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Governing Carbon through the EUETS: Opportunities, Pitfalls and Future Prospects

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Key words: Energy Security; Low Carbon Innovation; Climate Action; EU Policy; EU-ETS

1. Introduction

The EU Emission Trading Scheme (EU-ETS) is the world's largest international scheme for carbon trading. Covering well over 11, 500 installations across 31 countries in Europe, the EU-ETS accounts for over 80 per cent of the global carbon market. The scheme is also the central climate-energy policy tool of the EU and key to the EU meeting its 20 percent emission reduction obligations under the international climate agreement. This chapter examines the performance of the EU-ETS as a financial platform for pricing carbon rights and as a tool for governing low carbon transition. We argue that despite certain weakness the EU-ETS has proven sophisticated and resilient as a market for pricing carbon. However, the scheme has proven very unsuccessful as a tool for tackling climate change and driving low carbon innovation.

Emission trading may well be an efficient tool for carbon regulation but the more grandiose assumption that the scheme is less immune to political tinkering or capture by business (than tax and CAC) is unfounded and even potentially dangerous. Moving forward, we recommend fundamental big structural reform, if the scheme is

to remain an effective driver of low carbon economy in the EU. The proposed structure is intended to eliminate the negative impact of politics and allow the EU-ETS to self-adjust to changes in the industrial production levels in Europe.

Europe has made heavy financial and political investment in curbing green gas emission through the EU-ETS. This investment and EU's leadership role is now being threatened by financial crisis and the poor performance of the EU-ETS in terms of driving low carbon growth. There is therefore an urgent need for a bold action to reposition the EU-ETS and for the EU to reclaim its leadership position in global climate action.

The chapter is structured as follows. In the next section, we examine the theoretical principles behind the popularity of cap and trade as the pre-eminent tool for carbon governance. In section 3 we examine the structure and the operating system of the EUETS. In section 4 we consider the question whether the EUETYS is actually work focusing first on its function as a trading platform and next on its role a climate mitigation and low carbon transition policy. In section 5 we propose solutions for restructuring the EETS to provide certainty and price stability relative to traditional financial trading regimes. In section 6 we make links with global carbon policy before concluding in section 7.

2. Market-Based Policies as Main Tool for Climate and Environmental Governance

In the 1970s and early 1980s, command and control (CAC) regulation, mainly through targets and performance standards, was the predominant method with which governments across the world sought to govern the environment. Although CAC remains a vital component in the regulatory tool box of governments in many

countries, there is wide and growing embrace of market based policies such as taxes and cap and trade as the preferred tool for environmental management. Although this claim is contested, CAC is generally associated with inefficiency and lack of flexibility (see for example Wagner and Keohane, 2008). Conversely, market based mechanisms are lauded for their flexibility and cost effectiveness (see for example Ekins and Barker, 2001).

An extensive body of both theoretical and empirical literature suggest that market-based policies can effectively lower greenhouse gas emissions given right policy design and implementation. Opinions however, diverge on which of the two key market-based mechanisms (carbon tax and emission rights trading) is a better policy tool for curbing greenhouse emissions and driving low carbon innovation (see for example Ekins and Barker, 2001; Hawksworth and Swinney, 2009).

An emission rights trading system is often seen as being significantly more of a market-based option than taxation . This is not a correct assessment as both are variations of similar components (see for example Ekins and Barker, 2001). Taxation allows policy makers to set a pre-determined price on carbon leaving market forces to determine how much of the commodity can be afforded by the participants. Thus, market forces still determine the volume of emissions at any given time period. With an emission rights trading system, government/regulators determine emission caps and the market sets the price in response to that cap (supply) and the demand for that finite supply. Thus while the policy makers set the price of polluting per unit and the market sets the quantity of emissions under carbon taxation, policy makers set the quantity of emissions and the market sets the price of polluting per unit under emission rights trading.

