



Controlling Carbon

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Commissioned by Molly Scott Cato MEP



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Preface

by Molly Scott Cato MEP

We have run out of superlatives to describe the significance of climate change as a threat to humanity. We have gone beyond last chances and are just hoping against hope that the COP21 negotiators in Paris will exceed our expectations and respond to the needs of current and future generations.

As a Green economist I believe that what we need most urgently is a lever that can be used to exert pressure on the global economy to move beyond the era of fossil fuels. In this report Victor Anderson compares and contrasts a number of possible levers, explaining each clearly and simply before reaching a pragmatic conclusion about what to recommend. His proposal may not be the final answer but it is an intriguing and important contribution to an urgent debate.

Nobody can expect the issue of climate change to be resolved at the COP21 talks in Paris, but it is reasonable to hope for an agreement that ensures the countries of the world stick to their pledges to reduce CO₂ emissions. However, the decisions about what policies are needed to make those pledges a reality will continue to be debated. It is those deliberations that this report is intended to inform.

Very often debates about tackling climate change get bogged down between rival camps, supporting their own scheme and its groundbreaking proposer. Victor Anderson's report is different. By exploring the merits to several different schemes he is able to take an entirely rational approach and able to realise that we probably need a mix of solutions to achieve urgent reductions in carbon dioxide emissions.

I am pleased to offer this report to help elucidate the range of policy options available. Controlling Carbon is an ambitious title but it is the minimum we must do if we are to ensure a liveable planet for future generations.

