

in brief...

# Designing carbon markets that deliver change

Ever since the European Union created its market-based carbon policy, governments and businesses have been keen to assess its impact. **Jonathan Colmer, Ralf Martin, Mirabelle Muûls and Ulrich Wagner** explain why analysing the effectiveness of such policies can be complex – and why hard proof that carbon markets can achieve what they set out to do is scarce.

The EU's emissions trading system, which was launched in 2005, was designed to encourage firms to innovate in how they limit the carbon pollution that they produce. Under the policy, firms buy a tradeable permit per tonne of carbon they emit.

Through detailed examination of industrial data, our research shows that creating a European carbon market prompted an overall fall in emissions of 14%-16% over an eight-year period, equivalent to 5.4 million tonnes of carbon each year – without any dent in firms' performance.

This is proof of success – carbon markets charge companies for the amount of carbon dioxide they emit – with a view to discouraging dirty and polluting industry and encouraging firms to invest in cleaner technology.

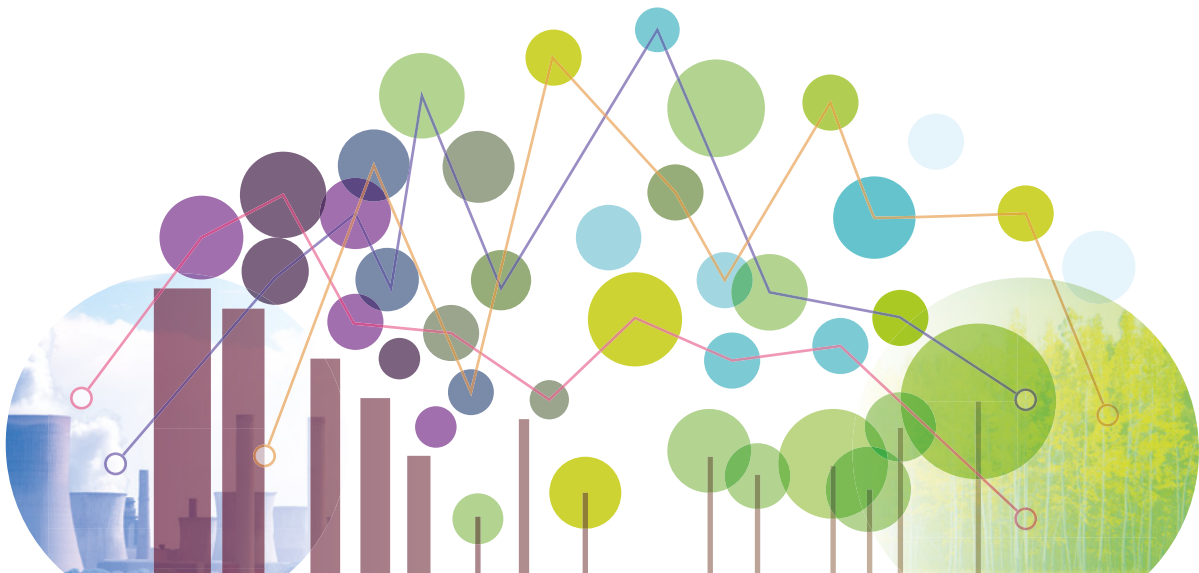
## A decrease in global emissions

But how were we able to show that the fall in emissions between 2005 to 2012 was a direct result of this market-based policy – and not down to other factors, such as fluctuating economic fortunes, outsourcing polluting production beyond Europe's borders or simply closing down carbon-emitting facilities?

