# EU Climate Policy Insights and Interactions

September 2015

EnvEcon Decision Support

ENTRACTE

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Decision Support

**Reference**
Convery, F.J, Ellerman, A.D. and Kelly J.A (2015) EU Climate Policy – Insights and Interactions, EnvEcon Decision Support Series 2015/2.



**Acknowledgements**
This policy brief has been compiled under the FP7 ENTRACTE research project. The research has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement no 308481. The authors (Convery, Ellerman and Kelly) are solely responsible for its content. It does not represent the opinion of the European Community and the Community is not responsible for any use that might be made of data appearing herein. The report considers, and attempts to synthesise, some findings from a selected number of research deliverables from the ENTRACTE research project. However there is interpretation and opinion by the authors thereon, in terms of defining the insights they believe may be derived for climate policy from this research. This brief is not therefore to be considered a final consensus report from the ENTRACTE project nor does it drawn upon all of the research conducted under that project. It was launched at an event on the 25th September 2015, where a selection of invited speakers and panellists engaged to discuss the defined topics.

Throughout this piece the numbers in parentheses (e.g. 7.7) reference a list of deliverables from the ENTRACTE research project that are listed on the backpages of the brief. This is not the full list of project deliverables, but rather includes those research papers and policy briefs that were finalised and considered at the time when this policy brief was compiled. The full set of final ENTRACTE research products can be found at http://ENTRACTE-project.eu/publications/

# CONTENTS

# EXECUTIVE SUMMARY

This policy brief offers insights relating to the future of European climate policy, drawing directly from research undertaken as part of the FP7 funded research project – ENTRACTE **entracte-project.eu**.

The principal aim of this project was to understand climate and energy policy interactions in Europe, and acknowledging those interactions, to conduct research that would support the identification of a feasible and effective policy mix to achieve Europe's ambitious long-term climate targets.

The detailed research outputs are accessible through the project website and individual ENTRACTE deliverables are referenced throughout this brief.

Headline messages from the research include:

- Policy interactions are numerous and unavoidable. They are a fact of life in policy and no different in effect than market interactions. Our research shows that they can as easily reduce costs, by overcoming market barriers, as they can increase costs, by constraining cheaper options.

- The most sustained recession since the 1930s has been the single largest contributor to reducing the levels of carbon emissions from what they were expected to be at this point in time, and this has in turn lowered the cost of meeting the European Emissions Trading Scheme (EU ETS) cap. However, our research, like that of others, shows that the ETS has reduced European carbon emissions even farther, perhaps by as much as 15% below what they would otherwise have been in the absence of this mechanism.

- Innovation is the key to long-term cost reductions and our research shows that existing climate regulation, of all kinds, has stimulated innovation in emission-reducing technology. There is, however, no evidence from the research that economy-wide productivity has been either increased or decreased by this regulation and the associated innovation that it has triggered within the market.

- Given the consensus in the literature that the EU ETS has had little to no effect on competitiveness, the ENTRACTE research focused in on issues involved in implementing border carbon (or tax) adjustments should they become necessary as EU ambition increases and should major trading partners not take commensurate measures. The research shows that the design requirements for effective border carbon (or tax) adjustments are extremely challenging, and identifies an immediate need to develop the means to track embedded emissions and understand the complex domestic effects of such adjustments.