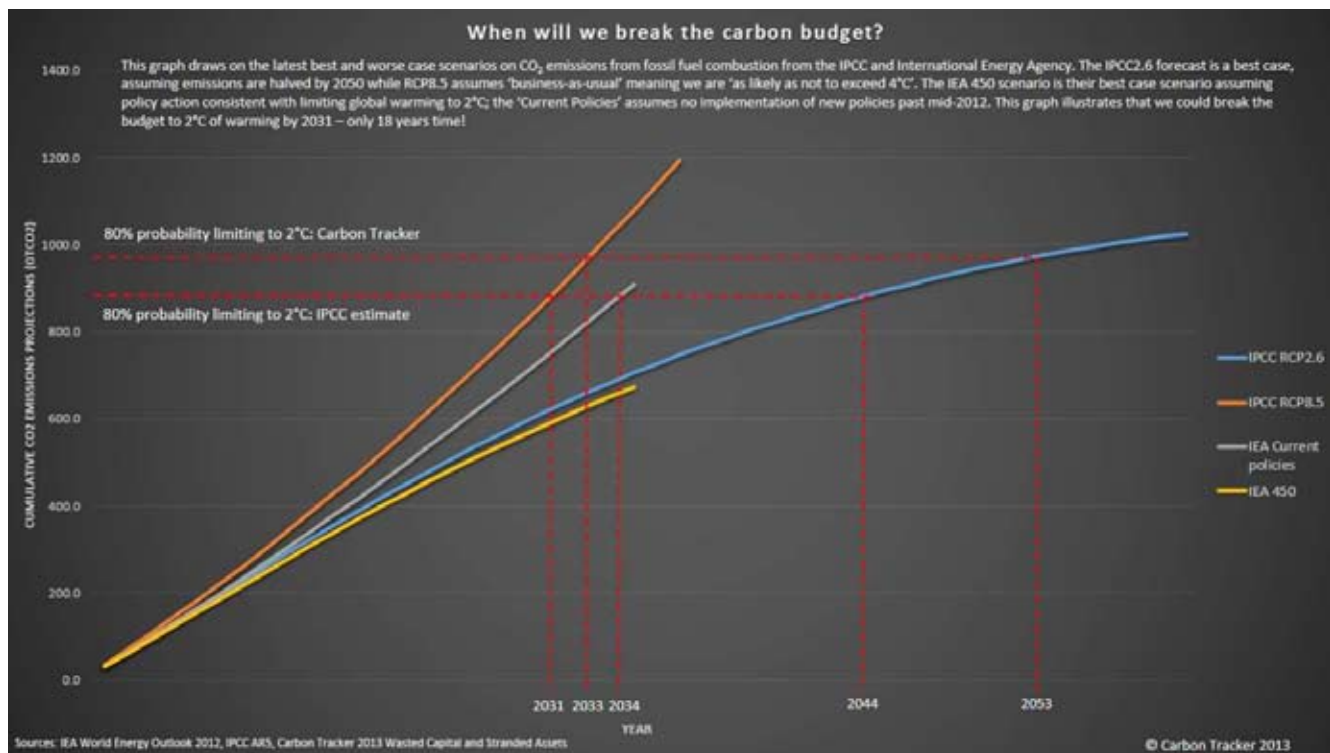
Acknowledgements

In producing this report, we have benefited greatly from comments by Dave Powell, Anders Ekeland, Jenneth Parker, John Jopling and Beth Stratford.



Introduction

The European Union's efforts to restrain carbon emissions depend on the success of the Emissions Trading System (ETS). However, the EU's current trajectory of emissions will not deliver the contribution it should be making towards stabilising the global climate.



It does not necessarily follow that the ETS should be scrapped, but it does mean that it should at least be added to, rather than seen as a policy which can solve the problem of Europe's emissions on its own.

This report sets out the case for supporting a series of additional policies, which could restore us to the trajectory required by the urgency and scale of the climate crisis, and including the requirements of fairness internationally.

I start by discussing the ETS, and how the way it has turned out in practice is different from the claims which were made for it in theory. This is followed by a discussion of schemes to amend and improve the workings of the ETS. Then the argument moves on to outline a range of different policy ideas which have been put forward to tackle some of the main causes of climate change, and ends with a proposal which aims to combine the best of what has been advocated.

The aim of this report is to contribute to the thinking that is needed as we move towards the Conference of the Parties to the UN Climate Change Convention in Paris towards the end of this year.

The EU has made important contributions to climate diplomacy and policy-making. However it would be a mistake to let this become the basis for complacency. There is still a much further to go.

The emissions trading system and what happened to it

The European Union Emissions Trading Scheme (ETS) places a cap on the carbon dioxide (CO₂) emitted by business and creates a market and price for carbon allowances. It covers 45% of EU emissions, and approximately 12,000 installations focusing on energy intensive sectors such as electricity generation, iron and steel, mineral processing and pulp and paper processing. The EU ETS scheme started in 2005 in order to help the EU meet its targets under the Kyoto Protocol. The scheme is currently the world's largest carbon-trading scheme and seeks to provide an incentive for installations to reduce their carbon emissions, in order to sell their surplus allowances.

(Based on Carbon Trust: <http://www.carbontrust.com/resources/reports/advice/eu-ets-the-european-emissions-trading-scheme/>)

A bias has been introduced into environmental policy-making by the dominance of neoclassical economics, both within government circles and amongst political parties. There has been a strong tendency to assume that economic instruments are the key to solving all problems – and amongst these, economic instruments of a particular type, which directly influence prices. The background assumption of such policies is that once the prices are right, the workings of the market will take care of the problem.

Hence the concept of monetary valuation of “natural capital” as the way to solve biodiversity and ecosystem difficulties, and the idea of the Emissions Trading System, together with rival proposals such as Carbon Tax, as the way to deal with the question of climate change.

No-one can plausibly deny that prices influence behaviour, and that markets to some extent function as a means by which that change in behaviour affects what is produced, how and where. This report does not set out to deny or disprove any of this, but simply to argue for a more balanced and thorough approach, in which market-based instruments play a part alongside policies of other sorts.

It is tempting to describe the ETS as a failed policy, as it has not delivered the emissions reductions required for Europe to play its full part in putting the world on the emissions trajectory necessary to prevent global climate instability. However this would be a mistaken approach, for three reasons:

- It looks to the ETS to solve the whole problem, whereas it could instead be regarded as one of a set of policies; one which leaves gaps which other policies could fill. We could add to the ETS rather than replace it.
- Pragmatically, the ETS has secured a great deal of acceptance across EU institutions, member states, and political groups – something which is not easy to achieve in such a controversial policy area. It is possible to reform it and add to it, but scrapping it would not guarantee a better solution; in fact, it would probably make the situation worse.

