies that are electricity-intensive, because such off-site emissions are not covered by free allowances.

## i) Reducing GHG emissions

There is evidence that the EU ETS has contributed to GHG emission reductions in Europe since 2005, particularly through fuel switching in the power sector and some industrial process improvements (most notably in cement). Other factors have also contributed, including reduced economic activity (recessionary effects), the impact of energy efficiency standards and targets, and the promotion of additional renewable energy generation.

As a result, the balance between cost and environmental gain is now very different to that envisaged just a few years ago. The cost of achieving the Phase II emissions target, and also the 2020 targets originally agreed in March 2008, is now much lower than expected (as emphasized in recent Commission documents). Moreover, the EU and most Member States have adopted a wide range of additional measures that seek to address at least two other generic dimensions of climate and energy policy:

- Removing barriers and other ways of improving energy efficiency, which carries multiple benefits. There is long-standing evidence of numerous market failures, and even in business sectors (most relevant to the EU ETS) surveys suggest that most companies are motivated to make energy savings only where there is a short pay-back period (typically two or three years) (Martin et al, 2011). Enhancing energy efficiency is thus a priority target for climate and energy policy.
- Policy around infrastructure and innovation required to support a low carbon economy. These range from planning decisions to public funding of infrastructure (e.g. rail and power transmission) and the EU's Strategic Energy Technology Plan.

The crucial role of such complementary measures has become clearer over time: they assume an even greater significance in times of economic difficulty, and when carbon prices (or expectations for long-term rising prices) are low. An important issue is therefore how the different instruments interact. Debate over the Energy Efficiency Directive has highlighted tensions arising from the concern that improving energy efficiency (indeed, all specific near-term measures that reduce energy use) may not actually reduce EU emissions, but instead reduce the allowance price faced by everyone in the system.

The ETS has cut emissions, by amounts variously estimated to be in the range 30-70 MtCO<sub>2</sub>/y average to date, and will continue to do so to some degree.<sup>3</sup> However, the clear original intent and expectation was that the cap would be binding, accelerating emission reductions and driving a significant carbon price. This is no longer the case.

## ii) Low carbon investment

A crucial issue is the extent to which the EU ETS fosters low carbon investment. New renewable energy capacity is a significant component of this investment, and the EU has adopted the binding renewables Directive to promote renewables.

Some renewable energy schemes (e.g. onshore wind, biomass) are only marginally more expensive than new coal or gas plants, so a low carbon price may be enough to attract investment into these schemes. However, a low carbon price may not be sufficient to make new renewable capacity economically preferable to existing fossil fuel plant, where the capital investment has already been made and only the energy cost is relevant. Other renewable sources, notably offshore wind and solar PV, are significantly more expensive.

The investment issue is central because Europe has huge investment needs in the energy sector, potentially on the order of €1,000bn over this decade.<sup>4</sup> The EU Energy Roadmap notes that “the EU’s energy system needs high levels of investment even in the absence of ambitious decarbonisation efforts... scenarios indicate that modernizing the energy system will bring high levels of investment into the European economy.”

In practice, the EU ETS has so far provided little clarity for investment decision making. Low allowance prices, combined with periodic instability, mean that the EU ETS has had limited impact on low-carbon investment.<sup>5</sup> With reference to both energy and carbon prices, the EU Energy Roadmap notes that “the current uncertainty in the market increases the cost of capital for low-carbon investment.”

Given the huge need for increased investment, at a time when EU governments have significant budget constraints, a crucial criteria for European climate policy will be its ability to attract large scale private investment. This is also a challenge for European policy overall. An important question will thus be whether EU climate policy can help to stabilize investor expectations so as to attract energy sector investment. If it can, it has a good chance not only of delivering European emissions reductions, but also supporting investment in the European energy sector, and through this the wider economy.

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### iii) Supporting international commitments

In terms of the secondary objectives, the ability of organisations to surrender Certified Emissions Reductions generated under the CDM (instead of EU ETS allowances) has generated significant international trading volumes in CDM emissions certificates. This has been beneficial for low carbon investments receiving CDM revenues but, as with 'complementary measures', CDM offset projects reduce demand for EU ETS allowances and so lower their price.

The design for Phase III already substantially restricts the role of the CDM, partly due to earlier fears that large volumes of credits would undermine the EU ETS price. EU ETS prices have declined anyway, and are now at such low levels that the practical financial support for low carbon investment in developing countries at the present price is negligible. Prices for CDM credits have sunk below €5/tCO<sub>2</sub>, a level that does not provide significant support to most emission reducing investments (see Part 3 below).

### iv) Revenue generation

The potential for revenue generation from auctioning was not a major part of early ETS discussions, but has become increasingly relevant. Little revenue has been raised for European governments to-date, mainly because of the high level of free allocation in Phases I and II of the scheme. However, the revenue implications of the EU ETS become much more relevant in Phase III given the move to auctioning, particularly in the power sector.

The EU ETS Directive states that member-states should spend at least half of the auction revenues from the scheme on low carbon innovation and climate change adaptation. Some of the anticipated future revenue has been allocated to European programmes, notably the New Entrants Reserve 300 (NER 300), under which the revenue from 300 million allowances will be spent on new renewables and Carbon Capture and Storage. The proportion of total EU ETS revenue allocated to low-carbon investment through the NER 300 scheme is only a few percent of total revenue; most of the revenue will be available to governments for other spending, including deficit or tax reduction. Apart from this, European institutions have little real influence over how auction revenue is spent. Yet, as indicated above, Europe requires major energy-related investment in the years and decades to come.

To understand the prospects for the EU ETS in its present form fulfilling these various roles, we first need to understand the evolution of the ETS price and influences upon it.

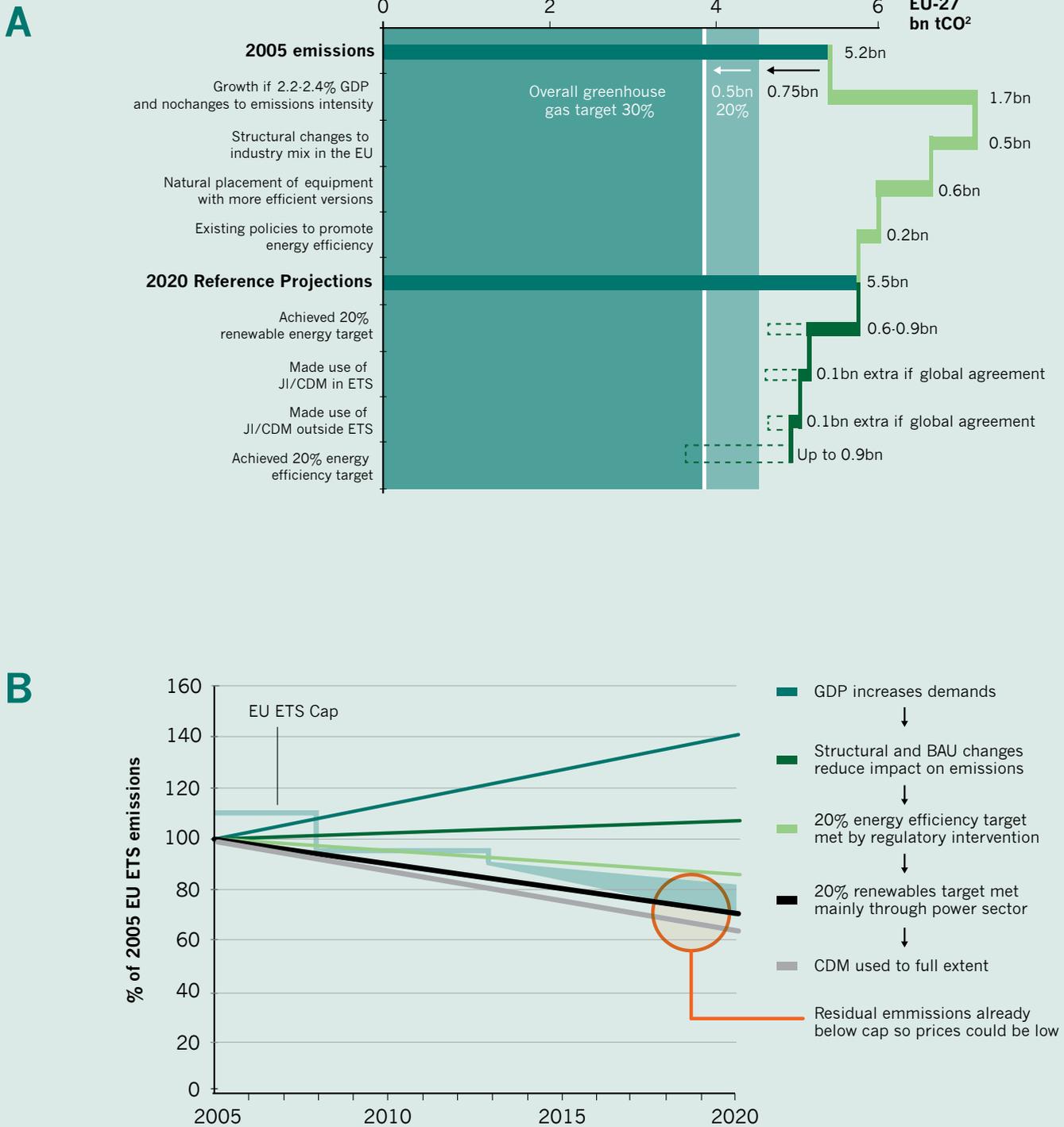
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<sup>3</sup> Despite 'with hindsight' surplus, the ETS has cut emissions because it has had a positive price (and also affected perceptions), irrespective of realized surplus. It is intrinsically complex to estimate the actual degree to which the EU ETS itself has cut emissions, as it requires some way of constructing what might have happened without it. A review of published estimates suggests average savings since its establishment in the range 30-70MtCO<sub>2</sub>/y, roughly 2-4% of the total emissions covered (Source: M.Grubb, T.Laing, M.Sato & C.Comberti, Analyses of the effectiveness of trading in EU-ETS. Climate Strategies, forthcoming (2012)).

<sup>4</sup> The most widely cited estimate for the UK electricity and gas sectors alone is around €200bn to 2020 (Ofgem 2009; HMG Energy White Paper on Energy Market Reform, 2011). The EU Energy Roadmap refers to the need for a new generation of investment but does not itself appear to give projections.

<sup>5</sup> The *level* of price required to help drive lower carbon investments of course varies with sector and technology. For example in the manufacturing sector, Martin et al (2011) conducted a survey of almost 800 manufacturing companies across six European countries. The interviews revealed that allowance prices would be highly relevant to investment decisions at prices in the region of €40/tCO<sub>2</sub>. Obviously, it is not 'all or nothing', but this does indicate that a price of €10/tCO<sub>2</sub> or lower will mean that the ETS has little impact on investment decisions, and might also lead to wider lack of confidence in EU climate policies. However, the interviews and the broader study emphasised that many factors influence investment beyond price alone, most notably the strategic credibility and predictability of the policy framework.