*"THE PRINCIPAL AIM OF THIS PROJECT WAS TO UNDERSTAND CLIMATE AND ENERGY POLICY INTERACTIONS IN EUROPE."*

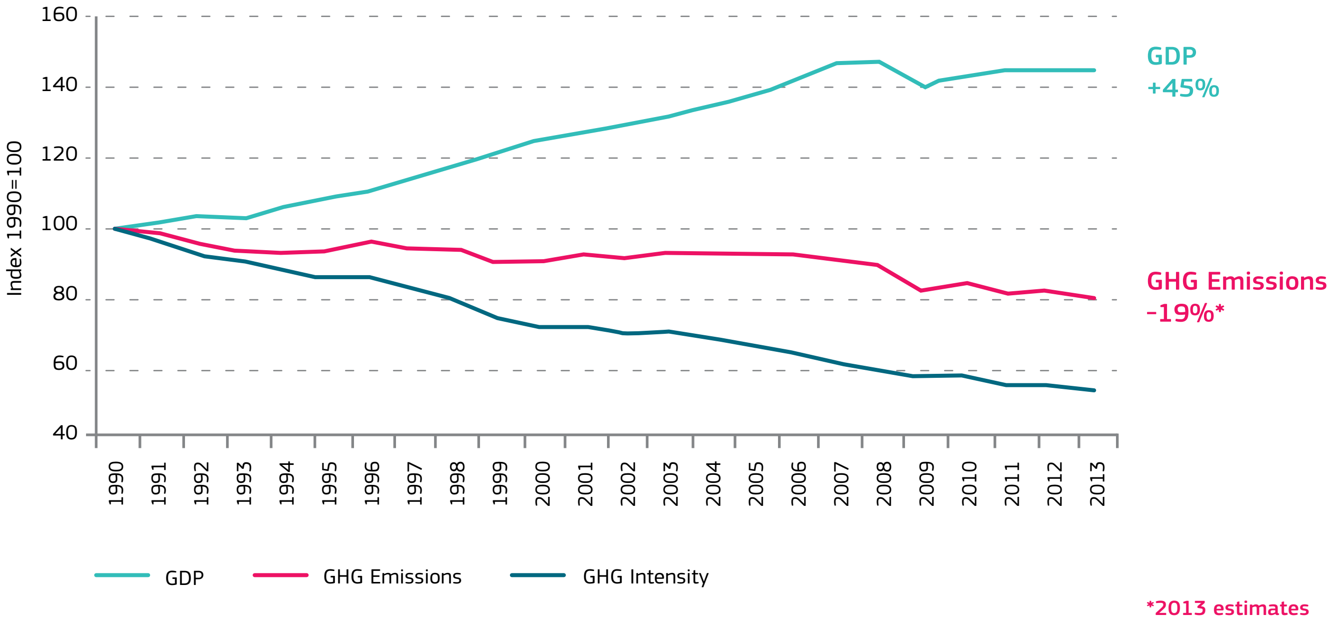
# THE CONTEXT

In a broad sense, European climate policy has delivered demonstrable success. The link between greenhouse gas emissions and economic growth has been broken; since 1990, the evidence shows that GDP has risen in real terms by 45%, whilst GHG emissions have fallen by 19%. Notwithstanding these outcomes, Europe has set an ambitious path for future climate targets which will require investment, innovation and a coherent policy mix that pulls and pushes Europe along the path of decarbonisation, whilst never losing sight of other important societal goals under headings such as employment, equity, efficiency and competitiveness.

The ENTRACTE research assessed the performance and interactions of the set of policy instruments that are at present being used, or are in prospect, in the context of European climate policy, and considered practical pathways towards a low-carbon future in light of such economic and policy constraints (7.7 and 7.10a).

The macroeconomic context for the first (Pilot) period (2005-'07) of the EU ETS was characterised by robust economic growth; but during the second period (2008-'12), GDP shrank, and subsequent growth has been modest. This economic decline, and the associated challenges of currency and unemployment, have unsurprisingly been a dominant preoccupation of senior policy makers in Europe over the last number of years.