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- The disappointing way the ETS has turned out in practice is to a large extent due to corporate lobbying and political pressures, rather than basic failings of the ETS concept itself. Such pressures would have come into play whatever policy approach had been adopted towards the problem of climate change. There is a need to tackle this lobbying and pressure directly, through reforms in the way the EU institutions operate, rather than assume it would necessarily disappear if a different policy approach was taken.

Why the ETS was attractive

The basic idea of establishing an Emissions Trading System started with some important advantages, both economic and political, which understandably made it attractive to policy-makers and commenters on policy, and it achieved broad support as a result.

Economically, the ETS meant that there was no need to guess the right price at which to pitch emissions permits (or to set the rate for a tax on emissions), because the market would itself find the right price level for a particular, hopefully science-based, set annual level of emissions. Policy-makers could focus on their real concern, the total amount of emissions, rather than on what might be a fairly arbitrary guess at what the price of emissions ought to be in order to stay within that total.

The ETS also had the economic advantage of appearing – in theory – to deliver the desired emissions reductions in the most efficient and cheapest way, allowing the market to demonstrate which emitters had the highest demand for the permits. It was intended to be a system completely in line with the theoretical models produced by academic environmental economists.

The ETS had political advantages too. By not involving politicians in determining the price of permits, it allowed them to step back from the potential unpopularity of setting a price or tax rate to perform the same function. They could be seen as acting purely on a combination of scientific advice (setting the total) and market forces (distributing that total). This looked like it would make it politically easier to put the policy in place and achieve the desired emissions reductions.

As a “market-based instrument”, the ETS therefore appealed to politicians on the Right and Centre politically, who might have shied away from any approach they perceived as a “command and control” policy. For environmentalists simply wishing to find a way of restraining emissions, this implied that they could have a widely-supported policy, rather than one identified only with the Left. Europe could therefore avoid the political polarisation of the climate issue which has taken place in the USA, where most Republicans have responded to climate change by the simple tactic of denying climate science evidence.

The ETS idea therefore started out with broad political support, backed up by scientific advice on climate change, academic advice on environmental economics, and campaigners who were concerned far more with the objectives of the policy than with arguing about the details of its functioning.

However, the story of ETS implementation shows what can happen when a policy idea enters the world of politics, bargaining, and lobbying, and in changing economic conditions.

What happened?

The EU Emissions Trading System's potential effectiveness as a means of restraining carbon emissions has been undermined in four different ways:

- 1 The total amount of permits has been too large. The system was not sufficiently flexible to ensure that the economic downturn created by the global financial system in 2008 was reflected in a reduction in total permits. If that had happened, the ETS could have continued to maintain downward pressure on carbon emissions. In practice, permits were so plentiful that, for a time, their price in the market fell to a level at which the system became ineffective.

Table 1: The supply-demand balance 2008-2011

(in Mt)	2008	2009	2010	2011	Total
Supply: Issued allowances and used international credits	2076	2105	2204	2336	8720
Demand: Reported emissions	2100	1860	1919	1886	7765
Cumulative surplus of allowances	-24	244	285	450	955

Source: Community Independent Transaction Log (CITL), compliance data 2011 as published on 2 May 2012, European Commission