Although, as stated neither a tax regime nor cap and trade can be truly considered as being a more market based approach than the other, emissions trading has become the more popular of the two as the key policy instrument for climate change response especially in industrialized countries. Perhaps the most important factor is the relative ease in selling the emissions trading to businesses, when compared with prospect of further taxes. In fact in the case of the EU, the business lobby was active in campaigning for cap and trade and very instrumental in making the EU to switch its initial preference away from for carbon tax towards a cap and trade regime. Political and institutional hurdles against cross border tax were also important factors (Braun, 2009).¹

Emissions trading was established as a viable policy instrument by the work of Montgomery (1972). Employing a static framework under perfect market conditions, one he showed that, for participating firms within an emissions-constrained economy, there is minimum cost equilibrium. Employing optimal control theory, Rubin (1996) shows that the equilibrium price for a unit permission to pollute (emission credit) corresponds to the costs due to marginal abatement measures if firms are allowed to bank and borrow emission permits i.e. with no inter-phase restrictions (see Springer, 2003 for a review of results gathered from 25 models on marketable emission permits). Emissions trading can therefore provide the means for businesses to fund emission reduction programmes via the sale of excess permits accumulated through investing in emissions abatement measures. Thus firms are able to reduce emissions by applying the most economical means of doing so. In this case, there will be no unique loss of profitability since all firms operate within the same emissions-constrained environment.

¹ In the EU, a taxation treaty requires unanimous vote from all member states, whereas for a trading treaty like the establishment of the EU-ETS, only a simple majority is required. Thus, politically, emissions trading prove an easier sell.

Market-based policies have not only been theoretically proven to be effective as wealth preserving mechanisms in an emissions constrained economy, but there are also pieces of empirical evidence showing them to be more efficient on the long run (see among others Carlson et al., 2000; Stavins, 2005). Under the United States Acid Rain programme implemented in 1995, an estimated US\$250 million annual savings were made in contrast to the command and control system (Stavins, 2005). Carlson et al. (2000) reports that annual estimated savings of about US\$1 billion were made under the programme in comparison to savings that the direct regulation alternative would have afforded. It was also reported that sulphur dioxide emissions by electricity producers in the United States declined by more than 35% to 10.2 million tonnes in 2005.

However, many advocates of emission trading have often underemphasized the undergirding policy and political requirements needed for emission trading to function effectively. In particular the notion that emission trading or market mechanisms are apolitical or neutral instruments, which results in equitable distribution of benefits and risks has been thoroughly debunked (ref). Moreover, questions have now arisen about the ability of cap and trade regimes to move beyond proving platform for assigning emission rights toward driving low carbon innovation. It is apparent that the EU-ETS has not driven low carbon innovation. While some continue to insist that the problem is about design and implementation, others suggest that the problem is more fundamental in nature.

3. The EU-ETS: Structure and Operation

The EU-ETS was the main policy plank for achieving the EU's commitment to reduce its emissions by 8% below the 1990 levels in line with its commitment in the first

phase of the Kyoto Agreement. The EU has subsequently extended the scheme to 2020. The EU-ETS operates as a compulsory pseudo-cap and trade scheme where participating installations have a legal requirement to lower their emissions in accordance to set caps or buy emissions permits to offset exceeding the set caps. There is a direct 'link' between EU emissions and global climate policy, essentially ensuring that emission credits from the Kyoto project-based mechanisms such as the Clean Development Mechanism (CDM) and Joint Implementation (JI) can be submitted in lieu of emission reductions towards the EU's reduction target (see Flåm, 2007). The use of project emission credits has already become quite controversial with questionable allowances being dumped on the market. The EU Commission has however responded by invalidating the use of certain credit types.

The design of cap and trade is based on regulating aggregate emissions by putting a price on a target gas. As stated, the theory is that the regulator would decide only a cap while the market decides price on the target gas based on scarcity forced by the regulator's cap (supply) and aggregate demand for right to emit the gas. This would imply that in such a scheme, the regulator is not directly responsible for fixing the price of emissions. However, in practice regulators can and do influence the pricing of the targeted gas through the introduction of policies (see for example Hintermann, 2010; Alberola et al., 2008). For example, a percentage of emission allowances can be held in reserve allocated thereafter in order to influence prices.