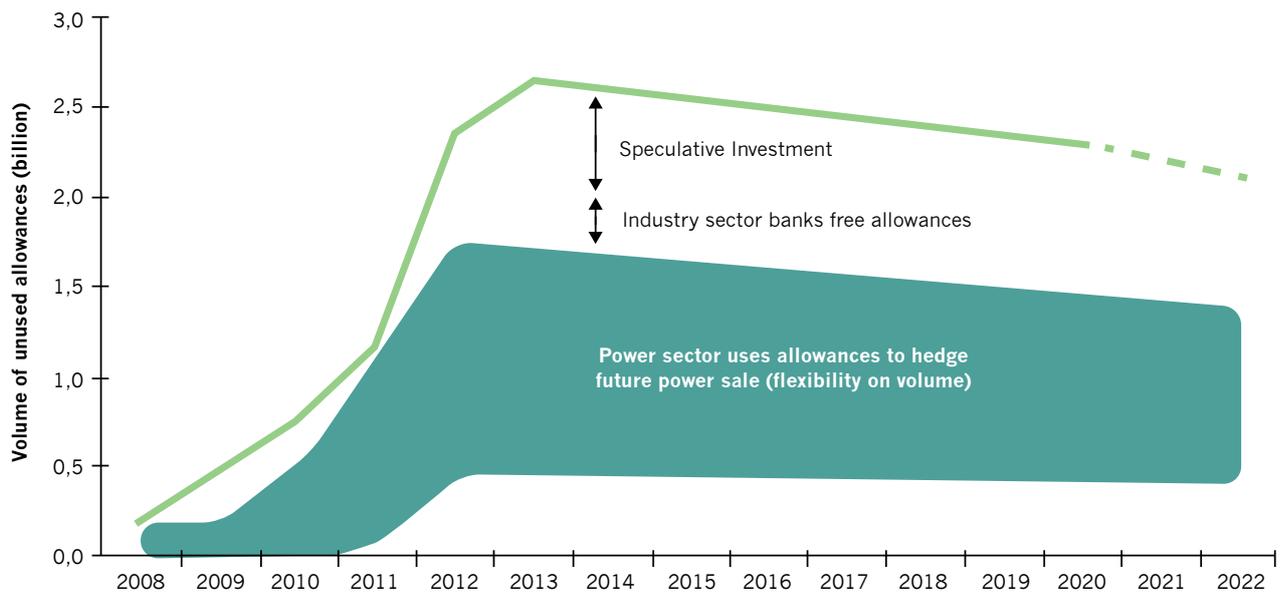
**Figure 2:** Influences on demand for EU ETS *before* recessionary impacts



Note: Figure 2a shows the impact of various factors upon total EU emissions in 2020 as projected in a 2009 report. This underlines the impact of many factors, including the large influence of assumptions around economic growth, structural change, capital stock turnover, as well as ‘complementary measures’ on energy efficiency and renewables. One factor not considered was the implication of fossil fuel build and price uncertainties (e.g. relative coal-gas prices and different power plant construction scenarios). Figure 2b shows the trend implications for EU ETS sector emissions, for a business as usual scenario including policies on energy efficiency, renewables and CDM.

Source: Carbon Trust (2009), Cutting Carbon in Europe: the 2020 plans and the future of the EU ETS, Charts 4 & 5a.

**Figure 3:** Accumulation of allowance surplus. Source: Neuhoff et al (2012)



Note: Figure 3 shows the volume of surplus allowances over time. With emissions much lower than allocations during Phase II (2008-12) the overall surplus (upper line) has grown rapidly; Phase II will end with 2.5-3 billion tonnes surplus to be banked forward to Phase III. However, the power sector has been ‘hedging’ its future position by accumulating allowances so as not to depend on future auctions. The shaded area shows the amounts respectively for ‘hedging’ coal (upper boundary of green area) or gas (lower boundary of green area). Projections (2012 onwards) are based on a ‘reference emissions scenario’.

## Understanding ETS price evolution and prospects

A common view is that allowance prices under the EU ETS would have risen towards levels projected by the European Commission (around €40/tCO<sub>2</sub>) but for the impact of the European recession which has reduced the underlying demand for allowances. While the recession has clearly played an important part in driving allowance prices down, there have been many other factors. Almost all emissions target and trading schemes, including the original USA SO<sub>2</sub> scheme, UK targets for energy intensive emissions and its domestic scheme, the USA Regional Greenhouse Gas Initiative, and Phase I of the EU ETS, have seen similar patterns of ‘boom and bust’. The underlying reasons for the boom-bust patterns in these schemes are unrelated to recession (e.g. Grubb, 2006).

More specifically, deep uncertainties existed irrespective of economic growth rates. Figure 2a illustrates the many influences on emissions volumes within the EU ETS: this analysis suggests that high allowance prices could only be possible if it was assumed that the EU did not achieve its complementary objectives on energy efficiency and/or renewables.

More fundamentally, there existed significant uncertainty about the likely demand for allowances, and hence the likely price range for allowances under the EU ETS. A 2009 study (Carbon Trust, 2009 p.31) stated: “Industry, in other words, has certainty about the existence of the EU ETS post 2012 – but not the price, which based on present evidence could be anywhere in the range €15-50/tCO<sub>2</sub> – or even conceivably outside this range”

The Commission’s initial projections of the carbon price under the package rising to €39/tCO<sub>2</sub> by 2020 were in 2010 revised down to a range of €17-25/tCO<sub>2</sub>. The sustained trading price of around €15/tCO<sub>2</sub> was not inconsistent with this expectation, allowing for discounting. However, with emission trends since 2008 declining well below the trend in Figure 2(b), and the growing impact of economic contraction in Europe on emissions, it is surprising that allowance prices held up as long as they did.

The likely explanation for this set out in Figure 3, which shows that at the same time as the surplus was growing, there was growing demand from EU power producers building up a bank of allowances (hedging) to ensure that they held allowances sufficient to cover expected future generation as the system moves towards full auctioning in the power sector. Power producers did not want to run any risk of getting ‘caught short’ at future auctions, and this concern has supported allowance prices until recently.

This hedging activity helped to keep the system in balance, even as a surplus was accumulating. Despite the Commission's success in limiting Member States' initially generous allocations for Phase II, the period 2008-12 will end with a large volume of unused emission allowances. This Phase II surplus can be banked forward into Phase III.

Given this, most analyses now suggest that the system will be in surplus to 2020. A Commission Staff Working Paper in January 2012 states that this surplus "potentially represent[s] the equivalent of 2.4 billion allowances by 2020" (European Commission, 2012).

Understanding this situation, and its fundamental drivers, has two important implications:

1. Low allowance prices are not a temporary phenomenon. These prices reflect a fundamental shift in the EU ETS market, where allowances under the cap (including banked allowances) exceed both the need for short-term 'hedging' in the power sector and the expected demand out to 2020. As a result, unless there is some intervention, the EU ETS as currently designed is unlikely to be a significant driver of low carbon measures during the rest of the decade. The resulting low allowance prices through to 2020 would be inconsistent with all the EU's efforts on the EU roadmap, and internationally.
2. A less well recognised implication, is that the surplus of allowances is not only due to the recession. The surplus and the resulting low price for allowances, was always a plausible outcome given that the original negotiations did not take adequate account of uncertainty in macroeconomic conditions, relative fuel prices, or the influence of Europe's of complementary targets on energy efficiency and renewable energy. It follows that simply removing a number of allowances estimated to 'compensate' for the recession may well not address the fundamental issues of intrinsic uncertainty and the tension between different instruments.

That mainstream projections out to 2020 have been proved so wrong in the space of just three years, and that this is not in any way a new pattern for cap-and-trade systems, is fundamental in considering how to respond.

## Quantity, price and revenue implications

An earlier Climate Strategies study (Cooper et al., 2011) analysed the potential revenues arising from auctioning in Phase III, and estimated that the prices projected by the European Commission in 2010 (ie. after downward revision for the credit crunch) would imply EU-wide revenues of €150-180bn total by 2020. It was also noted that strengthening the EU ETS could increase revenues substantially, perhaps up to €300bn by 2020.

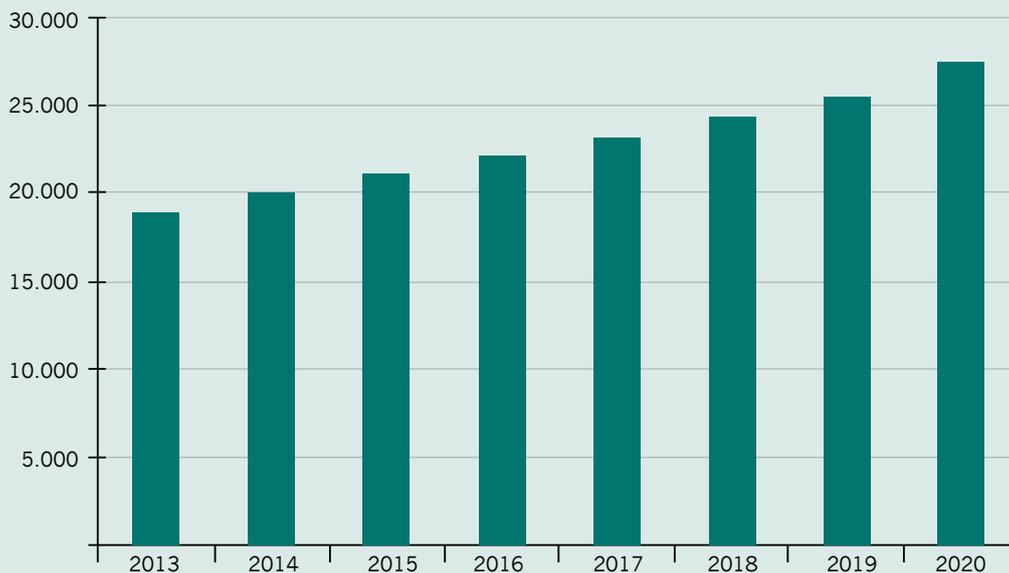
In practice, far from doubling potential revenues, recent developments in the EU ETS market have more than halved likely revenues. Deutsche Bank (2011) has predicted that allowance prices will remain below €10/tCO<sub>2</sub> throughout Phase III unless the EU ETS is strengthened; separately, UBS (2011) has predicted a €3/tCO<sub>2</sub> allowance price. Should allowances remain below €10/tCO<sub>2</sub>, revenues could fall to little over €50bn over Phase III of the EU ETS.