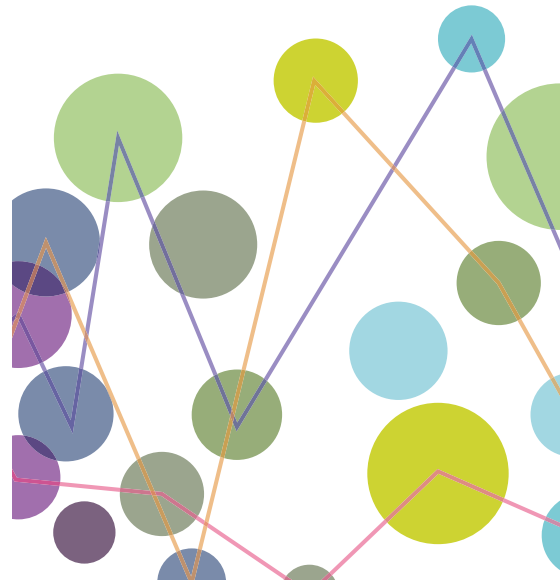
We cross-referenced detailed information on French manufacturing firms gathered by the nation's authorities since 1996 – long before the carbon market was conceived. We looked at a range of factors – from manufacturers' use of fuel through to imports, staffing and economic performance – and were able to compare how firms within the carbon market performed compared with those outside, and observe differences as carbon markets kicked in.

Even though emissions have been declining in the manufacturing sector in every advanced economy regardless of carbon markets, we show that the 14%-16% reduction accounted for a third of the overall fall. Encouragingly, we found that the emissions reduction hasn't come at the expense of performance – production and turnover remained stable – nor do we observe any job losses.

Economists largely agree that market-based policies are the best way to cut emissions



There was no evidence that firms in the European scheme had simply imported more polluting goods, which would have shifted the emissions created beyond their borders



### Carbon emissions beyond Europe

There was also no evidence of “carbon leakage” – that the firms had simply imported more polluting goods instead, thereby shifting the emissions beyond their borders. Emissions are not being transferred because global emissions have decreased.

Although in this instance we haven’t measured whether firms were investing in new facilities beyond Europe, our separate study revealed that multinationals that belong to the EU’s emissions trading system don’t increase their share of emissions beyond Europe.

Perhaps most encouragingly, we discovered – where we had the relevant data – that companies were investing in cleaner production technologies. This is the ideal scenario: a carbon market that not only cuts emissions but also generates investment and paves the way for cleaner industry practices and systems.

We can’t ignore the impact of the global financial crisis, which happened during the period we examined: could these energy-intensive firms have been hit by the fallout? Or were some regions hit harder than others, and did this skew the results? We were able to identify that this wasn’t the case. The reductions we have seen in these results are real and verifiable.

Our work raises new questions. Our investigation took place during a stretch when the price of carbon credits was relatively low – at around €15 between 2008 and 2012. Today the market has evolved: European prices peaked last year at around €100 and are still more than €70. Do these higher prices deter manufacturers from investing in new European facilities? Do they shift production beyond Europe when the price is too high at home?

What will be the impact of the new mechanism to charge a carbon levy on imports from beyond Europe – the carbon border adjustment mechanism – on emissions within the continent? We’re now working with partners in France,

Germany, Italy, the Netherlands, the UK and beyond on a pan-European data analysis of the impact of the carbon market on emissions. We also want to understand more about the impact of carbon trading on supply chains that aren’t directly part of the scheme. What impact does the market have on wider innovation?

Climate change caused by greenhouse gas emissions is one of the greatest challenges the world must tackle. Economists around the world largely agree that the best way to cut emissions from industry is through market-based policies rather than direct regulation. Our work gives the message that if well designed and well implemented, carbon markets are an effective policy tool – they can deliver change.

This article was first published as ‘Do Carbon Markets Work?’ by IB Knowledge on the Imperial College Business School website (<https://www.imperial.ac.uk/business-school/ib-knowledge/finance-strategy-leadership/do-carbon-markets-work/>). It draws on findings from ‘Does Pricing Carbon Mitigate Climate Change? Firm-level Evidence from the European Union Emissions Trading Scheme’ by Jonathan Colmer, Ralf Martin, Mirabelle Muûls and Ulrich Wagner, CEP Discussion Paper No. 1728.

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