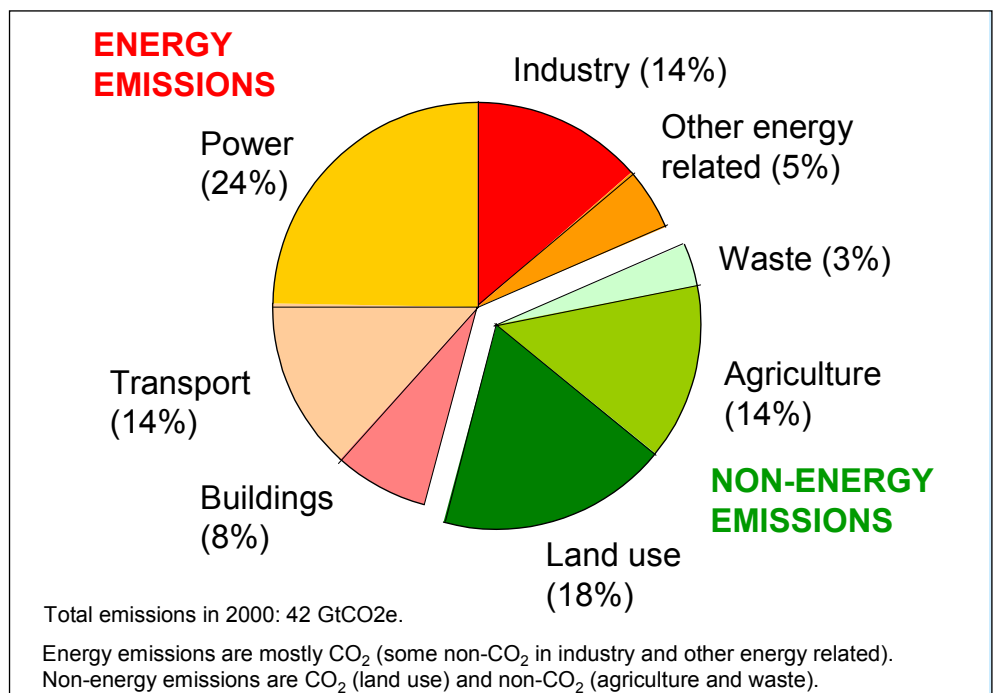
Figure 1 Carbon price evolution



Source: Intercontinental Exchange. Data for front-year futures contracts with delivery in December

- 2 Business lobbying has resulted in far too many exemptions for high-emitting industrial sectors. In each case, there have been arguments which have proved persuasive to the European Commission, particularly those drawing attention to the problem of international trade competition from non-EU producers which do not have to pay for permits or through any similar system. However, addressing this and other problems through a series of exemptions has undoubtedly weakened the overall impact of the policy.
- 3 Not only have there been exemptions, but carbon-emitting industries have received excess permits which they have then sold on, thereby giving themselves a subsidy, when the ETS was designed to make them pay a charge.
- 4 Aviation emissions were entirely excluded from the ETS until 2012, and are still excluded for flights beyond Europe (probably until 2020). This in turn affects the economics of airport expansion, a key source of future emissions increases.

Figure 2 Greenhouse-gas emissions in 2000, by source



Source: Prepared by Stern Review, from data drawn from World Resources Institute ClimateAnalysis Indicators Tool (CAIT) on-line database version 3.0.

How can we explain what happened to the ETS?

The history of the Emissions Trading System in practice reveals a number of factors concerning the economics and politics of climate change in the EU.

Academic environmental economics often appears to provide pain-free solutions to environmental problems, letting the market take care of

them, rather than requiring political action. This is misleading, because market-based instruments must always be established by politicians and governments, and can be seen as potentially subject to variation by them, e.g. through exemption and offset schemes. The use of market-based instruments does not in fact take politics out of the situation.

By appearing on the surface to take the politics out of the issue, market-based instruments can make politicians feel that they have no obligation to argue in favour of the policy, as they would have to in the case of a carbon tax or a system where permit prices were set by explicitly political decisions. There is therefore a strong sense that the policy can progress, despite the lack of public support built up by persuasive political advocacy.

In the case of the ETS, as in many other cases, the institutions of the EU have shown themselves to be unduly influenced by business lobbyists, often operating without transparency. This is a major and general problem in the functioning of the EU, holding it back from exemplifying the “European values” of democracy and openness, which are often claimed to be central to the EU’s ways of working.

There has been a genuine problem with competition in international trade, pointing to the need for international agreement on this, either through the UN Climate Change Convention or through WTO and other sets of trade rules. The international system currently gives a much higher priority to increasing the volume of goods travelling around than it does to restraining the emission of gases destabilising the world’s climate. Recent rounds of negotiations, for example over TTIP and TPP, confirm this picture, with trade negotiators apparently seeing themselves free from any policy objectives other than the maximisation of trade.