## EU Cutting Greenhouse Gas Emissions While growing the Economy




Source: EEA, DG ECFIN (Ameco database), Eurostat

# THE CONTEXT

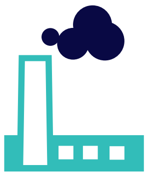
## Real GDP Growth (%) EU 28

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|
| Real annual GDP change (%) | 2.0 | 3.4 | 3.1 | 0.5 | -4.4 | 2.1 | 1.7 | -0.5 | 0.1 | 1.3 |

Source: Eurostat

Notwithstanding the challenges of this on-going crisis, the leadership of the Union has prioritised and agreed ambitious climate goals for 2030. Across all sectors there is a commitment to an accelerated reduction in greenhouse gas emissions by 40% of 2005 levels by 2030. This change will be comprised of a 30% reduction for Non-ETS sectors and a 43% reduction within the ETS. The latter is to be achieved by increasing the rate of decline in the annual supply of allowances in the trading scheme from the current 1.74% to 2.2% from 2021 to 2030 and beyond. This commitment has been followed by efforts to address the perceived oversupply of allowances, with proposals for an automatic sequestering of 12% of the total allowances in circulation into a Market Stability Reserve when the bank of unused allowances exceeds 833 million tons. In parallel with these direct initiatives to reduce European GHG emissions, the EU has also set goals for renewables (27% of final consumption) and energy efficiency (27% improvement compared to a baseline) that will, less directly, have a bearing on the GHG outcomes.

The presence of multiple policy measures that will influence GHG emission outcomes, has triggered increasing debate about the number of EU policies in play in this context. Tinbergen (1952) argued that there should be one instrument for one policy, the implication being that multiple policies addressing the same challenge would be inefficient. However, Tinbergen himself introduced a caveat, noting that additional "supplementary" or "complementary" tools are often required to control side-effects or otherwise bolster a 'primary' tool. The ENTRACTE research started from the proposition that the use of multiple instruments will be a continuing reality. The concept was to consider the outcomes they deliver, and how they could work better individually and together.



*"ACROSS ALL SECTORS THERE IS A COMMITMENT TO AN ACCELERATED REDUCTION IN GREENHOUSE GAS EMISSIONS BY 40% OF 2005 LEVELS BY 2030."*

# CLIMATE POLICY INTERACTIONS

The EU has implemented the most serious and comprehensive climate policy of any nation or region of the world. The move from theory to practice has resulted in an operational complexity derived from two main sources. Firstly, the multiplicity of decision-making bodies, twenty-eight Member States plus the EU, and secondly the number of other policy measures at play in the market. Whilst attention tends to focus on policies at the EU level, policies adopted at the member-state level are equally important, and even more diverse, as made evident by the 200-plus page compendium of existing climate policies in each Member State and at the EU level (1.1). This set of interacting climate and climate-related policies at all levels of government inevitably raises the question of whether the complexity is so great as to be counterproductive, thereby frustrating achievement of the climate objective.

The result that recurs throughout the ENTRACTE research is that these other policies do not so much affect the achievement of the climate goal as they do its cost. The ENTRACTE research generally confirms the standard economic insight that an emissions price (or tax) offers the best prospects of reducing emissions cost effectively (6.1). However, it also finds that adopting complementary measures to address other externalities, typically those relating to innovation and technology adoption, such as R&D spill-overs or various barriers to the adoption of more carbon efficient choices, can reduce costs by as much as one-third when compared to a "pure" price approach (4.2). Thus, the good news is that appropriately targeted complementary policies are not distorting, but rather they are potentially cost-reducing (6.3). However, the word "appropriately" must be emphasised in this context. A particularly interesting finding is that the need for these complementary policies diminishes over time as the effects of the spill-overs, learning-by-doing, scale economies, and breaking of informational or other barriers are realised (4.2).

One important and controversial issue is the extent to which improved energy efficiency reduces emissions. Making things cheaper increases the demand for the more efficiently produced or consumed item, creating a "rebound effect" that takes away some of the expected reduction in energy use or emissions. The ENTRACTE research focused on the specifics of Europe and confirmed what other research has shown: that the effect is present and that it can be very large, depending on the country and particularly the sector (3.1).

Our research even found cases, such as in Norway, where energy efficiency policies increased emissions.

When conservation measures focus on household electricity, and where industry is an important consumer of electricity on the same grid, reduced household energy demand can lower electricity prices sufficiently to make industrial goods more competitive and to increase industrial emissions by an amount greater than the savings from reduced household electricity demand (3.1). The same research illustrates the importance of complementary carbon policies: if the emissions in the two sectors are capped, as in the European Union, the effect of such an extreme rebound is not higher emissions but a higher carbon price.