Market fundamentals, such as supply and demand forces and sometimes, exogenous shocks are essentially responsible for setting the price of emission. Permission to emit the regulated gas is issued as allowances. The issuance of the allowances can take the form of free allocation based on historical emissions patterns of an industry (grandfathering), through auction or a combination of both to any

degree. The companies and installations involved in this scheme reserve the right to trade their emission allowances, giving them market based options on meeting the volume targets set by the regulator. A company can be a net seller if it finds it to be more cost effective to reduce emissions than to buy allowances; it can then sell off its surplus allocations to participants with excess emissions. On the other hand, if purchasing allowances improves firm competitiveness, the firm may opt to be a net buyer (see Boemare and Quirion, 2002; Böhringer and Lange, 2005).

The use of permit trading is not novel to the Kyoto Protocol or the EU-ETS. Until quite recently, the most prominent example of emissions permit trading had been the United States Acid Rain programme. The Environmental Protection Agency (EPA) has employed emissions trading as a policy tool to achieve emissions reductions since 1992. There is no shortage of publications examining the operational value of this programme with most concurring on its success (Albrecht et al. 2004; Joskow et al. 1998). A fundamental difference between the SO₂ market and the EU-ETS is that in the former allowances are traded as spot, forward and options, underscoring its liquidity while the latter has never restricted banned intertemporal trading.

3.1 Trading in the EU-ETS

According to the World Bank, in 2011, more than €122.3 billion worth of transactions were executed in the EU-ETS (see Kossoy and Guigon, 2012). The European Climate Exchange (ECX) platform is the market leader in the EU-ETS exchange-based carbon trading, with more than 92% traded market share. It is a derivatives platform, but has recently introduced ‘daily futures contracts’, with the goal of taking a share of the spot market. The regular futures contracts are marketed on a quarterly expiry cycle:

March, June, September and December. However, most of the trading activities have consistently occurred in its annual (December) maturity contracts (Ibikunle et al., 2013).² While the ECX is a derivatives platform, others, such as NASDAQ OMX, trade spot as well. Most platforms trade in Carbon Financial Instruments (CFIs) other than the more voluminous EUA-based CFIs; for example, there are Carbon Emission Reduction (CER) and Emission Reduction Unit (ERU)³ derivatives, and spot trades as well. Recently, following the inclusion of the aviation industry in the EU-ETS, platforms such as the ECX have introduced aviation emissions offset-based CFIs. These events and numbers suggest a scheme that is quite successful in attracting trades, thus indicating a measure of investor/participant confidence. This is important because traders are usually only attracted to markets that can efficiently price instruments.

4. Does the EU-ETS Work?

The question about whether EUETS is fit for purpose has vexed scholars and policy makers alike especially following the recent financial crises and the collapse of the carbon price. We think that this controversy in part resides in the failure to distinguish between two different if related objectives of the EUETS. The one is its role as carbon rights assigning and trading tool. The other is its role as a tool for driving low carbon innovation. We shall try to make this distinction clear in preceding section.

4.1 A Rocky but Resilient Trading Platform

² See <https://www.theice.com/productguide/ProductSpec.shtml?specId=197#> for all ICE ECX contracts specifications.

³ CERs and ERUs are project-based emission credits, allocated on the basis of emission reductions achieved from a low carbon project.

Butzengeiger et al. (2001) identify two critical circumstances that must prevail for an ETS to be effective (efficient). The first condition is theoretical pertinence: there should be diversity among industries involved in the scheme. This is important in order to encourage trades in allowances as benefits can only be achieved if all involved participants face differing abatement costs. The likelihood of this is slimmer if they are all members of the same industry with similar production requirements and seasonal variations in demand of their products. The second condition, and perhaps the more important consideration, is the need for liquidity in the system. The scheme must involve a sufficient pool of participants to ensure a necessary volume of transactions. When there is a constant availability of volumes to match the supply and demand needs of participants, an efficient system develops. This also results in the emergence of an explicit price signal to the market. The stated price signal in this sense refers to the price discovery process, which is critical to the functioning of the market. The degree to which one can rely on the price discovery is the measure of a market's efficiency. Thus, if the EU-ETS will be positioned as the driver of the EU's climate change policy then the price signalling must show evidence of a high level of market efficiency (informational price efficiency).