Overall, the record of the ETS in practice is a perfect expression of the continuing widespread ambivalence and half-heartedness which surround the climate issue. Unwilling to deny the science and have no policy at all, but not yet willing to respond to the urgency of the crisis with a sufficiently effective policy, Europe has instead chosen a compromise. The question now is whether we can move beyond that.

ETS reform

Problems with the ETS have been widely acknowledged. The EU’s own Court of Auditors issued a critical report on the workings of the ETS in July 2015. Their press release summed it up:

“Our audit shows that attention has to be given to market integrity and implementation so that the EU can be more confident that this flagship policy is fully equipped to deliver on emission reductions and low carbon technologies. The auditors found that the Commission’s and Member States’ management of certain aspects of the EU ETS, particularly during phase II, was not entirely adequate. There were problems with the framework for

protecting the market in allowances, and also problems with the actual implementation of the system...

No oversight of the emissions market has been established at EU level and cooperation involving national regulators and Commission was found to be insufficient, which could imply that distortions and anomalies with potentially serious effects are not appropriately managed.” [1]

Following this and a great many other contributions to the debate about the future of the ETS, including discussion by EU heads of state and government in October 2014, the European Commission published a set of proposals for ETS reform in July 2015. The Commission proposes that from 2020 the ETS total annual cap on CO₂ emissions will be reduced at a faster rate. There is also a complex compromise which continues to protect the position of industries which are both relatively carbon intensive and vulnerable to trade competition from outside the EU. The arguing will continue, as will the industry lobbying: decisions on the reform package are not expected until 2017.

There is clearly plenty of scope for improving the ETS. However, rather than add to the literature on that topic [2], this report focuses instead on the need to add additional policies to complement the ETS. There is also a danger that, by focusing discussion on the details of ETS design and implementation, we will lose sight of the bigger picture.

Notes

[1] EU Court of Auditors press release on EU Emissions Trading System, 2.7.15.
<http://www.eca.europa.eu/en/Pages/NewsItem.aspx?nid=5856>

[2] See for example Sandbag briefing on the ETS, July 2015.
<https://sandbag.org.uk/reports/discharging-a-political-storm-supporting-eu-competitiveness-and-innovation-in-the-ets/>

The global context

Any decisions on policy options for the EU have to take into account the global context: climate change itself, of course; international processes of negotiation and co-operation (or lack thereof); and issues around trade, international competitiveness, and the offshoring of production.

The global context has recently shifted in three important ways. Paradoxically, some countries have reacted to increased global pressure for action on climate change by stepping up their fossil fuel production, in the expectation that future measures will discourage or limit its use. The greater the pressure for action becomes, the more urgently they seek to “make hay whilst the sun shines.” Of course, this is highly dangerous, but in a longer-term perspective it is a sign of international opinion moving in the right direction.

Secondly, the movement to divest from fossil fuel companies has gathered pace, with a far greater recognition of fossil fuels as “stranded assets,” which will decline in value if and when effective action is taken to limit emissions. Given the importance of fossil fuels as an economic sector, and the spread of investments in them across banks, pension funds, and so on, there is now a growing understanding that they represent a massive asset bubble, which could either burst dramatically or perhaps be gradually let down. This is in itself a major task for government policy, in addition to the question of how to limit carbon emissions themselves. [1]