Another notable interaction concerns the distributive effects of climate policy. Auction revenues from the ETS are distributed in a manner that favours lower per-capita income member states; however, the distributive effect within member states depends on how these auction proceeds are used. The ENTRACTE research shows that the auction revenues are sufficient in all member states to counter the regressive distributive effects of climate policy. Moreover, even if ambitious renewable energy targets reduce the carbon price, the reduction in auction revenue is not so great as to seriously threaten any member state's ability to counter regressive effects (3.3). An even more interesting finding emerged from a study of the effects on household expenditure in Italy of recovering renewable energy payments as supplemental charges on electricity bills: the regressive effects may not be as great as commonly expected (3.3). While controversial and subject to further testing, these results are in line with those found by others when welfare is measured by expenditure instead of income (thereby including transfers), and when the interactions with wages and returns to capital are taken into account.

A final general point concerns the ubiquity of interactions among the many climate-related policies at the EU and member-state level, as well as those caused by the existence of other policy goals. These "policy" interactions are no different in effect than "market" interactions, such as those from changing fuel prices and rates of economic growth, or innovation. While policy can be changed, doing so is not easy, especially when there are multiple policy objectives and diverse circumstances. A good example would be policies in Poland to reduce dependence on natural gas from Russia, which would imply more GHG emissions because of Poland's resource endowment. Here, energy security and climate objectives conflict, although to the extent the shift is in the sectors covered by the ETS, no increase in aggregate EU emissions would occur. The fundamental insight arising from this research is that such interactions are inevitable, whether policy-based or not. The challenge is to manage them well (6.3).

# CONTRIBUTION OF EU ETS TO ABATEMENT

Looking back to assess the contribution of any policy to climate outcomes is not for the faint hearted, and this applies with particular force when the time series available to interrogate the evidence is relatively short and is characterised by a lot of economic turbulence. In addition to climate-specific policy, there are many interrelated factors shaping outcomes and emissions, as noted earlier in this brief.

In the case of greenhouse gas emissions policy in Europe, we observe all of these disparate forces at work. Economic growth and close to full employment prevailed in the 2000-2008 period, when the trading scheme was designed, and the pilot (2005-07) was implemented, but this gave way to the most sustained recession Europe has experienced since the 1930s; this began in 2009, and continues in most of Europe in 2015. There have been sharp changes in the absolute and relative prices of oil, coal and natural gas, and the costs of renewables have fallen sharply. Technological innovations in oil and gas extraction (fracking), car transport, energy efficiency, grid management, access to information etc. are changing choices and our understanding of them, often in real time. And changes in lifestyle and values, e.g. the growing popularity of city center living and working, continue to influence outcomes.

Notwithstanding these challenges, the ENTRACTE project attempted to separate out the impact of the EU ETS on emissions from the other forces shaping outcomes (2.1). A review of the previous literature, which focused mainly on the pilot period (2005-07), suggests reductions in the range of 2-6 per cent by comparing an estimated counter factual with the actual outcome.[1] The ENTRACTE authors used a different approach, comparing emissions from firms in the EU ETS with comparable installations that were not so included. Focusing on the second period (2008-12) and using French data, the study found that:

- The implementation of the EU ETS caused a reduction in emissions by French firms of between 10-20%, with an average of just over 15%.
- Most gains were from increased carbon efficiency (~50% from a switch to gas, and heat recovery).
- There was no evidence of firms relocating their production from plants within the EU to their operations outside of EU jurisdiction.
- There was some evidence of negative employment effects.

They also noted that it is price expectations that shape the nature and magnitude of investments to reduce emissions. These findings from the French analysis are important. They demonstrate that, even under the most adverse of circumstances, emissions trading can deliver reductions in emissions. This research is being extended to include other European countries now, and will offer important evidence on the performance of the EU ETS.