Ibikunle et al. (2013) infer relative market efficiency from informational efficiency of the intraday price discovery process on the ECX during the 2009 compliance year. Having shown that intraday evolution of market efficiency is related to trading activity, they do not link long-term market efficiency to the liquidity of instruments unlike Ibikunle et al. (2012) does. The contributions of both studies strongly suggest that the EU-ETS efficiently incorporates information into the price of carbon financial instruments on an intraday basis. Indeed the studies point to one fact: the EU-ETS, as a financial platform for pricing emission rights, is working- at least in

pure market terms. The question of whether the EU-ETS can continue to serve as the EU's central climate change policy instrument is thus answered to some extent. However, the EU-ETS was established to induce low carbon innovation in the EU, and on this score, the answer is no longer affirmative.

4.2 Price Volatility and low carbon innovation

It is common knowledge that the current sovereign debt crisis and the general decline in industrial production levels in Europe have rendered the previously set emissions cap rather irrelevant.

The first set of emission verification results for the EU-ETS was not released until 2006; hence there was no way of telling if the scheme had reined in emissions. The deadline for submission of allowances by April 30th 2006 drove EUA prices up beyond the €20 mark by the autumn of 2005, and to nearly €30 by the middle of April 2006. This effectively decoupled allowances price from energy commodity prices. At this point, it seemed the design of the EU-ETS had worked according to the expectations of the policy makers; the carbon price was high enough to drive low carbon innovation. However, reports released between April 25th and May 15th 2006 confirmed the fears of over-allocation of EUAs by EU member states and, as a result, the price of EUAs plunged to less than €10 within 48 hours. This drop in price due to over-supply is not unlike what the market currently experiences. The market did rally in 2006 after the initial disappointment; even today, the reason for the price rally remain unclear ([see Nicholls, 2006](#)). It is possible that the return of relative confidence to the market was spurred by the realisation that, although the EU-ETS

EUA allocation was net long, EU emissions had declined over the same period⁴. This buoyancy did not endure for long and prices started to plunge again later in 2006. The price collapse of April 2006 and the price collapse starting in September 2006, which lasted until the end of the trial phase in 2007, seem to constitute the strongest argument in favour of the use of carbon tax as an abatement strategy rather than a cap and trade approach. Tax regimes arguably offer more price stability. A point that cannot be overlooked is that the extreme volatility experienced in the EU-ETS was in the trial phase (2005-2007), during which there was a ban on intertemporal trading. It is believed that this induced some of the off-loading actions of allowance holders towards the end of 2006 and in 2007.

Looking forward, the EU-ETS was expected to deliver about 2.8 billion tonnes of emission reductions against the business as usual projections over 2008-2020. However, as a result of recessionary effects, projections show that emissions in the EU are in line to decline by as much as 3.5 billion tonnes over this period without the influence of the EU-ETS (Morris et al., 2013). In 2008, transactions on the EU-ETS were valued at US\$101.49 billion (€74.56 billion) representing an 87% growth rate on the previous year, with more than three billion EUA (one EUA represents one tonne of CO₂) spot, future and option contracts traded. In 2008, the recession in Europe forced significant reduction in demand for major commodities such as housing, cars etc. This resulted in a lower demand for cement, steel and other raw materials. Consequently manufacturing and building projects stalled, leading to lower energy consumption. The need to purchase EUAs is based on energy/power consumption and, as power consumption dropped, the demand for EUAs declined. This led to a sharp drop in carbon prices. The spot price during the year plunged 75% over a period

⁴<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/612&format=HTML&aged=1&language=EN&guiLanguage=en>

of 8 months from a record level of €28.73 in July 2008 to lowly €7.96 on February 12 2009 (see Capoor and Ambrosi, 2009).