To give a sense of the potential revenue implications of measures to restore a higher carbon price, this analysis has been repeated for a case in which the carbon price is restored to €15/tCO<sub>2</sub> in 2013 and rises by €1/tCO<sub>2</sub> per year out to 2020. This is consistent with the Commission's 2010 projections (made after the 2008-9 recession), and is considerably lower than the original expectations. The results for EU auction revenues by year are shown in Figure 4(a), and cumulative total with distribution between some of the major countries is shown in figure 4(b)<sup>6</sup>. If the EUA price was €15/tCO<sub>2</sub> in 2013, rising linearly to meet the price levels expected in Commission scenarios (€17-25/tCO<sub>2</sub> by 2020) the total revenue generated would be €150-190 billion over the eight year period, with the range due to different possible approaches to free allocations and benchmarking. If the EU moved to a 30% GHG reduction commitment by 2020, and consequently reduced the ETS cap from -21% (against 2005) to -34%, revenue could increase to €200-310 billion.

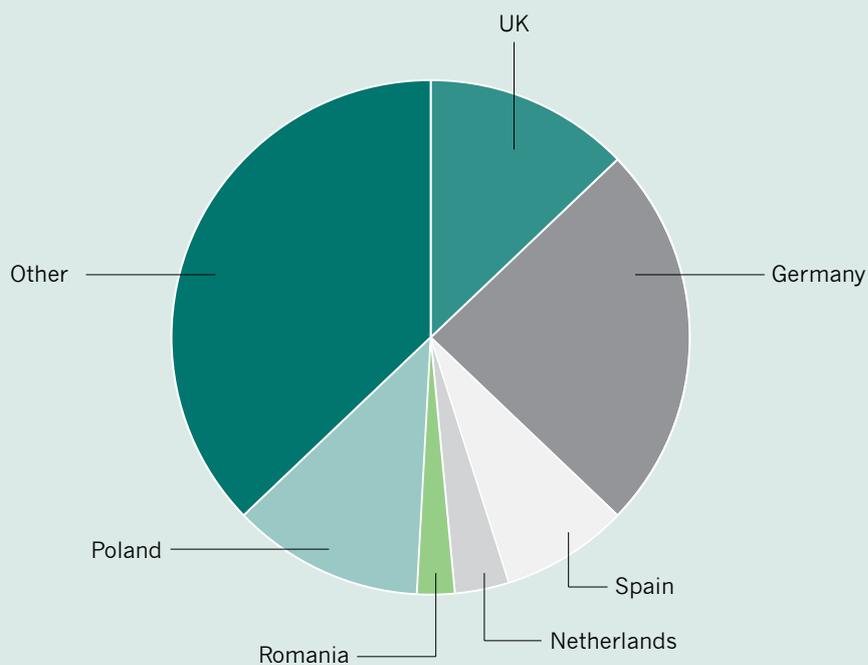
<sup>6</sup> The amount of free allowances to be given out by the EU-12 countries has not yet been finalised; this modelling assumes 70% free allocation in 2013, declining to zero in 2020.

**Figure 4:** Revenue implications of an EU ETS allowance price of €15/tCO<sub>2</sub> in 2013, rising to €22/tCO<sub>2</sub> in 2020

**A** Annual Revenues across EU (\$m)



**B** Distribution of cumulative revenues between countries (EU total (2012-2020) = €182bn)

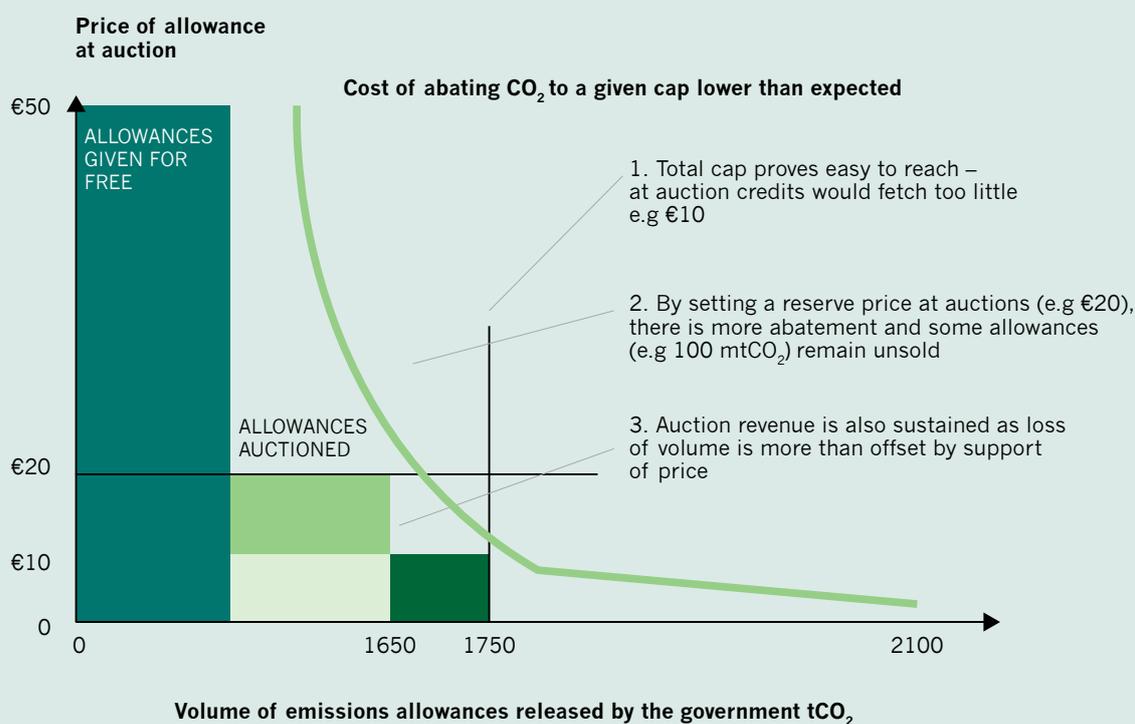


**Table 2:** Gross auction revenues in key countries, 2013 and 2020\*

	In 2013 (@ €15/tCO <sub>2</sub> )	In 2020 (@ €15/tCO <sub>2</sub> )
EU-27	€19 billion	€27 billion
Germany	€5.1 billion	€6.8 billion
UK	€2.6 billion	€3.4 billion
Poland	€1.6 billion	€3.3 billion
Spain	€1.6 billion	€2.2 billion
Italy	€1.7 billion	€2.4 billion
Greece	€0.8 billion	€1 billion
Netherlands	€0.7 billion	€0.9 billion
Romania	€150 million	€650 million

\*Note: See the caveats in text concerning indirect effects, and source: Climate Strategies: Cooper and Grubb (2011) for details of the calculation methods and alternate scenarios

**Figure 5:** Schematic of direct revenue and price implications of withdrawing allowances (e.g. through set aside or an auction reserve price)



Source: Carbon Trust (2009), Cutting Carbon in Europe: the 2020 plans and the future of the EU ETS, Chart 13a.

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Germany, as the highest emitter, would receive the highest proportion of additional revenue, even after the redistribution of 12% of the auction revenues to newer member-states. Revenues to eastern Europe, assuming that their power sectors receive the maximum allowable free allocation, would rise rapidly as this free allocation declines over time; cumulative revenues to Poland, Spain and the UK would each exceed €10 billion, and Greece would receive around €8 bn.

The overall revenue implications of possible interventions are more complex than this suggests. Any measure that raises prices implies that fewer allowances enter the market. It is almost certain that this would result in fewer allowances being auctioned; however, the exact impact would depend upon whether the measures also reduced the volume of free allowances. Raising more revenue by selling few allowances may sound counterintuitive but is in fact entirely consistent, because there is a steep relationship between price and volume. Figure 5 shows an example in which withholding 100MtCO<sub>2</sub>/y allowances (about 6% of allowances) doubles the price from €10/tCO<sub>2</sub> to €20/tCO<sub>2</sub>, and increases the overall value of allowances sold by around 80%.<sup>7</sup>

A deeper reason for questioning whether intervening to raise the carbon price might raise less overall revenue is if it has an adverse impact on economic growth, and hence on tax revenues. This is a complex debate, and most analysis on this topic assumes that the European economy is in an 'optimal' state upon which carbon prices impose a burden. Yet the EU economy is a very long way from optimal; it has huge unemployed resources (notably labour) and an unstable economic climate for investment. Other studies suggest a contrary conclusion: that by utilising these resources better (e.g. construction labour targeted to improve buildings energy efficiency), and stimulating greater investment and innovation through a combination of stabilising expectations and targeted use of revenues, a well-designed climate policy has the potential to boost economic growth (e.g. PIK, 2011).

Between these polar opposite views of the potential macroeconomic impacts of climate policy lies the opportunity for well designed response that will increase stability for EU energy sector investment. Such policy is likely to generate significantly more revenue under the ETS than is at risk from any indirect, secondary effects (which could be a mix of positive and negative). . If so, the direct revenue calculations given here provide a useful indication of the scale of impact. At a time of serious fiscal stress, the EU has lost an estimated €100bn from auction revenues compared to prior expectations: the fiscal implications of restoring prices closer to expectations would clearly be significant.

Any intervention will raise additional concerns and objections. For example, action that raises allowance prices will reignite debate about impact on the EU's industrial sectors, both in terms of 'carbon leakage' abroad and in relation to the windfall profit implications of free allocations. The Phase III rules on carbon leakage were negotiated with prices in mind far higher than those in the current market: the irony now is that with reduced industrial output, higher carbon prices would increase the value of the surplus held by most industrial sectors and increase the near-term profitability of these sectors.

Ultimately, emissions (or any other) pricing has potential distributional consequences: intervention in the market will stimulate these debates, irrespective of the mechanism of intervention. However, it remains that the EU ETS at present is not delivering on some of its key objectives, and in this context it makes sense to consider options for intervention.

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<sup>7</sup> The report annex (available online) presents some estimates which take account of the number of allowances withheld under various scenarios, and confirms that this does not change the fundamental message.

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## PART 2: OPTIONS FOR INTERVENTION

The preceding section has outlined the case for strengthening the EU ETS. We now consider the specific options.

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### Developing a post 2020 framework

Before considering specific near-term interventions, a crucial contextual factor is the need of many sectors for longer term clarity. Large energy and industrial sector investments have lifetimes of decades, and may indeed take many years to move from conception to operation. An earlier study by Climate Strategies and IDDRI on ‘Strengthening the European Union Climate and Energy Package’ underlined that for the purpose of investment in these sectors, there would be limited value in changing the 2020 targets unless this was set in a far clearer vision beyond 2020 – preferably to at least 2030. Increasing numbers of companies are also calling for longer term commitments.<sup>8</sup>

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Importantly, our earlier study emphasised that post-2020 negotiations needs to be about far more than just a 2030 emissions target. The complexity of investment processes, the different lifetimes and lead times associated with different types of capital stock, and differences in many other factors like competitive positioning, risk profiles, and dependence on infrastructure and planning procedures, all informed a recommendation that the EU should initiate as soon as possible processes to develop clearer structural and sectoral policies to 2030. A stronger EU ETS cap for 2030 was one, but far from the only, recommendation.