Research was also directed to the proposals to reform the ETS that aim at increasing the price and reducing volatility. Building on an established finding in the economic literature that contingent instruments, ones that respond to changes in circumstance, reduce costs over the long run by providing a steadier price, ENTRACTE researchers developed a model of the ETS with an adjustment allocation mechanism of allowances (the market stability reserve or MSR) where firms are risk neutral and risk averse (2.6). The model was used to assess how the ETS would would behave under a wide variety of emission paths with and without the MSR. The results showed that the MSR mechanism would have an effect on the size of the privately held unused allowances (private bank) and that the European Commission's proposed rate (circa 12%) for withdrawing allowances was in the general region of what would minimise long-term costs of compliance.

*"CHANGES IN LIFESTYLE AND VALUES, E.G. THE GROWING POPULARITY OF CITY CENTER LIVING AND WORKING, CONTINUE TO INFLUENCE OUTCOMES."*

1 Ellerman Buchner: -2.4% to 4.7% emission reduction 2005-6; Ellerman, Convery & de Perthuis: -3% in Phase I; Ellerman & Feilhauer (2008) for Germany: -6.3% industrial emissions, -4.1% power sector (average-5%); Anderson & Di Maria (2011, ERE): -2.8% EU wide.

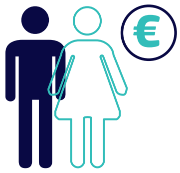
# INNOVATION AND TECHNOLOGY

Economic growth, and the associated growth in jobs and income, depends on productivity growth, and this in turn depends in part on innovation – improving existing goods and services at lower cost, or developing and selling new products and services – and essentially doing more with less.

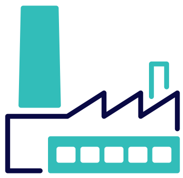
What applies generally in regard to economic development applies with particular force to addressing climate change; we need to find ways of lowering the costs of reducing greenhouse gas emissions to the point that it becomes politically and socially feasible to achieve the reductions needed to limit the rise in global temperature. The Porter Hypothesis maintains that properly designed environmental regulations (in particular, market-based instruments such as taxes or cap-and-trade emissions allowances) can "trigger innovation [broadly defined] that may partially or more than fully offset the costs of complying with them in some instances" (Porter and van der Linde 1995, p. 98).

This proposition underlies much of the 'green growth' rhetoric; by doing the right thing for the environment, we can also find new sources of "green" growth that more than compensate for the decline induced by the regulation. One of the features of the economics profession is to take a jaundiced view of such magical outcomes – if there was a €20 note on the street, it would already have been picked up.

The ENTRACTE work sought to address the effect of climate policy on innovation in the EU, as others have (Ambec et al, 1991), and likewise found support for a weak form of the Porter Hypothesis – innovation in environmental technologies has been stimulated by environmental regulation (4.1). But it did not find that wider total factor productivity for the economies as a whole has been stimulated – it therefore fails the stronger form of the Porter Hypothesis. An interesting and ironic implication of the project's research on border-carbon adjustments (see ETS and Competitiveness section) is that such adjustments, which impose a carbon price on imports, could stimulate innovation outside the EU, especially if the propensity to innovate is higher outside the EU than within (5.4).




*"ECONOMIC GROWTH, AND THE ASSOCIATED GROWTH IN JOBS AND INCOME, DEPENDS ON PRODUCTIVITY GROWTH, AND THIS IN TURN DEPENDS IN PART ON INNOVATION."*



*"WE NEED TO FIND WAYS OF LOWERING THE COSTS OF REDUCING GREENHOUSE GAS EMISSIONS TO THE POINT THAT IT BECOMES POLITICALLY AND SOCIALLY FEASIBLE TO ACHIEVE THE REDUCTIONS NEEDED TO LIMIT THE RISE IN GLOBAL TEMPERATURE"*

# ETS AND COMPETITIVENESS

Few aspects of climate policy have more political resonance than the related concerns for competitiveness (loss of domestic output and employment) and leakage (increased emissions outside the EU). While related, the two are not identical. The shifting of output and jobs abroad is only one form of leakage and, modeling work would suggest, not the most important one. Most of the leakage comes from the higher energy consumption in the rest of the world in response to lower energy market prices caused by reduced demand in Europe. However, estimates of leakage effects depend heavily on model parameters and the extent to which other regions have carbon policies in place (3.1). While one study of modeling results found a range of 5% to 19% (with a mean of 12%) others have found rates in excess of 100% and even negative leakage, that is, reductions in non-EU emissions in response to EU climate policy (5.1).