Since current level of actual emissions reductions in the EU are mainly due to the recession and over supply of allowances, and the EU-ETS being an efficient pricing mechanism, the prices of carbon allowances on EU-ETS platforms have fallen significantly over the past year. In July 2013, one EUA traded for as low as €4.37 on the ICE/ECX EUA December 2013 maturity contract, down by more than 85% from an earlier high of about €30 in 2006. Also for the first time since its inception in 2005, the value of traded carbon in the EU-ETS fell by about 35% to €62 billion at the end of 2012. However, in testament to the endurance of the EU-ETS, the volume of traded carbon instruments still grew by 28%, primarily driven by EU-ETS trades. The carbon price in the EU is not being depressed by gains from other climate action programmes, but by the significant drop in European industrial production levels leading to surplus allowances being dumped on the market. Thus, if the glut is contained, relative scarcity will be restored and the prices will climb up again. Higher prices are needed in order to encourage firms to invest in low carbon technology and production processes; the current price levels do not satisfy this need. Hence, until structural changes sufficient to maintain the “right” carbon prices are made, it is not likely that the EU-ETS can meaningfully fulfil its purpose as a driver for low carbon transition. Whether continental and international politics would permit such fundamental change may be the biggest question facing EU and global climate governance.

4.3 Arbitrageurs in the EU-ETS

Established platforms in the EU-ETS, such as the ECX, enjoy high levels of market liquidity as a result of high volume of transactions. This liquidity, as explained, is vital for price discovery. And most of that liquidity has been supplied to the market by value seekers/arbitrageurs (not the expected compliance traders, for whom the scheme was established) via derivative trades. Since inception, futures trading has accounted for the bulk of transactions in the EU-ETS. For example, in 2009, 73% of all transaction value was in futures and approximately 5% in options while spot trades accounted for only 23% of the total volume of trading value. This is even more remarkable considering that in 2009, spot trades recorded a year on year increase of 450% (Kossoy and Ambrosi, 2010). Daskalakis et al. (2009) examined why derivatives are so dominant in the EU-ETS, especially since derivatives only develop as extensions of the underlying security in financial markets. Since under EU rules, EUAs are needed for submission only once a year, there is therefore little advantage in investing in them for keeping for the whole year. However, one can take required positions in the futures market during the year and switch those positions as EUA requirement projections shape up. This kind of flexibility is easier to achieve with derivatives trading rather than spot, even though there is no actual 'physical' storage of EUAs involved. One further reason is that, in commodities markets, derivative trading has been known to mature quicker than trades in the underlying itself. Questions have been asked as to the need for the presence of non-compliance investors in the carbon markets, especially in the EU-ETS since they are only in it to seek value. The questions are akin to those being asked about the need for high frequency traders in financial markets in general (see Diaz-Rainey and Ibikunle, 2012). Both of these classes of traders in the respective markets help improve market sophistication with their trades and therefore aid in providing the much-needed

liquidity for the market. Without the arbitrageurs in the EU-ETS (see Ibikunle et al., 2012), price discovery will not have reached the levels the market currently enjoys. Thus, while much need to be done to ensure that market abuse is kept to the barest minimum in the EU-ETS, non-compliance investors are needed to ensure the functionality of the market.

5. Prospects for Repositioning the EUETS

The preceding sections suggests that while the EU-ETS efficiently incorporates all available information into the prices of carbon financial instruments in the EU-ETS, the current prices however are not sufficient to drive low carbon innovation. As curbing emissions and driving low carbon transitions are the main purpose for setting up the EU-ETS, one is tempted to conclude that the EUETS is not fit for purpose. Given that the EUETS remains the flagship energy and climate policy of continental Europe serious consideration needs to be given to how to reposition it to fulfil the fundamental objectives for which it was established. We propose two steps. The first is the setting up of an independent authority to ensure price stability within the EUETS. The second is greater policy harmonization across Europe to reduce complexity, tensions and redundancies.

5.1 The Independent Regulatory Authority

For the EUETS or any other greenhouse cap and trade regime to drive low carbon innovation policy certainty and having the “right” price of carbon are essential. We saw that in theory, the market is supposed to function independently to ensure that the

price of carbon is correlated to the marginal costs of abatement of greenhouse gases emissions reduction. However, the reality is often more complex. Market frictions and exogenous impacts such as policy tinkering readily complicate the pricing of carbon, especially if the commodities being traded are derivatives of the permit (see Ibikunle et al., 2013). In standard financial markets, interest rate decisions and quantitative easing by central banks can be viewed as exogenous events in the market designed to elicit desired reactions. Given the position of the EUETS as a central policy tool for climate and energy governance within the EU and beyond, an authority akin to a central bank with corresponding policy levers are sorely needed right now to force the carbon prices back-up and restore the EU Climate and Energy Package agenda to the right track. The EU Commission has already recognised this to some extent and subsequently proposed *backloading* a significant proportion of EUAs. The backloading proposal, if eventually implemented will delay the auctioning of up to 900 million EUAs until the European industrial production levels improve.