The EU Roadmap processes start to address this need, particularly for the power sector, and offer a foundation for what needs to be developed into a political process as soon as possible. There are, however, two reasons why this cannot substitute for nearer-term action on the EU ETS.

One reason is the likely scepticism and short-termism of many actors in the system. A 2030 GHG target might increase confidence about the future role of the ETS. This could provide a framework useful for strategic planning. However, given the current state of financial markets and market attitude to political risk, a 2030 target alone would have only a limited impact on the current price (due to high discounting in financial markets, which would have limited confidence that a 2030 target would remain unchanged for the next 18 years). The continuing financial turmoil in Europe has reinforced the short-term focus of many financial players, and industries too have to meet demands for shareholder value. The analysis by Neuhoff et al (2012) suggests that financial players in the EU ETS have discount rates typically approaching 15%/y: given this, even confident price expectations above €30/tCO<sub>2</sub> for 2020 (e.g. reflecting belief in strong post 2020 targets) could still leave present prices languishing.

The study by Neuhoff et al suggests that if the system can adjust volumes to within the 'hedging corridor' of power companies, this should introduce much stronger influence from players with lower discount rates and longer time horizons. Yet given the evolution of carbon prices to date, and the fragile politics of climate change at present, it remains unclear to what extent power companies would hold allowances today, or pay in the market, on the basis of political promises about post 2020 goals.<sup>9</sup> The EU ETS is suffering from declining credibility.

A second factor is the inevitable complexity of the process. Negotiating a 2030 target will be difficult enough, and may be linked strongly to progress in international negotiations the 2015 deadline established by the Durban Platform is an obvious focus. The difficulty and importance of the issues means that work on this needs already to be pursued, but in the current political climate it may be hard to finalise a 2030 goal, or even a Phase IV cap, before 2015: it could then take some time beyond that to reach the legislative books (see footnote 8). Solutions to the current malaise cannot credibly wait that long.

It is important to maintain momentum, to build upon the EU Roadmaps and turn them into political processes that can start to clarify frameworks and commitments to 2030. However, this should not be a substitute for solving the present problems in the EU ETS. Moreover, the continuation of low allowance prices could itself undermine the efforts to strengthen post 2020 frameworks, since industry would in particular be keenly aware of the disjuncture between the present reality and future aspirations.

Negotiations on post-2020 commitments have a complex agenda which also needs to learn from history and provide a more robust system. This process cannot be rushed as a fix to the present price. As a result, addition action is needed for the present situation of surplus out to 2020 to be addressed. There are a range of options for intervention, which can be divided into two categories:

- Quantity measures which focus on reducing the number of emission allowances
- Price measures which focus on reducing the price risk, either in the market or available to specific investors

We consider each in turn, against the two primary and two secondary objectives indicated in Part 1, and also crucial issues around delivery. The overall assessment is summarised in Table ES-1.

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<sup>8</sup> For example Eneco (the Netherlands), Dong Energy (Denmark) and SSE (United Kingdom), called in late 2011 for binding 2030 targets on carbon reductions, renewables and energy efficiency.

<sup>9</sup> A legislated Phase IV ETS cap would send a stronger signal to markets, but the process of analytics, negotiation and legislation would be subject to all the delays indicated; it might be logically hard for the EU agree a Phase IV cap in advance of a longer term target or the outcome of the 2015 global target. Moreover, there is paradox in the current situation: if no action is taken, the continuing low price will reinforce the perceived risks around Phase IV prices; alternatively, if action is taken without extremely clear rationales and principles, it will increase the perceived risk of interventions to Phase IV.

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## Strengthening the ETS by reducing allowances

Most of the current debate about how to strengthen the EU ETS focuses on reducing the number of allowances available. This could be done in three main ways.

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### 1) Tightening the greenhouse gas reduction target

The EU has indicated that it would increase the 2020 GHG reduction target from 20% to 30% below 1990 levels if there were comparable commitments from other major emitters. The Durban agreement can be interpreted as a commitment in principle to reach such an agreement, but no specific commitments beyond the set of non-binding Copenhagen-Cancun statements appear likely before 2015 at the earliest.

The EU could increase its target without comparable commitments, but the politics of this appear difficult. There were efforts to do this after the Cancun conference; however, consensus over a draft Council conclusion to increase the EU's GHG emissions reduction target to 25% below 1990 levels by 2020 was not achieved (principally due to concerns from Eastern European members, including Poland, over the role of coal in electricity generation). At the same time, other EU governments have argued that the EU's GHG reduction target should be tightened to 30% below 1990 levels by 2020. A tighter GHG target could be linked to the Durban agreement and a second commitment period of the Kyoto Protocol: the EU has said that it will table its proposal on this on 1 May 2012.<sup>10</sup>

Such political judgements are ultimately the preserve of government, not research, but there is also a legal dimension. A GHG target can be set through a European Council and Parliamentary procedure: the 2020 GHG target could be tightened (or a 2030 target set), without having to negotiate or re-negotiate an entire Directive. However, it could only have a direct impact on the EU ETS market if it were also translated into tightening the cap on the EU ETS itself, which is written into the Directive.

### 2) Tightening the ETS cap/trajectory

A second option is to directly amend the ETS cap, without negotiating change to the whole-of-economy 2020 target. Tightening the cap, and in particular the trajectory, is a conceptually simple measure that would lift the price, though as discussed below it would be hard to judge the actual price effects. To limit uncertainties for market participants, a clear rationale for re-visiting the cap would be needed: the economic recession, and that the current trajectory appears clearly inadequate compared to the EU's mid-Century goal, could provide a clear rationale.

However, establishing agreement over the new cap would appear to be a complex process (similar to the original cap-setting process). The current EU ETS cap (21% reduction in 2020 relative to 2005) is based on an annual linear reduction of 1.74%, derived from extensive economic analysis and political debate around the 2020 target, much of which is now outdated.

The EU could increase this downward trajectory, as the Commission suggested in March 2011. The Environment Committee of the European Parliament tabled an amendment to the draft Energy Efficiency Directive (EED) to increase the trajectory to 2.25%/y, which was later changed to a requirement for the Commission to make proposals for a tougher ETS cap soon after the EED enters into force. However, the timing of the EED's entry into force is not certain.

Proposals to strengthen the ETS cap/trajectory have strong support from some environmental groups, particularly since it would set a longer term trajectory more consistent with the mid-Century goals.<sup>11</sup> Since it would not immediately remove the present surplus, the impact on the price would depend on the extent to which the market players would look ahead to the rising value of carbon constraints over the longer term, which is particularly hard to judge (see discussion on the different discount rates of different actors in the system noted above).

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The ETS Directive, in its revised 2009 form, states that “emission allowances allocated in respect of [covered] installations should be 21% below their 2005 emission levels by 2020” and that “the annual decrease of allowances should be equal to 1.74%”. It does not say “at least 21% below” or “at least 1.74%”. The words ‘at least’ appear before the reference to a 20% GHG reduction by 2020, but as this target is not set by the ETS Directive it can be tightened through other policy developments. But the ETS cap and the annual reduction are set by the ETS directive, and specific numbers written into the Directive. So changing the cap number would appear to require an amendment to the Directive.<sup>12</sup>

Amendments to the EED have so far only been tabled by the Parliament’s Environment Committee. Although it is widely accepted that energy efficiency would lower the price of allowances (reduced energy use lower emission, and hence demand for allowances), the cap is the central measure of the ETS: the argument that it should be set under the ETS directive appears hard to resist.

Tightening could be achieved through a new piece of amending legislation. For comparison, the first (1996/1998) and second (2003) internal energy market Directives in electricity and gas envisaged market opening timetables which were much slower than those now in place after the third package Directives of 2009. These slower timetables were simply speeded up by the adoption of each new set of Directives. However, in the current EU political climate, there is understandable reluctance to re-open the ETS Directive: there is a concern that this could, counterproductively, risk exacerbating further the uncertainties facing EU industry.

### *Restricting CDM offsets – one means of lowering the ETS cap.*

Phase III of the ETS allows less use of CDM offsets than did Phases I and II. One way to lower the Phase III cap in effect would be for future EU legislation, including possible measures to tighten the 2020 cap, to be more restrictive on CDM credits. However, ending CDM offsets would undermine the EU’s efforts to foster global action. Despite controversies, the CDM has channelled substantial amounts of finance to support low carbon investment in developing countries; this in turn has supported increased involvement of developing countries in low carbon investment, alongside important diplomatic gains.

The EU could instead offer direct investment for low-carbon projects to developing countries. However, the EU is behind schedule in providing additional support for the Climate Fund which was agreed at the 2009 Copenhagen climate summit, and developing countries might see an increased risk associated with direct support for low-carbon investments (rather than support via the CDM).

Underpinning the CDM was the idea that climate change is a global problem in which developing countries need to be engaged; at the same time, developing countries offer some of the cheapest options for reducing emissions. To drive up costs in Europe by restricting even further the incentives for European companies to invest in emission reducing projects abroad, and potentially alienate developing countries at the same time, would seem a counterproductive response to the present situation.

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<sup>10</sup> That only one Member (Poland) has openly opposed the draft Council conclusion in summer 2011 suggests that a Commission proposal might be accepted by the Council under Qualified Majority Voting. However, Poland is not alone in its concerns about impact of the EU ETS target on emissions intensive industry.

<sup>11</sup> WWF estimate that reducing ETS emissions by 2.25% a year would cancel more than 8.5 billion allowances by 2050 compared to the present trajectory, and bring the trajectory to be consistent with the EU’s target for GHG reductions by 2050.

<sup>12</sup> The EU ETS Directive does say that “the Commission shall review the linear factor and submit a proposal, where appropriate, to the European Parliament and to the Council as from 2020, with a view to the adoption of a decision by 2025”. So an increase in the downward trajectory after 2020 would be consistent with the Directive, but not one before then.

### 3) Setting aside allowances

A third option is to 'Set-Aside' some allowances. At least initially, this would have a similar impact to lowering the cap, except that the withdrawal would be immediate rather than implicit in a tightened trajectory. The allowances could be placed in a strategic reserve, potentially available to be returned to the system later.

Set-aside could probably be implemented without a revision of the ETS directive, for example through a "Committee procedure" (Comitology), on the basis of Article 10(4) of the EU ETS Directive. The simplest mechanism would involve rescheduling auctions, so that fewer allowances were released earlier on in Phase III. However, most interpretations suggest that, under the Directive, the full allocation of allowances under Phase III would still have to be released before the end of Phase III.