A review of both ex ante and ex post studies of the effects of the EU ETS on competitiveness, narrowly defined as output/job loss, indicates little to no effect, at least at the carbon prices observed to date (5.1), although these estimates also depend greatly on modeling assumptions (5.3). Still, a common view is, as one observer put it, that "a carbon price is not a market opportunity but a cost of doing business in Europe"(7.7). This sentiment reflects a concern not so much for the average effect, as predicted by models, as a fear of the worst that could occur. To address this issue, one project deliverable developed plausible, empirically based "worst case" estimates of the job loss potential from the price differences created by carbon pricing. While results varied by sector, they showed consistently negative effects (e.g. losses in employment), which despite being "worst case" were still relatively small in magnitude: a 0.9% to 1.7% loss of jobs for a 10% increase in product price (5.3).

Given the consensus of little, or at most the aforementioned "worst case" effects, the project's research effort was directed to policy measures that could address these concerns should protective instruments become necessary as EU climate policy becomes more demanding. Such measures can be generically described as border carbon adjustments (BCA), which would tax the carbon content of imported goods and rebate the carbon costs of exported goods. Since such policies are not now in place anywhere, the research is necessarily theoretical, but no less fruitful of policy insights for that.

The general finding is that well designed BCA can solve the problem of industrial relocation to countries lacking equivalent carbon constraints, but that the requirements of good BCA design are extraordinarily demanding (5.1, 5.2). The difficulties arise not from the relatively easy-to-measure direct emissions but from the much harder to determine, indirect or embedded emissions for the entire, often globally integrated, supply chain, including electricity. Moreover, the adjustments would need to apply not just to final goods but to intermediate goods, which constitute the major part of international trade. This in turn would make final goods production more expensive in the country imposing the BCA, thereby imposing more costs on domestic consumers and making exports less competitive internationally absent a complete rebating of all carbon costs (5.1).

The challenge of attributing embedded emissions raises further questions about the basis upon which the BCA is to be levied (or rebated) and the incentives thereby created. Should the border charge be levied by product, differentiated by exporting country, or perhaps even by firm? Generally speaking, the less differentiated the basis, the easier it is to apply, but also the blunter and less efficient it will be, and the more problematic are the incentives and distributional consequences for others whose cooperation is needed in solving a problem of the global commons (5.2). For example, a single, undifferentiated tariff applied regardless of the origin of the imported good is relatively easy to implement, but it punishes relatively clean and dirty producers alike. A regionally differentiated tariff will partially solve this problem, but also shifts the cost to exporters with higher emissions intensities whose cooperation in solving the global problem is essential (China, Russia), while creating windfalls for others (Japan, US) whose production intensities are lower. Theoretically, firm-specific differentiation in rates would do the most to overcome these problems, especially if adjustable as foreign firms adopt lower emitting production processes and choose lower-emitting inputs, but this assumes a capability to monitor and track that is not presently in place.

The policy implication to be drawn from this body of research is not just the obvious "proceed with care," but also the need to develop the means for tracking and monitoring emissions, and the understanding of the complex effects should such measures become necessary. With low carbon costs that hardly affect the existing advantages of production in Europe, not to mention a declining euro that more than compensates for carbon as well as other "costs of doing business in Europe," there is yet time to work out the problems identified above.