The backloading is a step in the right direction. However, it is by no means a long-term solution. The piecemeal episode-by-episode approach favoured by the EU in tackling EU-ETS problems cannot subsist for much longer without hurting the operational integrity of the trading platforms, thus we propose a solution to the chaotic policy formulation apparatus.

Our proposal is hinged on monetary policy theory and more specifically on the Fisher (1896) relationship linking the real rate, expected inflation, and the nominal rate of interest. Given that emissions caps and auction prices (in this case may be viewed theoretically as the nominal interest rate-equivalent) have important implications for emission credit aggregate price; we consider the setting up of an independent EU-ETS authority as being of critical importance. This suggestion is

further underscored by the need for market confidence in the EU-ETS. At present, market participants have reduced confidence in EU policymaking regarding the EU-ETS given the seemingly chaotic nature of the process. The process is overly political with more weight given to individual state interests than the overall health of the EU-wide emissions-constrained system/economy. Moreover, the system has proven vulnerable to capture with some companies recording substantial windfall profit in the first and second trading period (see for example Daskalakis et al., 2011) . To restore confidence in the EUETS, the sustenance and economic viability of the market should be the driving force for EU-ETS policy making since the policy to create the emissions-constrained economy has been adopted as the major plank of EU energy agenda.

However, one must concede the difficulty of ensuring this under the current policy formulation structure of the EU. Giving EU Parliament and the EU Council voices in EU-ETS policy formulation will continue to threaten the functionality of the market. An independent policymaking authority set up to ensure price stability is hardly an innovation; it is already working well for developed economies around the world. What we propose for the EU-ETS is a similar independent authority set up to ensure price stability of the EUA within the EU-ETS. The overriding goal of the agency should be to ensure that price of emission permits stabilise over a benchmark that can encourage low carbon innovations. The remit of the agency should be two-fold: policymaking and commercial/trading regulation. Thus the agency should set emission caps at all levels and manage auctioning of emission permits. The agency will also be responsible for regulating all platforms trading in EUAs, EUA-based derivatives and other linked products in the EU. We believe that such an independent agency is vital to achieving the goals of the EU-ETS.

The merits of setting up the authority proposed above include the de-politicising of the EU-ETS policy making, this we contend, should restore the confidence of the market in the EU-ETS as a driver of low carbon innovation. Knowing that the price of carbon permits will be stable for the foreseeable future will unlock investments in low carbon innovation projects and help the EU achieve its target of achieving a low carbon economy as set out in the Energy Roadmap 2050. Of course there are potential problems associated with tasking an independent apolitical body with implementing political decisions, but that is what central banks around the world do. Further, one can extend this argument to the civil service implementing decisions made in parliament by partisan politicians- this works quite well in most democracies. Thus, while there may be unforeseen risks associated with de-politicising the EU-ETS, the benefits do outweigh the risks. And should the politics of the moment change, giving way to new EU priorities, an amendment to the legislation setting up the independent authority will simply need to be made.

5.2 The Imperative of Policy Coherence

The drive to create a low carbon economy in Europe does not suffer from shortage of policy initiatives. Our survey of energy efficiency incentives in the United Kingdom and Germany reveals that both countries each have in excess of 95 of such initiatives on their books. Based on our observation, a number of these initiatives seem to be mere duplication of others and some actually suffer from lack of efficient implementation (see for example Grubb and Wilde, 2005). Administratively and financially, a lot could be gained by streamlining all energy-climate action related policies at regional level in order to deliver economies of scale advantages. There is a need to ensure a stronger level of coherence in climate action instruments deployment

within the EU. This level of coherence is lacking right now as each member state struggle to implement its own initiatives. It is instructive to note that these initiatives are usually tailor made to the central EU policies. It is therefore not clear why these initiatives/mechanisms cannot be developed and administered at EU level. Integrated EU-wide mechanisms would of course have to be made flexible enough to allow for the impact of country-dependent effects – as is already the case in many other issues.