There also appears to be a stronger case for setting aside allowances through the EED, than would be case for a directly lower ETS cap or steeper trajectory. The European Parliament's environment committee tabled an amendment to the EED that 1.4 billion carbon allowances should be set aside during Phase III, and the principle of set-aside was endorsed by the EU Parliament whilst specific numbers were removed in favour of calling on the Commission to develop a specific proposal.

For these various reasons, set-aside would seem quicker to negotiate and implement than a formal tightening of the ETS cap. Set-aside under the EED could prevent allowance prices falling further (due to energy efficiency effects, or a continuing recession), and even if it was only linked to energy efficiency, could nudge the price upward. The final impact on prices would depend on the number of allowances set aside and on wider economic conditions, as well as the degree of certainty over whether, when and under what conditions allowances might be returned to the market.

Immediate set-aside of allowances could have a greater prompt impact on price than other quantity responses. However it would also introduce a new element of regulatory uncertainty: once the precedent for intervention through set-aside has been set, investors may be concerned that intervention could occur again in the future.

These risks could be ameliorated, though not entirely avoided, by:

1. defining a clear basis for set aside (for example, to match progress in energy efficiency);
2. defining a clear basis for quantification;
3. being clear about what precedent the set-aside represented, and the circumstances under which it could be repeated;
4. indicating clearly whether and if so under what conditions allowances might be returned to the market.

Despite the potential complications, set-aside is clearly the 'front runner' in terms of options, and also has attracted significant corporate support.<sup>13</sup> The apparent legal need to return allowances to the market by the end of Phase III could presumably be addressed by specifying the terms under which this could happen, by overriding this through the EED Directive, or simply by an understanding that if Phase III remains in surplus as expected, the cap negotiated for Phase IV should automatically be adjusted to absorb the Set-Aside volume that would be released and immediately 'banked' forward.

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## The price impact of Quantity responses

The ETS was not designed to deliver price predictability; rather, it was designed to deliver volume predictability, with the price decided by the market. Major uncertain influences on the price include:

- The economy. All economic forecasting is subject to uncertainty, and the future economic situation in the Euro area is currently extremely uncertain. The latest IMF forecast for Euro area GDP growth in 2012 is -0.5%, and the level of economic activity clearly has an impact on emissions. A previous Climate Strategies paper (Bowen 2009) concludes that “for a given mix of energy technologies, a 0.8% reduction in emissions for every 1% reduction in GDP does not appear to be an unreasonable assumption” over the medium to long term. However, the emissions reduction (and hence price impact) would be greater in the short term, as unexpected economic downturns are initially likely to hit more energy-intensive industries harder than output as a whole.
- Coal-gas price differential. The difference between coal and gas prices does much to determine the short to medium term cost of reducing emissions in the power sector. Fossil fuel prices have been quite volatile over the previous few years, and there is no reason to think this will be different in the future; forecast gas prices by the end of the decade in particular vary by at least a factor of two.
- Other energy-related policies. As noted, both renewable energy and energy efficiency policies, by contributing to emission reductions, reduce the price of CO<sub>2</sub> in the EU ETS as it is currently designed.

Some very simple illustrative scenarios suggest that even after a set-aside of 1,400MtCO<sub>2</sub> (as currently proposed), prices could be quite uncertain. A simple indicative ‘stress test’ exercise<sup>14</sup> groups uncertainties in terms of impact on energy demand (economic growth rates, energy efficiency policies), and energy supply mix (relative energy prices, retirement and build rates for gas generation and renewables). By its nature, uncertainty is hard to quantify, but it suggests that uncertainties in underlying ‘reference’ emission levels could approach +/- 1,000MtCO<sub>2</sub> over Phase III. Translating this into price impacts adds further uncertainty, but simplified relationships between quantity and price suggest that Phase III average prices could then still range from €10/tCO<sub>2</sub> to €30/tCO<sub>2</sub>, or possibly outside this range, at least unless and until a post-2020 agreement clarified the potential value of banking allowances. A striking feature of most analyses to date has been their lack of detailed uncertainty analysis.

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<sup>13</sup> A group of companies which back a tougher ETS cap published a joint letter with environmental NGOs E3G and Bellona Europe on 19 December 2011. The full list of signatories to this letter was: Alstom, Dong Energy, Bellona Europe, Climate Markets and Investment Association, Shell, SSE, Doosan Power Systems, E3G, Eneco, EWEA, Tyco, Germanwatch, Danish Energy Association, Eurec Agency. The text read: ““We support withholding EU ETS allowances because:

- It is necessary to maintain the level of ambition agreed in the 2008 energy and climate package, and to incentivize investment in low carbon technology development and energy efficiency;
- Major structural changes to the current ETS Directive are avoided;
- Energy intensive industry is largely protected from a strengthened carbon price due to the allocation of allowances at no cost and sectors are eligible for compensation to cover increased electricity prices;
- An increased carbon price will boost the revenue raising potential from the auctioning of allowances by Member States;
- Restoring the carbon price signal will increase the value of the NER 300 which is essential to develop vital innovative renewables and Carbon Capture & Storage technologies;
- It allows the EU to continue leading the international climate debate, by demonstrating the effectiveness of its domestic regulation and promoting the emergence of compatible schemes elsewhere in the world.”

<sup>14</sup> See separate Annex for details

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## Strengthening the ETS by measures relating directly to price

The preceding section has considered a number of approaches to affecting allowance prices, with an intended one-off adjustment of quantities. Another approach is to consider mechanisms that could intrinsically help to maintain prices in the face of uncertain future developments.

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Given that the core concern over the current EU ETS market is about allowance prices too low to deliver key objectives, a price-related adjustment mechanism would seem to be an attractive approach to improve longer-term price confidence for investors.

The quantity targets of the ETS have an intrinsic value in setting the context for corporate strategy, and in drawing attention to numerous issues beyond pure price (Neuhoff et al, 2011). The ETS cap sets a certain pathway of emissions, whilst trading provides a price and the system overall enables price discovery.

However, it is an unusual market in which supply is fixed (set by the cap) and unresponsive to price, whilst demand is potentially very uncertain; it seems

a structure with inherent risks of instability (Grubb, 2009). Moreover, the repeated discovery that it seems far cheaper to hit a negotiated quantity than expected, a feature now common in most quantity systems to date, even long before the EU ETS (Haites, 2005), legitimately raises the question of what to do about it, in a systematic rather than ad-hoc way.

Potential answers draw upon now well-established economics literature about the value of 'hybrid' instruments to cope with real-world uncertainties; see for example Pizer (2002), as well as Hepburn e.a. (2006) and Grubb and Newbery (2008). These instruments offer the potential for providing greater certainty regarding prices and investment signals, while maintaining the advantages of a trading scheme.<sup>15</sup>

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<sup>15</sup> Some economists argue for a carbon tax instead of ETS. This does not enable any minimum guaranteed environmental goal and its efficiency depends more heavily on the assumption of an efficient energy market, rather than a broader focus on all the factors that affect emission quantities. Also, whilst ETS aids price discovery, a carbon tax would not deliver complementary clarity about the emission reductions achieved, which would always be uncertain since they would be an unobservable change from what would have happened otherwise. Moreover the empirical evidence (including the EU experience of the 1990s) is that carbon taxes have been far harder to establish than emissions trading, and even messier in practice because of the political need to grant various exemptions. In trading systems, free allocation offers an easier route to address such political economy factors, whilst firms still retain some incentive to reduce their emissions through the latent carbon price in place. Despite the limitations of the EU ETS, establishing a single carbon price across the EU has been a remarkable political and economic achievement, now firmly rooted in EU law. There seem no grounds for believing that a carbon tax would be either more effective, or politically plausible; hence this report's focus on how to strengthen the EU ETS.

<sup>16</sup> The level of reserve price would obviously have to be negotiated. In our illustration in Part 1 we examined revenue impact of a price starting at €15/tCO<sub>2</sub>, rising at one euro a year until 2020, so reaching €22/tCO<sub>2</sub>. Many major low carbon investments (particularly those involving CCS or offshore engineering) may require prices over €30/tCO<sub>2</sub> (so it could logically be argued that a floor price should be set at this level; Henningsen, 2008). Ultimately of course, any level set would be the outcome of a political process.

<sup>17</sup> The UK Energy White Paper (2011) estimated that the certainty provided by its long-term contracts combined with price floor would reduce the cost of capital to power sector investors by over 1% per year, saving potentially billions of pounds in the overall cost of investments.

#### 4) Reserve Price Auctions (RPA) and related automatic adjustments for the ETS

One approach would be to establish that, from the start of Phase III, no allowances would be auctioned at below a specified price; this level could start fairly modest and rise.<sup>16</sup> Allowances not taken up at auction could be either cancelled or carried forward to future auctions. Present free allocations would remain unchanged, but their value would increase: prices within the EU ETS would rise immediately given the knowledge that additional allowances would only enter the system if and when the price reaches the level set. Given a sufficient volume of auctions, which is the case in Phase III, this would de facto result in a floor price: if most allowances will only come into the system at a price at or above a reserve price, then participants will be reluctant to sell allowances below the reserve price.

Irrespective of the initial level set, establishing a rising floor price through a European Reserve Price for Auctions (RPA) would give confidence for investors regarding a minimum allowance price in the EU ETS. It would remove large perceived downside risks, support low-carbon investment decisions, and reduce the cost of capital, which could result in substantial economic savings.<sup>17</sup>

It would also 'protect' the system not only against recession, but would soften the consequences of success in energy efficiency and other 'complementary' policies: if these measures resulted in prices falling towards the reserve price, real system-wide emission reductions would follow as fewer allowances were bought at auctions.

However, at present the system is so oversupplied that an RPA on its own would in effect set the price for many years hence. There would be little trading, and the quantity value of the system, with its associated upside potential for investors, could be fatally undermined. This is one reason to consider RPA as a component of responses, as discussed in Part 3 of this paper.

A European RPA would avoid the market distortion that national price floors (considered below) introduce; however, to achieve this, RPAs would need to be agreed across all auction platforms. The European Commission is already involved in setting the rules for the platforms, in response to previous problems with fraud.

Under the ETS Directive, the Commission has a responsibility to monitor the functioning of the European carbon market. Each year, it shall submit a report to the European Parliament and to the Council on the functioning of the carbon market including the implementation of the auctions, liquidity and the volumes traded." The very low carbon price is an aspect of the functioning of the carbon market, so the Commission could legitimately make RPA proposals in its next report. However, implementing RPAs would require amendment to the secondary legislation on ETS implementation adopted in 2010 via Committee procedure: this would require Qualified Majority Voting.