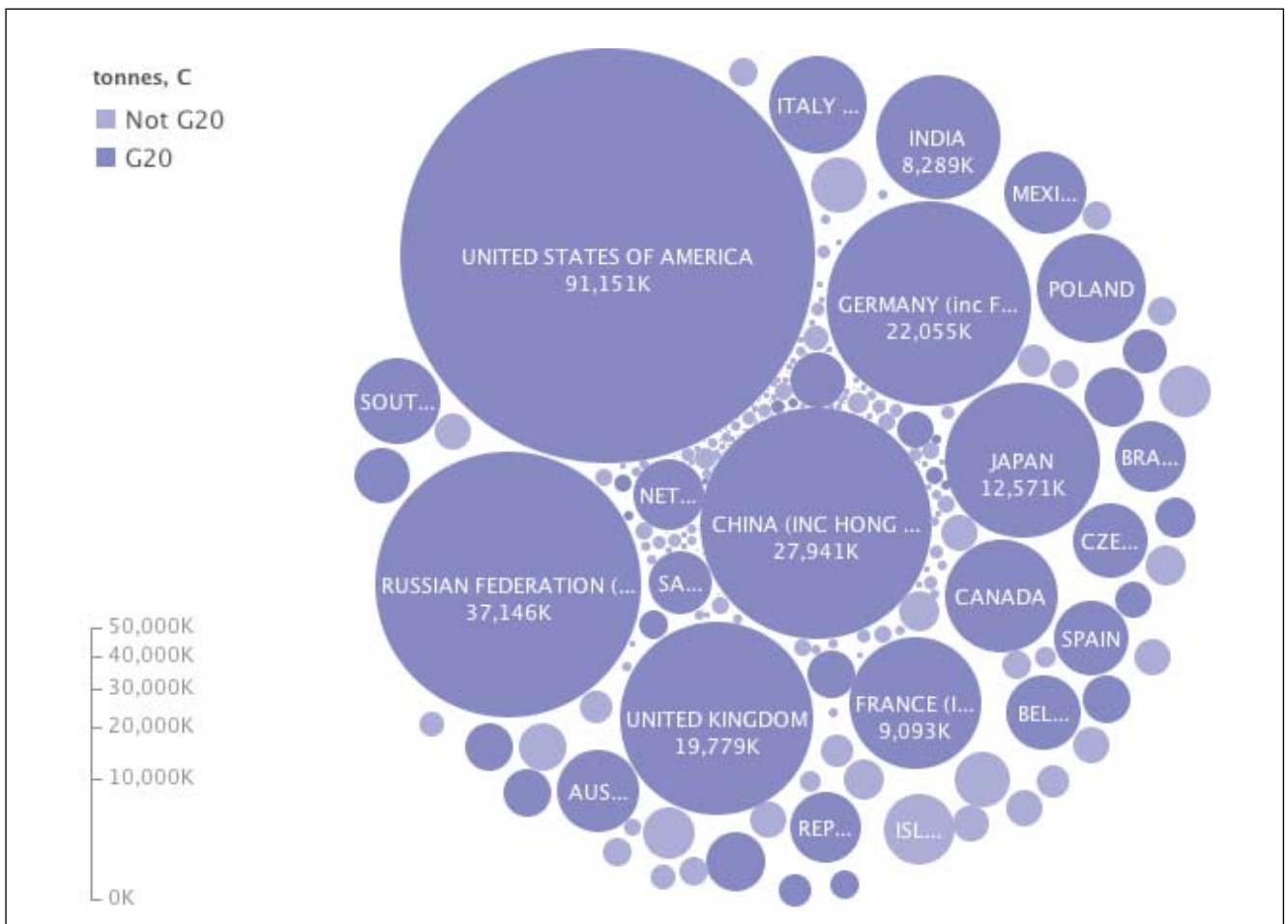
A third important shift is that the word “negotiations” appears less and less accurate. There is not a lot of bargaining taking place, whereby one country gives something up in return for gaining something from another country – other than on the issue of finance. In its place we have countries imitating each other, co-operating with each other, listening to scientific advice to a certain extent, and competing for ‘first-mover’ economic advantage and/or the moral or political high ground. There are plenty of talks going on, but to call all of them ‘negotiations’ is misleading.

A continuing feature of international talks on climate change is the number and significance of links to talks on other issues. It is difficult, for example, to respond to climate change solely by discussing fossil fuel emissions and without considering land use change and deforestation. The impact of carbon emissions on climate also needs to be considered alongside their impact on the oceans through ocean acidification. Questions about climate science are closely linked to other questions about the role of scientific advice in policy-making, and the supposedly ‘scientific’ status of disciplines such as economics and approaches such as cost-benefit analysis. Issues of energy efficiency and the development of renewable energy are closely linked to questions about patents, intellectual property rights, and technology transfer.