# FUTURE RESEARCH

The ENTRACTE research project has examined European climate policy and has sought to parse the complex interactions that exist between the European Union Emissions Trading System (EU ETS) and other climate related policies and instruments. This work has drawn on a number of developing data sets that can offer insight on the responses of firms, citizens and markets to altered incentives, information and expectations over time. As the work has evolved, certain areas have been identified as candidates for future research. In some cases this is due to the expectation of improved data availability over time, whilst in others the motivation is driven by a belief that greater knowledge of the area would be of particular benefit to stakeholders in European climate policy processes in the medium term. The following are highlighted as recommended areas for future research in this field:

1. Understanding how climate policy performs as the economic context (economic growth, energy prices, $CO_2$ prices, innovations in products and services etc.) evolves over time. In particular, understanding how climate policy can encourage greater innovation and how different firms or sectors have responded, or would respond, should be a high priority for the research and policy community.
2. An equal priority should be further research on the effects of carbon regulation on output, employment and external trade. The available evidence suggests little to no effect, but this is so counter to common perception that greater research to confirm or disprove the absence of any strong effect is needed.
3. A relatively neglected aspect of climate policy are the distributional consequences within countries, not so much with respect to firms (although that too is important), but rather with regard to impacts upon citizens and households.
4. Climate policy is necessarily forward-looking and the only tools we have to ensure consistency in our outlook and expectations is modelling. More closely aligning theoretical assumption with increasingly available empirical data is a high priority, especially in so far as they are concerned with firm behavior and market structure.
5. Given the challenge of designing an effective border carbon (or tax) adjustment mechanism, there is a clear need to develop a robust and practical means of measuring embedded emissions and to direct modelling to understanding the domestic effects of these adjustments. Additionally, a better understanding of geopolitics – for example, conformance with WTO rules, likelihood of trade retaliation and an escalating trade war – will be an important asset to future decision making processes in this context.

*"AS THE WORK HAS EVOLVED, CERTAIN AREAS HAVE BEEN IDENTIFIED AS CANDIDATES FOR FUTURE RESEARCH."*

*"AN EQUAL PRIORITY SHOULD BE FURTHER RESEARCH ON THE EFFECTS OF CARBON REGULATION ON OUTPUT, EMPLOYMENT AND EXTERNAL TRADE."*

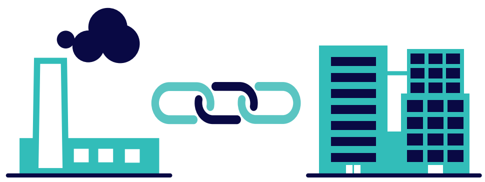
# FUTURE REFORM AND CLOSING REMARKS

European policy tends to proceed either as a big step change, or as a series of small steps which build up in increments over time. The European Single Currency decision is an example of the former, while European climate policy and the European Union Emissions Trading Scheme are examples of the latter. Although the EU ETS was a big step in tems of originality, its phasing-in was very conservative: coverage initally was confined to sectors that were already in the EU environmental regulatory system for other pollutants, emissions could be readily monitored, reported and verified, allowance allocation was generous and mostly given away for free. Expansions to include other sectors and emissions proceeded incrementally, as did the addition of other gases, the tightening of the cap, and the increasing share of auctioned allowances. One part of the explanation for such incrementalism is political reality – usually the only way to secure progress was to do it slowly. Another reason was to capture the benefits of learning by doing, taking steps to find out what works, and then allowing time to integrate what seems to improve performance. This muddling through is a sort of prototype for how we can make progress globally.