The net effect of an RPA would be to result in allowances not entering the market due to the minimum price set rather than a central quantity decision. Within the terms of the current Directive, this would appear to raise the same legal issues as a politically-determined quantity of set-aside: what happens to any allowances not auctioned, and in particular whether and under what terms would the allowances be returned to the market? It appears that RPA would seem amenable to the same approach as under set-aside.

At present there seems limited support for RPA in EU institutions, with concerns about potential 'interfering with the market' being expressed. Yet the attraction of RPAs is that they are (or should be) set in advance, in which case they represent no more interference in the market than any reserve price auction approach (most governments set reserve prices on bond auctions, for example). In addition, it appears hard to understand why quantity mechanisms such as set-aside represent less market intervention than RPA approaches, particularly when there is little future certainty about the volume of set-aside.

One outcome of this reluctance to consider price-based adjustment mechanisms, alongside the demand of investors for greater price confidence, seems to be that it will drive other forms of price-related measures at national levels.

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## 5) National contracts and price floor(s)

With little support from the European Commission for some form of price support<sup>18</sup>, action could be taken by individual Member States in a number of forms. The approach which may raise least political resistance is to issue specific government-backed contracts to large investors. As suggested most recently in a report by Bruegel (Zachmann et al) this would involve:

*“... bilateral option contracts between public institutions and investors. The public institutions would guarantee a certain carbon price to an investor. In case the realised carbon price is below the guaranteed price, the public institution (the option writer) will pay the difference to the investor (the option holder). Hence, in case of a low carbon price that might be detrimental to the competitiveness of a low-carbon investment the investor gets some compensation. Thus, the investor's risk is reduced. At the same time, if the public institution issues a large volume of option contracts, it creates an incentive not to water down future climate policies. Policies that reduce the carbon price will have a direct budget impact by increasing the value of the outstanding options. This would tend to increase the long-term credibility of carbon policies.”*

This ‘carbon contracts’ idea has been around for several years,<sup>19</sup> and now forms a cornerstone of the UK’s Energy Market Reform, precisely because of the recognition that the EU ETS in its current form cannot support the kind of investment required.

Whilst a potentially useful tool, carbon contracts only work for specific, large investors: this approach also risks being overly bureaucratic, with some risk of regulatory gaming & capture. As a result, it is sometimes seen as a fall-back position that could reduce the price risk facing large power investors but without many other applications, and these factors inevitably limit its role.<sup>20</sup>

This, and also the financial exposure such an option places on government, in practice reinforces rather than substitutes for the need for a price floor across the system. Thus, in addition to long-term contracts, the UK Energy Market Reform includes a price floor set through retrospective tax levels contingent upon the EU ETS price.<sup>21</sup> This combination increases price certainty for investors in the UK, the contracts acting to underwrite investors against risks not only of EU ETS price fluctuations but also the fact that the UK Chancellor can decide to change tax levels at any budget. From a Treasury perspective, this has an advantage not only in reducing the government liability, but it raises revenue from carbon emissions without the 12% redistribution to eastern European countries required from EU ETS auctions. However, a significant downside is that a national price floor also introduces competitive distortions within the EU. The UK government has responded to this concern by offering financial support to energy-intensive sectors to compensate them for the price floor, further complicating the system.

Finally, such national measures are unlikely to reduce ETS-wide emissions. National measures lead to fewer allowances being purchased for use in one country, which are then available elsewhere, depressing the EU ETS price.

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<sup>18</sup> Commission officials do not appear to support price support measures. A European Commission spokesman for Climate Action, Isaac Valero Ladron, told Reuters in January 2012 that: “The Commission does not support the idea of a price floor. We don’t have a price floor, we will never propose a price floor.” (Wynn, 2012). Climate Action Commissioner Connie Hedegaard, who is responsible for the ETS within the Commission, also argued in February 2012 against any intervention in the market (Hedegaard, 2012).

<sup>19</sup> See for example Helm (2004), Newbery (2005), Neuhoﬀ and Ismer (2006), Grubb and Newbery (2008) for various expositions, together with citations in the Bruegel report (Zachman et al, 2012).

<sup>20</sup> Because such contracts would inevitably be negotiated by individual Member States, and would diﬀer, they could also start to open up challenges around State Aids, and this has significantly constrained and influenced the UK design.

<sup>21</sup> Specifically, the Climate Change Levy (CCL) (which despite its name was an energy tax rather than an emissions tax) is being changed into an emissions tax, and applied to fossil fuels used to generate electricity at rates that take account of the average carbon content. These rates will be set taking account of the EU ETS price, so will be called the ‘CCL carbon price support rates’. The price floor will begin at £16 (€19.3) in 2013, rising yearly in a linear fashion to reach £30 (€36.2) in 2020 (Ares, 2011).

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## Other approaches and objections

The options considered in this report are not exhaustive. For example, one hybrid of national and European policies would be if a group of countries bought back EU allowances, thereby raising the price across Europe. Were a number of large-emissions countries within the EU ETS to collaborate on this, their own net revenues would also rise alongside price rises for allowances across the EU. Indeed, if they agreed a target price, it would still set a de facto floor price.

For a wholly different approach to prompt intervention, ClientEarth (2011) proposed that the Commission could alter the allowances issued for 2013, thus resetting the baseline for the linear reduction for the rest of the period. This rather dramatic approach does not appear to have significant support.

This (and set-aside) reflect in particular concerns about the impact of banking allowances forward, particularly if the surplus accumulates as has been the case (Figure 3). There are many good theoretical reasons for banking, but a serious problem is revealed when transferring a largely 'unearned' surplus to the future drastically weakens future ambition. In the present situation, this underpins the proposal for set-aside. An interesting suggestion to address such concerns automatically in trading systems is to 'cap' the volume of allowances that could be banked forward. Such an approach could also be applied within a period from year to year to smooth the impact on the market.<sup>22</sup>

Another approach is to rely more heavily on a combination of banking with sequential target negotiations. If targets are negotiated every five years, for example, and there are clear institutional guidelines around the processes of cap-setting, this provides an opportunity to correct for any growing surplus through a tighter subsequent cap. This might work for systems with no more than 5-year periods, but the move to eight years for Phase III of the EU ETS makes for a gap which, as indicated at the beginning of Part II of this report, precludes this working without unreasonably long hiatus.

Moreover, a significant drawback is that relying on experience within one 5-year period to set the next 5-year cap leaves business (or others) with very limited foresight of future caps, other than through guessing how the bodies responsible will interpret the institutional guidelines. Were such guidelines explicitly included future price-related goals, this could provide an alternative to reserve price auctions, but the advantage is unclear.

Another suggestion for handling price uncertainty has been a Carbon Bank: in 2008, the former British Prime Minister, Gordon Brown, suggested creating an independent European carbon bank. He suggested that this could take over the role of setting the EU ETS cap from the Commission and national governments, and potentially take an active role to help adjust or stabilise the system if needed. More limited roles might include involvement in set-aside decisions, or allowance buy-back at times of low price. There may be a long-term value in this, but the creation of another European institution, including all the issues around its governance, objective, mandate and powers, does not appear achievable in the near term.

This study has suggested Reserve Price Auctions as a mechanism which appears relatively simple, and reflects an underlying principle of 'duality': handling uncertainty through explicit attention to price as well as quantity goals.

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<sup>22</sup> Erik Haites, personal communication in response to CS online review of the draft of this report: "An alternative on-going solution is to build automatic, small adjustments into the rules. If unforeseen circumstances lead to larger reductions than anticipated, part of that reduction is captured as an environmental benefit, which after all is the objective of the scheme. Specifically, if the accumulated bank exceeds X% of the annual emissions, the number of allowances issued for the next year is reduced by the excess. So if after the compliance determination in April 2012 the bank is (X+2)% of the 2011 allowance cap, the number of allowances issued for 2013 (2012 allowances have already been issued) is reduced by 2% of the 2011 cap. If the bank is smaller than X% of the 2011 emissions, there is no adjustment to the 2013 cap. Adjustments, when they occur, are likely to be small, so they will have little effect on the market. And making them automatic means that political decisions, and the associated uncertainty, are avoided."

In broad concept, a similar approach has been suggested by the Carbon Market Investor Association, proposing that if a certain number of surplus permits have not been used after a period of three years, an equal number of permits should be removed from later supply (CMIA (2011), as cited in O. Sartor (2012).

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A common objection to many of the measures outlined in this report is that they would “interfere with the market”. The EU ETS market (in common with other systems for regulating ‘externalities’) has been constructed by political decision-making: indeed, most markets are regulated to mitigate the risks of excessive *laissez faire*. The EU ETS is a means to the objectives outlined: the relevant question is whether the system is delivering what was intended, and the specific pros and cons of options (including impacts on market confidence, which of course does risk being eroded by almost any intervention). Hence the emphasis of this report on being clear about the Objectives, rather than a focus on market purity.

Whilst many stakeholders accept this, particular opposition to a price floor seems to stem from three concerns. One is a simple misunderstanding: that intervention amounts to governments playing an on-going, activist role in the market. It does not: Reserve Price Auctions can set out terms clearly in advance. Another is that it is unduly interventionist, with concerns that a ‘floor price’ represents the emergence of a ‘managed market’. However, it is unclear why a price-based measure is any more interventionist than withdrawing allowances: indeed, RPAs would set out clearly and transparently the conditions under which additional allowances would (or not) enter the market. Setting out the rules clearly in advance is not ‘interfering with the market’, but part of designing the market: this is a feature of other markets, with governments setting reserve prices on auctions in (for example) bond markets. It seems unclear why setting a reserve price in EU ETS auctions is more objectionable than in other government-led (or private) auctions.

The final concern is that a price floor might be accompanied by a price ceiling, which has been variously opposed as weakening the level of environmental ambition or amplifying concerns about a ‘managed market’. Whilst price floors and ceilings are logically separate, and are motivated by entirely different concerns, it is indeed possible that they might be politically linked. The pros and cons of price ceilings are beyond the scope of this report, though we note that both Australia and California have adopted price corridors as illustrated in the final part of this report. Again, this speaks to the need to be clear about Objectives, and to work from these to consider design choices.

The more generic objection to intervention is that it risks ‘changing the rules’ after agreeing Phase III. However, the arguments set out in Part 1 do suggest a sufficient procedural case for action:

- The original Phase III agreement included intent to move to a stronger target in event of an effective global deal, which was hoped for at Copenhagen. It thus never did provide a fixed set of rules for investors but was crafted in the expectation of strengthening; that may still occur (in 2015), but such a delay will deter investors. As outlined in the previous section, global action has not stopped but is developing in different ways; the EU ETS is no longer the only system, or possibly even the strongest system.
- The original Phase III deal was itself inconsistent, as the combination of complementary targets agreed on renewables and energy efficiency, together with the volume of emission offsets, would have limited the impact of the EU ETS. This raises questions over the level of integration of the full package of measures.
- The credit crunch and recession can plausibly be considered as *force majeure*, justifying some retrospective response.

