CLIMATE POLICY

Reforming emissions trading

Courageous steps are required to reform the European Union Emissions Trading Scheme. To this end, an independent carbon authority has been proposed — this is a move in the right direction, but should be part of a much broader discussion about reforming emissions trading.

Ottmar Edenhofer

The European Union (EU) Emissions Trading Scheme (ETS) is the centrepiece of European climate policy. However, its performance is currently under great scrutiny. Many believe that the carbon price it sets does not provide the correct incentive for long-term investments in low-carbon technologies. Certainly, the current emissions price — between €5 and €6 per tonne of CO_2 (Fig. 1) — is far too low to incentivize a switch from coal to low- or zero-emission alternatives. Actually, the consumption of hard coal has been increasing in Europe since 2009[1]. Despite the limited success so far, carbon pricing remains essential for any ambitious climate and energy policy, particularly if the proliferation of coal is to be addressed. Writing in *Energy Policy*, de Perthuis and Trotignon[2] identified "market fundamentals" as drivers of the carbon price decline. Most importantly, they claim that the deterioration of economic conditions since the 2008 crisis should at least partly explain the low carbon price. Additionally, renewable support schemes and the inflow of carbon credits are blamed for a further price decline[2,3]. During the period 2008–2013, European carbon emissions were consistently below the annual caps set by the EU ETS. Thus, the cap was temporarily non-binding and a large surplus of allowances was generated. Given that the annual caps have not been binding, it is unclear whether market fundamentals can fully explain the carbon price decline. The EU ETS is an intertemporal trading scheme, therefore, in times of non-binding annual caps (such as in recent years) carbon prices should reflect expectations of future allowance scarcities, which are subject to the credibility of politically envisaged long-term emission targets.

A recent study carried out by Koch *et al.*[4] showed that the global economic recession, renewable support schemes, the inflow of carbon credits and gas and coal prices can only explain about 10% of the price decline in the EU ETS over the period 2008–2013[4]. Thus, the question of what drives the price of allowances at times of temporarily non-binding caps remains unanswered. Koch *et al.*[4] suggest that EU policymakers have destabilized the long-term expectations of investors. In particular, the announcement of back-loading (that is, delaying the auctioning of allowances to stabilize prices) and a number of structural reforms to strengthen the EU ETS were apparently not perceived as credible by investors and traders. The low price of futures contracts for the year 2020, shown in Fig. 1, indicates that traders anticipate only a modest long-term scarcity of emission permits in the market. As such, neither back-loading nor the structural reform proposals seem to have significantly changed long-term expectations.

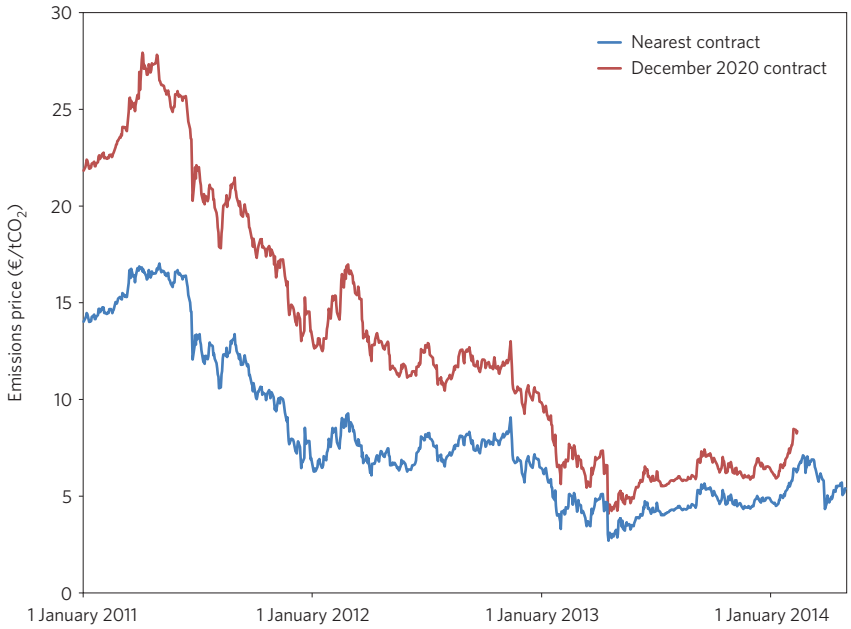

Figure 1 | Price paths of European emissions allowance (EUA) futures contracts traded on the ICE European Climate Exchange. The nearest contract (blue) is the EUA futures contract, expiring in the month ahead. The long-term contract (red) will be settled in December 2020. The price of emissions is displayed in euros per tonne of CO_2 (€/tCO_2). Data taken from ICE Futures Europe (https://www.theice.com/futures-europe).