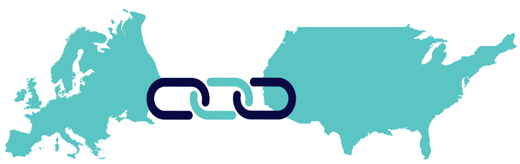
Looking ahead, there will continue to be learning and doing, and future reforms are likely to be of the "two steps forward one step back" way of doing. Areas of policy interest and opportunity that are likely to emerge include:

- Linkage between the traded and the non traded sectors within the EU. As the cap continues to shrink, and allowance prices recover, there will be increased interest in ensuring that overall compliance costs within the EU are minimized. This will also encourage continuing assessment of expanding the coverage of the EU ETS.
- This may also encourage further consideration of the means to allow reductions achieved by offsets in developing countries on a sectoral basis to be used as credits in the EU ETS. This will also be encouraged by the need to channel finance into developing countries.
- The possible emergence of a club of major emitters (China, the US and the EU accounting for more than 50% of the total emissions) that collaborate to accelerate progress on climate change abatement.
- Investing in research and demonstration of carbon capture and storage as a means of reducing emissions and allowing some use of fossil fuels into the future.
- Readiness for the surprise. The Great recession was a force majeure type event, outside all expectations, and there will be other surprises. A breakthrough that allowed very effective and low cost energy storage could dramatically change the low cost energy mix in the direction of renewables and lower emissions.
- Addressing fairness within the the EU and between the peoples of the world will be a continuing challenge, and will give adaptation to climate change a higher profile than heretofore.

And, like ENTRACTE, the research community has an obligation to keep interrogating the choices, learning from the past and informing the future as best we can, in a world where the first best policy choices are typically not available.



*"LINKAGES BETWEEN THE TRADED AND NON-TRADED SECTORS, AS WELL AS BETWEEN INTERNATIONAL MARKETS, WILL PRESENT GREAT CHALLENGES AND OPPORTUNITIES."*



# ENTRACTE DELIVERABLES CONSIDERED FOR THIS BRIEF

| | | |
|---|---|---|
| D1.1 | Current climate policies and potential future policy environments | ZEW |
| D1.2 | Stringency of Climate Policies | FEEM |
| D2.1 | Ex post evaluation of the EU-ETS | LSE |
| D2.2 | The impact of transaction costs, adoption of technologies and the interaction with EMS | ZEW |
| D2.3 | Empirical assessment of monitoring and enforcement of EU ETS regulation | LSE |
| D2.4 | Legal implementation of the EU ETS at Member State level | TSC |
| D2.5 | Market concentration and transferable quotas | TSC |
| D2.6 | Cost-containment mechanisms and market oversight | LSE |
| D2.7 | Expanding the sectorial and regional scope of the EU ETS | PIK |
| D3.1 | Combinations of energy efficiency policies and other energy and climate instruments | FCO |
| D3.2 | Renewable energy supply in Europe: Addressing technological and political preconditions | FCO |
| D3.3 | Distributional impacts of energy policies and the consequences for optimal policy mixes | ZEW |
| D4.1 | The bidirectional causal link between environmental policy and technology policy | FEEM |
| D4.2 | The optimal policy mix in a global general equilibrium setting | ZEW |
| D4.3 | Assessment of prospective policies | TSC |
| D5.1 | Economic fundamentals of trade-related climate policy measures | PIK |
| D5.2 | The efficiency, feasibility, and effectiveness of various BTA designs | FCO |
| D5.3 | Empirical Assessment of EU sectors ‘at risk’ and devising suitable indicators | Imperial |
| D5.4 | The dynamic efficiency of trade-related climate policy instruments | ZEW |
| D6.1 | Mixing instruments: monitoring costs, legal feasibility and conditional policies | TSC |
| D7.5 | Proceedings of workshop to define policy scenarios | ZEW |
| D7.6 | Proceedings of the workshop on scenarios for the long-term decarbonisation of the EU | EnvEcon |
| D7.7 | Proceedings of joint stakeholder workshop on interim results of the project | EnvEcon |
| D7.10a | Future Climate Policy: Challenges and choices a European perspective | EnvEcon |
| D7.10b | EU Climate Policy – Insights and Interactions | EnvEcon |

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# PROFILES

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An event was held on the 25th of September 2015 to launch this policy brief. The objective was to deliver the key messages to principal policy stakeholders and to discuss the future path of European Climate Policy. Speakers and panellists included:

## Speakers and panellists at the launch event:

**Andreas Barkman**
European Environment Agency

**Richard Baron**
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