The key question is not only whether the EU is ready to make the (necessary) recalibration associated with a one-off set-aside, but also to explore, systematically and pragmatically, enduring solutions to handling uncertainty.

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## PART 3: POLITICAL AND INTERNATIONAL DIMENSIONS AND WAYS FORWARD

It is ultimately for politicians and EU institutions to decide on the appropriate responses to the current EU ETS market, and they are probably best placed to judge political prospects. Nevertheless, some procedural and political aspects associated with each of the five options need to be overcome.

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### Quantity responses

- Tightening the 2020 GHG target faces the complexities of its historical legacy, international linkages and its coverage of all sectors of the economy, and would only directly help the EU ETS if it could be linked to tightening the EU ETS cap. The EU's decision to adopt a second Kyoto period commitment could, however, be a driver to support this response.
- Lowering the ETS cap or increasing the reduction trajectory may be problematic given the long-run trajectory implications and the need to change the EU ETS directive.
- Set-aside, partly linked to energy efficiency measures, has the support of the relevant European Parliamentary Committees, the Danish Council Presidency and significant parts of the energy industry, and would not require ETS Directive renegotiation. It is the clear front-runner, with a clear legal mechanism for implementation.<sup>23</sup> However, it will face the charge that it establishes a dangerous precedent of interference in the market, and does not provide any enduring price confidence for investors: indeed, by setting a precedent for intervention, on its own it could erode institutional confidence.

### Price-based and adaptive responses

- An EU Reserve Price on Auctions (RPA) has historically been explored least, and faces resistance from those committed to the current quantity-only approach. However, the EU is increasingly alone in this reluctance to embrace a reserve price approach: the US RGGI & Californian schemes, together with the Australian Carbon Price Mechanism, all have minimum price, and some parts of industry have suggested RPA from Phase IV. The legal issues facing an RPA in Phase III appear similar to set-aside, but adopting it in the current situation of surplus would virtually determine the price, instead of acting in appropriate role of 'reassurance' to investors by underpinning a trading market.
- National responses may be the most likely outcome, given the urgent need for investment in the EU energy system and the arguments from industry for greater certainty. This might build into a coalition of countries setting price floors: the UK is taking this approach, and France can be expected to be in favour given its reliance on nuclear power. Spain might also support such an approach, as the new government seeks additional sources of revenue, while the position of Germany is uncertain.<sup>24</sup>

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<sup>23</sup> A likely interpretation of the EU ETS Directive is that decisions on timing of emission allowances released through auctions can be made through Committee procedures (not requiring any revisions to the Directive), but that all allowances should be made available by the end of the period. However, it may be possible to negotiate the Phase IV cap so as to absorb any 'intended' degree of banked allowances associated with set-aside.

<sup>24</sup> Germany has set out an ambitious 'energy concept', with more than 90% of EU ETS auctioning revenues being used for climate measures (including energy concept implementation). Should EU ETS revenue be below forecast, this will place budgetary pressure on other areas of spending: a price floor, whether at a national or European level, would address this budgetary risk.

The opposition of some eastern European governments to stronger EU action on climate change might be mitigated as the revenue implications of a very weak price, and/or of national measures by other countries, become more apparent. Overall, however, the politics of pursuing any change are unlikely to be straight-forward. As noted, there are some other options that could be considered, but none on their own seem obviously preferable, from either a technical or political perspective.

At the time of publication, the procedural situation is as follows. The context is set by the negotiation of the EU's Energy Efficiency Directive, on which the EU Parliament tabled numerous amendments. Following on from broad-ranging proposals from the Environment Committee, on 28 February 2012 the Industry, Transport, Research and Energy Committee (ITRE) voted for an amendment which would require the Commission, to consider whether to take measures, before the start of Phase III. Such measures "may include withholding of the necessary amount of allowances".<sup>25</sup> The proposal is likely to be adopted by the EU Parliament, and this would then go to the European Council.

ITRE did not seek to require the Commission to set aside allowances, nor did it identify a specific number of allowances to be set aside (unlike the Environment Committee which had called for 1,400MtCO<sub>2</sub> allowances to be set aside). That decision, and the terms under which allowances might be held back, would be left for the Commission to analyse and propose.

Quite apart from the politics, however, the issue that policymakers seem to be facing that no single option solves all the core problems. Apart from doing nothing – probably the most damaging option of all – perhaps the most plausible response is set-aside, combined with efforts to accelerate negotiations on 2030 targets and Phase IV of the EU ETS to give industry more strategic direction. However, there remains the risk that such negotiations may take a very long time, and/or that Europe would stumble into a repeat of the kind of problems that have already emerged for Phase III (before it has even started). The more Phase IV negotiations are accelerated, and the earlier the commitments are adopted, the greater the risk of getting it wrong, again.

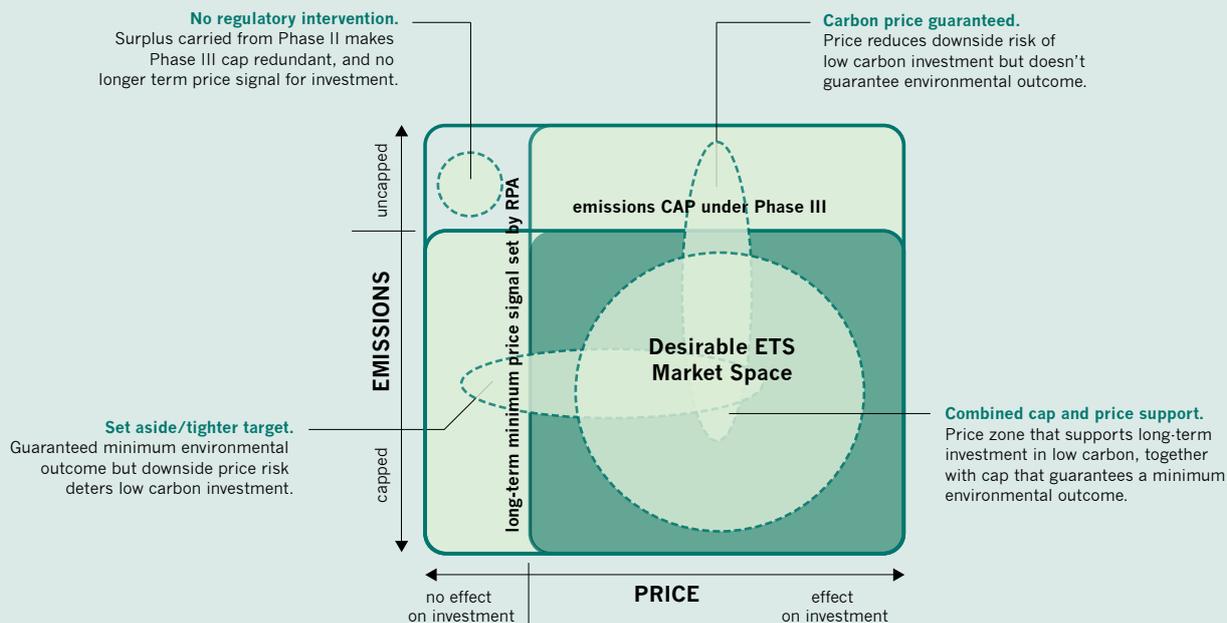
## Ways forward

The EU ETS is a central policy for Europe's climate policies and low-carbon transition, yet for a variety of reasons explored in this report, the relevance of the EU ETS to short and long-term emissions mitigation in Europe is being eroded. Action is needed to address the limitations of the current EU ETS, and set-aside is the support measure that could be agreed and implemented most quickly. Set-aside would 'recalibrate' the ETS to take account of the recession and continuing weakness of the European economy.

However, embarking on set-aside would not address the fundamental design challenge, which is around the relationship between quantity and price in an uncertain world. Set-aside could even increase the long-term uncertainty of the EU ETS in investor's minds. While set-aside would increase the price, it would not preclude the risk of another price collapse. Would European institutions decide at some stage in the future that another recalibration was necessary? And under what conditions might they return allowances to the system? Much would hinge upon the clarity of the terms for a set-aside approach to be successful.

The underlying challenge is set out in Figure 6. There are differing objectives – quantity and price – with different actors looking over different timescales. At present, even the quantity objective is questionable, as the surplus from Phase II renders the Phase III cap largely redundant. More fundamentally, the relationship between quantity and price is, in reality, extremely uncertain: almost all caps set to date (in the EU ETS and elsewhere) have ended up with prices lower than expected, and there remains uncertainty over the real impact of price on emissions over different timescales. Policy needs to target a zone that gives reasonable reassurance to the different actors on these differing objectives.

**Figure 6:** Price and Quantity in the EU ETS



**Table 3:** Illustrated Phase III carbon price sensitivities for different policy states

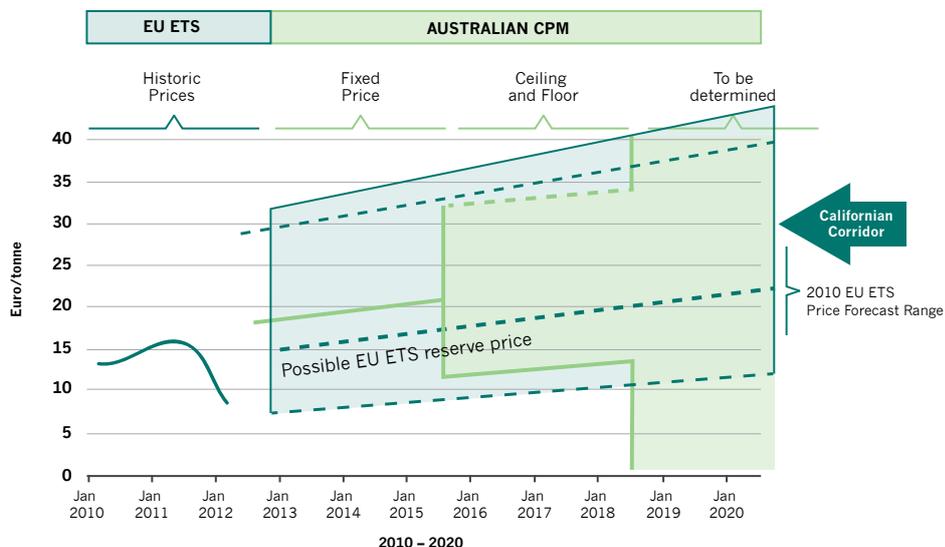
	Lowest emissions trend	Central emissions trend	Highest emissions trend
No intervention	Below 5	5–10	10–16
1400MtCO <sub>2</sub> Set-Aside	Below 10	20	Above 30
Reserve Price Auction	18.5	18.5	18.5*
Combined Set-Aside with RPA	18.5	20*	Above 30

Notes: For assumptions see Annex.<sup>27</sup> €18.5/tCO<sub>2</sub> is average price illustrated in the section on ‘Quantity, price and revenues implications’ in Part 1 of this report: €15/tCO<sub>2</sub> in 2015 rising at 1€/tCO<sub>2</sub>/year.