Another perspective one can take with regards to developing coherent policies is that within the current scheme of things, whereas there are EU-wide policies such as the EU-ETS running alongside national policies, conflicts may arise. For example, the EU-ETS operates as a market mechanism that allows market forces to determine the price of emission permits with little to no influence from policy makers. Now consider the decision of the UK government to introduce a carbon price floor plan. This member state policy has not helped to bolster carbon price in the EU-ETS, but it may end up putting UK industry at a strategic disadvantage. However, it is expected that the revenue gained from the policy will be deployed to compensate those that would be adversely affected. Consider also that a lot of savings in energy can be made through the introduction of energy efficiency initiatives targeted at both firms and households. There is a chance that gains delivered by these initiatives could potentially depress allowance prices in the EU-ETS. Now the EU-ETS exists to put price on carbon and thereby create an emissions constrained environment, which will in turn encourage firms to invest in low carbon production processes. However, in the event that other initiatives at national or EU-level deliver efficiency gains, there arises less need for emission permits thus depressing carbon allowance prices. Climate action-energy policy formulation must therefore develop at a strategic level with the policy makers having an over-arching view of the entire process as it affects each

existing or planned initiative/mechanism. As it is right now, the climate action-energy agenda in Europe seems quite rudderless with little synergy among the hundreds of existing or planned initiatives. The Commission, Parliament and Council must now show considerable restraint in proposing and establishing new EU-wide policies, member states must do likewise. All parties should carefully evaluate the impact of all new initiatives on existing ones across the economic bloc before proposing/implementing new ones. If this can be achieved and enshrined in the legislative processes across all member states, policy instruments will complement one another. This is important in ensuring an efficient and effective climate action programme that will help strengthen Europe's energy future and economy going forward.

The concerns related to achieving effectiveness of policy instruments through coherence and ensuring that new policies emphasise existing ones are not limited to EU-based policies. The EU's adoption of global legally binding treaties such as the Kyoto Protocol also needs to be duly considered in drawing up climate action programmes. Consider a recent report from the UK based NGO, Sandbag (see Morris et al., 2013). According to the report, having being significantly damaged by recession, the EU-ETS (discussed extensively in section 4) is now responsible for cancelling out nearly 700 million tonnes of CO₂ savings from other EU climate action policies through storage of those allowances as banked carbon permits. This has exacerbated by the lax regulation of Kyoto project based allowances. An increasingly significant proportion of these project allowances are dubious and should not have been admissible in the EU-ETS.

6. Global Dimensions

Inertia has set in into international climate action negotiations in recent years since the ill-fated Copenhagen Conference of Parties (COP) in 2009. This was expected if one considers that the EU, which until now had been leading the charge for comprehensive legally binding international action on climate change, has been embroiled in significant regional economic problems in the aftermath of the sovereign debt crisis. However, there appears to be some hope reviving signs across the globe. Recently, President Obama of the United States appeared determined to pluck climate action from the obscurity it had recently been consigned, and place it once again onto the centre stage of international diplomacy.⁵ By stepping out to shadows to outline his administration's plans for meeting America's commitment to cut carbon emissions by 17% below 2005 levels by 2020, Mr Obama helped puncture the argument that Europe, by seemingly going it all alone, was hurting its own economy. Mr Obama's plans, restricted by lack of support from his country's congress, contain mainly measures that aim to limit CO₂ emissions from power plants. Power plants are responsible for more than a third of America's greenhouse gas emissions and their regulation should help meet the 2020 and future targets as well as spurs the growth of low carbon investments in the United States.