Investors doubt that a sufficiently tight emissions cap after 2020 will be sustained. In its recent proposal for a 'market stability reserve', the European Commission only offered to partly reduce the oversupply of allowances by moving it temporarily into a reserve, until it is released again in the future (http://go.nature.com/nDyx78). It is doubtful that this measure will enhance credibility, especially as its effect on price remains unclear.

The perceived lack of long-term credibility has serious implications. Current prices do not signal that there will be a scarcity of allowances in the long term as a result of stringent emissions caps. Therefore, firms under-invest in low-carbon technologies. A low price in the short term has long-term consequences — coal-fired

plants in Europe will become even more competitive, locking in carbon-intensive infrastructure for decades to come.

To address these concerns and reinforce the credibility of long-term targets, de Perthuis and Trotignon[2] call for a fundamental reform of the EU ETS. They propose an Independent Carbon Market Authority (ICMA) to manage — and adjust when needed — the long-term supply of emissions allowances and the timing of the auctions through which allowances are sold in the short term. Long-term supply adjustments would imply a reduction of the cap, for example, when renewables are pushed into the market through additional subsidy schemes by some EU member states. It also means a reduction of the long-term cap when international carbon credits are flooding the market. This proposal aims at establishing an independent body with a well-defined mandate and clear rules of accountability that are intended to enhance long-term commitment and credibility, eventually leading to efficient price signals in the short term.

However, the idea of an independent body tasked with adjusting long-term emissions caps is the Achilles heel of the proposal because it is improbable that politicians will delegate decisions about the ambitiousness of climate policy to an independent body of experts. As already highlighted, the mandate of ICMA would require adjusting the cap if and when the deployment of renewables is increased through additional subsidies, thereby leading to a decline of allowance prices. But a country (for example, Poland) would hardly accept a tighter cap because of the increasing share of renewables in a neighbouring country (such as Germany). Therefore, the proposal by de Perthuis and Trotignon[2] faces substantial practical and political difficulties. Not only will it be difficult to establish the institution because of prevailing fundamental political controversies, but there will always be the risk that future policymakers will change its mandate, undermining its credibility[5].

Despite the potential barriers, the idea of establishing an independent body has merit. The researchers analyse the challenges of defining the mandate of the proposed body with sufficient detail to possibly dissuade some of the political hurdles. Still, a much broader and open discussion of the EU ETS reforms is required, which include the expansion of sectoral coverage, the recycling of the revenues obtained by auctioning the allowances, the potential role of a price collar setting a minimum and a maximum carbon price and burden-sharing schemes. There are currently only a few comprehensive proposals that address all of these problems with the aim of establishing the long-term credibility of European climate and energy policy.

It is encouraging that the correct topics are being discussed. Without intelligent proposals for institutional design that include courageous steps for implementation, and a general openness to new ideas by all stakeholders, the EU ETS is at risk to fail permanently. If the EU intends to continue acting as a leader in climate and energy policy, failure of the ETS is not an option. ❐

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ATMOSPHERIC SCIENCE

Quiet weather, polluted air

Severe air pollution episodes are caused by certain types of weather. Now, research suggests these meteorological conditions will become more common due to climate change.

John Dawson

Most of the discussion about climate change and climate extremes focuses on dramatic events, such as floods, droughts and record high temperatures. Stagnant, fair-weather conditions are not usually thought of as extreme — after all, warm, stable atmospheric conditions generally lead to pleasant weather. However, a different viewpoint is required when considering the meteorological drivers of pollution episodes, including stagnation. A warm, stagnant high-pressure system may not fit most definitions of hazardous weather, yet stagnation leads to air pollution extremes. As they report in *Nature Climate Change*, Daniel Horton *et al.*[1] suggest that changes in the climate over the twenty-first century will lead to a considerable global increase in the stagnation events that are partially responsible for air pollution episodes.

Although emissions are the most important determinant of air pollution concentrations, meteorology plays a major role in determining whether or not an air pollution episode occurs. For example, a strong correlation has been established between the stagnant atmospheric conditions associated with the Bermuda High weather pattern and high ozone concentrations in the eastern US[2]. Similarly, ambient concentration of $PM_{2.5}$ — particulate matter with diameter 2.5 μm or less — was calculated to be 2.3 μg m^{-3} greater on stagnant days than on non-stagnant days in the US[3]. This effect would presumably be even more pronounced in areas with less robust emissions control programs. Additionally, analysis of historical meteorological data from several decades suggests that the increasing frequency of stagnation in the