\*In cases with an ‘open trading’ price close to the level of Reserve Price Auction, the actual trading price would be higher than indicated since the RPA would reduce the downside risk to those buying or holding allowances at the prevailing price. Prices with set-aside under “high emissions trend” are particularly sensitive to assumptions about both quantity and the form of price responses (note also the modelling assumption that no allowances withdrawn are returned to the market).

**Figure 7: EU ETS Prices compared against Australian and Californian ETS price corridors**

The Figure illustrates trend of EU ETS prices since 2010, compared to the fixed price followed by price corridor in the Australian CPM, and the wider price corridor defined in the Californian ETS.



There needs to be confidence that set-aside is being considered as a once off ‘recalibration’, and the most effective approach to doing this would be to demonstrate to investors that the ETS will in future be more robust. One way to do this would be to link set-aside with a commitment to Reserve Price Auctions. This would be an effective combination of instruments, a hybrid approach as recommended in economics literature. Under such an approach:

- Set-aside would address a crucial problem of RPAs in the current market, being that the market has such an over-supply of allowances that an RPA on its own would effectively set the price.
- RPAs combined with set-aside would remove the need for any future recalibrations, and remove the downside risk of deep subsequent price crashes. Instead, they would in effect provide bankable insurance to reinforce the impact intended from set-aside.

The effect of such a combined approach is illustrated by simple, illustrative EU ETS price scenarios (Table 3). These results demonstrate the degree to which the combination of set-aside and RPA removes downside price risk, whilst delivering a stronger environmental outcome more robust against future uncertainties.

RPAs would not be quick to reach agreement on. A coalition of countries setting national price floors could emerge as an intermediate step to support the carbon price for investments in their countries, and this could strengthen the case for a Europe-wide agreement. This would to some extent mirror the way that the EU ETS itself was born, after the UK and Denmark had developed emissions pricing schemes, partly out of the desire to forestall a wider proliferation of national schemes.

## The international context

The EU ETS has been a cornerstone not only of the EU’s domestic effort to cap emissions and comply with its commitments under the Kyoto Protocol, but also of its international strategy more broadly. In this it has indeed played an important role.

It has given real credibility to the EU’s drive to help foster a more broad-based, global response. It has demonstrated that it is possible to establish cap-and-trade for industrial CO<sub>2</sub> emissions, and yielded many valuable lessons about design and implications. Amongst these, it has shown that so far, in all three phases it has been far easier to achieve the negotiated caps than initially expected, and shed valuable light on the practical economic implications for various sectors.<sup>28</sup> It has also been the major driving force of the Clean Development Mechanism, which despite its limitations has supported lower carbon investment across many developing countries and thus helped to engage developing countries actively in the climate change mitigation in ways that would have been inconceivable without it. With the recent fall in EU ETS prices, the price of CDM emission credits has fallen towards

€3/tCO<sub>2</sub>, rendering it virtually irrelevant in supporting the economics of low carbon investments in developing countries (Figure 1).<sup>29</sup>

Despite the USA not agreeing a Federal cap-and-trade scheme in 2010, the EU's exemplar has proved fruitful. States in the north-east of the USA established in 2009 a regional cap-and-trade programme for electricity power generation (the "Regional Greenhouse Gas Initiative", RGGI), while last year Australia and California both passed cap-and-trade legislation. Early in 2012, the Korean Parliament voted to do so, with bipartisan support making it likely the legislation will go through this year. At the last count, China is establishing thirteen pilot cap-and-trade schemes encompassing five provinces and eight cities, and covering an estimated 19% of Chinese emissions.

Perhaps having learned from the evolution of the EU ETS, both the Australian and Californian schemes are designed to give greater confidence for both investors and revenue applications, protecting against price uncertainties in the initial years of the scheme by establishing price corridor mechanisms (Figure 7). Just as the ETS demonstrated the feasibility of CO<sub>2</sub> emissions cap-and-trade, these newer schemes demonstrate the feasibility of mechanisms to address concerns about price uncertainty, and the conclusion that others reached about their desirability. The EU ETS is not alone in its need to address risk and uncertainty for investors in emissions pricing; in common with other schemes, the EU ETS needs to maintain the wider balance of environment and cost.

At present and forecast (without intervention) price levels, the EU ETS will have a much diminished role in terms of contributing to the EU's international financial commitments on climate change (either directly through offsets or indirectly as a source for public financial contributions); more broadly, it risks reducing the EU's profile and credibility in the international climate policy arena. An interesting additional feature is that the Australian price ceiling is set in relation to (\$20 above) the prevailing international prices. It remains to be seen how Australia will determine such an international price, but it would presumably take into account the ETS price. Conversely, the collapse of ETS prices to argue that Australia has stepped too far ahead and should weaken or abandon its system. These are additional, specific examples of how a stronger EU ETS could help to support stronger international action.

These are additional reasons for taking action, and for EU institutions to consider the lessons from the existing and other emerging schemes such as in the USA and Asia.

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<sup>25</sup> See <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-%2f%2fEP%2f%2fTEXT%2bIM-PRESS%2b20120227IPR39335%2b0%2bDOC%2bXML%2bV0%2f%2fEN>.

<sup>26</sup> See separate Annex for details.

<sup>27</sup> The Annex is published separately on the Climate Strategies' website

<sup>28</sup> See for example, the Climate Strategies report, "Ten Insights from the EU ETS", [www.climatestrategies.org](http://www.climatestrategies.org)

<sup>29</sup> For recent data and indication of issues see presentation by Axel Michaelowa to Climate Strategies seminar in Copenhagen, 19th January 2012, available from [www.climatestrategies.org](http://www.climatestrategies.org).

<sup>30</sup> For a recent fuller overview of existing and emerging international systems see Climate Strategies (2012): A. Tuerk, M. Mehling, S. Klinsky and X. Wang, Analysis and comparison of different kinds of carbon constraints, March 2012.

<sup>31</sup> The Australian CPM commences with a fixed price for three years and then moves to a price corridor for the subsequent three years, with the price ceiling defined as being AUD20 above the "international price"; in the diagram we have illustrated it as AUD20 above the floor price. For a fuller discussion on the Australian scheme see R. Betz, presentation to Climate Strategies seminar in Copenhagen, 19th January 2012, available from [www.climatestrategies.org](http://www.climatestrategies.org).

The Californian floor starts at USD10/tCO<sub>2</sub> in 2013, rising each year thereafter by 5% plus inflation. The price "ceiling" consists of a set of three tiered reserves (reserves created by set asides) Tier 1: 40\$ metric ton CO<sub>2</sub>e in 2013, rising each year thereafter by 5% plus inflation Tier 2: \$45 (ditto) Tier 3: 50 (ditto). For simplicity the diagram takes the central reserve level and also illustrates as linear.

The RGGI scheme was a much earlier scheme established amongst the north-east states of the USA, confined to electricity generators, and intended initially to give impetus to Federal efforts. It has a price floor, which despite being very low has proved important as this scheme (like others) has ended up with overall surplus. Without the price floor, prices would likely have fallen to zero (mirroring the EU ETS Phase I experience). Revenues from the scheme are used mainly to support energy efficiency programmes, and the price floor has protected the ability to plan and run such programmes. The RGGI experience has emphasised that even with a substantial surplus, there could still be trading at a price somewhat above the reserve price; with the RPA removing downside risk of buying (or holding on to) allowances, the prospect of high prices in the future thus has a much stronger role on the present price and trading activity even with substantial surplus.

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## CONCLUSIONS AND PROSPECTS

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It is well recognised (and was known at the time of adopting the Phase III Directive) that the linear reduction factor agreed in the EU ETS Directive was not sufficient to deliver long term climate goals. This level of annual reduction was a compromise, driven by concern about the possible costs of a more ambitious target, and hopes for a global agreement that could facilitate strengthening. Global negotiations have slowly moved forward: at the same time, the EU ETS is already achieving its quantity objective at far lower cost than projected. That underpins a generic case for moving the system closer to what is needed to achieve deep emissions reductions over the long term. There is also a value to predictability and stability, and finding the right combination and balance is key to the future of the EU ETS.

The European economic and political situation in 2012 makes it harder to build political support for far-sighted action on energy and climate policy. However, the move to greater auctioning in Phase III may help to focus political attention, and offers a mechanism for stability that was not previously available. Governments around Europe need revenue, and it is hard to budget on the basis of EU ETS auction revenues which are so uncertain (and which, without intervention, could fall further if economic conditions become even bleaker). Industry across Europe can also benefit from a more stable platform for energy sector investment.

A 'coalition' of national policies may be the most politically plausible outcome, but a European-level solution would help to simplify the diverse challenges faced in many countries. Core European countries thus have clear interest in co-operating to strengthen the ETS Europe-wide, rather than going their own way.<sup>32</sup>

An irony of the present resistance to considering price-related options is, of course, that the pressure to intervene comes from the fear of the consequences of prices being too low. As indicated, set-aside seems necessary to re-establish an effective market. The logical question in addition is whether it is a good idea to reach a European consensus (or compromise) on what policymakers consider to be "too low". If so, an RPA would underpin this, and also preclude the possible need for further market intervention.

As also emphasised, the ETS is not the only policy needed. Varied regulations and incentives around energy efficiency and renewables are necessary and have proven effective. The EU also needs urgently to start defining more clearly a vision and specific policies towards 2030. But the goals and instruments can and should be complementary. A strong EU ETS could provide funds for necessary investment in low-carbon energy supply and efficiency programmes. In combination with a stronger and more stable platform for energy investment, this has the potential to strengthen the European economy, not weaken it. A strong EU ETS could also help the EU maintain its leadership position in international climate discussions, building upon its success at the Durban climate summit.

This report's specific conclusion is that the EU ETS should be strengthened by accepting the combined importance of quantity, price, and foresight: by setting aside allowances, moving to set a reserve price on future allowance auctions, and launching negotiations on its framework to 2030. More fundamentally though, the EU should seize the impetus of the current crisis to not only set aside allowances, but also conduct a pragmatic and thorough assessment of all the options for reinvigorating the EU ETS and clarifying its enduring role in a wider, more integrated, European climate and energy policy.

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<sup>32</sup> For example, Germany has a need for auction revenues to help finance its ambitions in the energy sector, and the UK floor price could be disruptive if not set in a European-level solution. The core political challenge may be whether and how EU solutions can address also the interests and concerns of member states with emissions-intensive industry, particularly in eastern Europe. At the same time, eastern European countries will see reduced revenue from continued weakening of the EU ETS, particularly given the clause on 12% redistribution of revenues.

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