Even before Mr Obama's speech at Georgetown, several Annex I and non-Annex I countries have started taking action on climate change. About a week before the American President's speech, the first of seven Chinese pilot emissions trading schemes started trading in Shenzhen. The commencement of the pilot scheme reinforces the Chinese government's commitment to reducing carbon intensity by 40-45% below 2005 levels by 2020. China is the world's largest emitter of greenhouse gases ([Minx et al., 2011](#)), therefore the Chinese government's commitment to cutting

⁵ Speaking to a crowd of students at Georgetown University on 25th June 2013, he said "I refuse to condemn your generation and future generations to a planet that's beyond fixing."

down emissions and providing leadership on low carbon technology and investment is most welcome. The governments of Australia, New Zealand, California (largest state in the United States) and South Korea are few of the other entities that have already taken up climate change-related legislation. Thus, whence there is no doubt that Europe has invested most in curbing emission of dangerous greenhouse gases, others are beginning to step up. The inertia that has recently set in on the part of political leaders should be disposed with in time, as the economy grows stronger. In the meantime however, the EU needs to look forward to the future of its climate change policy, which is intertwined with its overall energy policy.

7. Conclusion

The European Parliament and Council have both endorsed a principle to reduce greenhouse gas emissions in the EU by 80-95% below 1990 levels by the year 2050. These endorsements somewhat controversially have been based on an international effort sharing table included in the Intergovernmental Panel on Climate Change (IPCC)'s Fourth Assessment Report (see Morris et al., 2013). The EU's Energy Roadmap 2050 is based on the adoption of this target. Further, the G8 leaders have endorsed a greenhouse gas reduction target of at least 80% below 1990 levels. It does seem then that there is a growing consensus for this target range. These targets are commendable given the urgent need to address climate change.

However, in addition adopting laudable targets, Europe now needs to closely examine its policy tools and implementation approaches to ensure they are fit for purpose. It is fair to say that EU-ETS has proven to be quite a defective piece of policy so far. Essentially the functionality of the EU-ETS is being impaired as a result of the drop in levels of economic activity in the EU- something that was not

considered in drafting the package. This is despite the fact that recessionary effects were already been experienced at the time of passing the legislation in late 2008. Going forward, radical structural changes are required to reposition the EU-ETS and restore it as a frontline policy for curbing emissions and driving low carbon innovation. To this end, it is important that long term ambitious targets are coupled with medium and short term reviews needed to ensure investments from the private sector. Such measures will ensure that investing firms will have the confidence of a stable policy environment while also receiving assurances of short term fixes if they become necessary.

The idea of providing long term targets but also retaining short term-based instruments to ensure that those targets are achieved is not unusual in macroeconomic planning. Indeed, this method is not unlike the Federal Reserve or the European Central Bank (ECB) setting a long term inflation target, then tinkering with interest rates and other mechanisms in order to achieve the inflation target. There are bound to be short term exogeneity-induced fluctuations such that volatility takes hold in the market for short periods. However, if the instruments are well applied, such volatilities should be short-lived. Identifying the right policy instruments akin to fiscal policy ones used by central banks and incorporating enough flexibility to ensure their effectiveness are the critical issues to consider here. The EU needs to eliminate the temptation for political considerations or correctness when wielding these instruments. Thus, as in the case of central banks, an independent authority should be responsible for overseeing the implementation of the targets/energy-climate change policies once they are enacted. A move like this coupled with EU-wide policy coherence will ensure strong investor confidence that will lead to growth in investments going forward.

Even so, it would be necessary that other political jurisdictions, especially US and China step up to take comparative climate reduction burdens. Until quite recently, the EU has shouldered most of the burden for climate action, while the US, which is a far bigger greenhouse gas emitter, has done far less. This increases the threat of carbon leakage and loss of competitive edge by European firms (see Barrett, 1998). Continued unilateral action on climate change beyond 2020 could therefore potentially undermine Europe's economy. However, cost savings from energy efficiency projects and the possibility of gaining first mover advantage can offset the costs of carbon leakage and temporary loss of competitiveness as energy security assumes a significant dimension in the coming decades. Already, China is looking to benefit from a first mover advantage by making major low carbon economy investments.

Beyond the first mover advantage, which may not become apparent in the short to medium term, and energy savings advantages, reduced exposure to energy costs volatility against the backdrop of energy security issues is also a significant rationale for the sustenance of an emissions constrained economy in the EU. This however still needs to be balanced against the drawbacks associated with climate action, such as loss of industry competitiveness.

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