Climate change is also included in the set of “planetary boundaries” identified in some influential scientific analyses of the planet [2], and in the new set of Sustainable Development Goals intended to guide the world community from 2015 to 2030. [3]

Economic inequality provides the most important link to what might at first sight appear to be “other issues.” This is because of the very close connection historically between economic growth and the consumption of fossil fuels. The industrial revolution, which began in parts of western Europe and then spread around much of the rest of the world, was founded on coal. Later the world’s economies were given a further boost by oil. As a result, for a long time it was very difficult to envisage a path of economic development which did not involve the use of increasing quantities of fossil fuels. Hence any suggestion of an agreement to restrain carbon emissions has looked like a suggestion to limit economic development. The governments of poorer and ‘developing’ countries then see themselves as being asked to limit their economies, and therefore their population’s chances of escaping poverty and achieving prosperity; all in order to solve a problem created by the very countries which have already benefited from growth and economic prosperity based on fossil fuels.

Figure 3 Cumulative carbon dioxide emissions from G20 & non-G20 countries 1751–2006



Data source: CDIAC, doi10.3334/CDIAC/00001

Credit: Carbon Visuals

There is a basic unfairness here, which has always been at the heart of the difficulties in reaching international agreement on climate change. The sense of a “common good,” in which all share, is too weak in comparison to the sense that interests are in conflict, particularly between rich and poor. Any proposal to tackle climate change internationally must address this question if it is to have any chance at all of success. This includes the need for radical reductions in emissions in the richer parts of the world.

There is a related problem of ‘international competitiveness.’ Many companies lobbied for exemptions from the ETS, on the grounds that the increase in their costs would inevitably result in their charging higher prices, making their products less attractive to consumers. The steel industry of France, for example, might find it a struggle to compete with the steel industries of Brazil and South Korea, if the French had to pay for the ETS or Carbon Tax whilst their Brazilian and South Korean competitors were free of that additional cost. This is a powerful reality which trade negotiations and agreements need to address.

This global context generates a need for the EU to widen its range of policy responses. The next section makes the argument that there is a general requirement not to rely entirely on market-based instruments such as the ETS, and then discusses some of the more specific implications.

Notes

- [1] See Aled Jones et al.: ‘Resource Constraints: sharing a finite world’ (Institute and Faculty of Actuaries 2013).
<http://www.actuaries.org.uk/research-and-resources/documents/resource-constraints-sharing-finite-world-evidence-and-scenarios-fu>
- [2] See Johan Rockstrom et al.: ‘Planetary Boundaries: Exploring the Safe Operating Space for Humanity’ (Ecology & Society 2009).
<http://planetaryboundariesinitiative.org/wp-content/uploads/2013/10/PB-Exploring-the-Safe-OPERating-Space-for-Humanity-2009.pdf>
- [3] <https://sustainabledevelopment.un.org/post2015/transformingourworld> (2015).

Beyond market-based policies

Why market-based instruments are not enough

It is easy to assume that what is needed to remedy the deficiencies of the ETS must be either a reform or a switch to some similar policy, again using the price mechanism to restrain fossil fuel use and carbon emissions, perhaps through a Carbon Tax. However there are many good reasons for questioning the adequacy of this approach.

Government, including local and regional government, influences planning, development, and transport infrastructure, creating the context within which consumers and firms make many of their decisions. Price shift policies alone may not significantly change this; for example, a policy of reducing bus fares where the geographical distribution of houses, shops, etc, has made running bus services uneconomical and non-existent.

The public sector in nearly all countries has large amounts of resources at its disposal. Allocation of government expenditure can proceed regardless of market incentives. Government is often the largest funder of research and training, which firms may be reluctant to provide for themselves, due to their fear that research will benefit their competitors as much as the firm itself.

At the level of the individual consumer, although price incentives have an effect, this is usually far greater if accompanied by other factors favouring a change in behaviour or consumption; for example, easily accessible information about the existence of an incentive, some practical alternative (e.g. public transport instead of car use), and perhaps a 'framing' about meaning (e.g. that recycling is virtuous or public-spirited).

At the level of the firm, decisions often depend on expectations about what others will do. Discussion and co-ordination between firms, which can often depend on government giving the lead, can help to clarify matters and reduce risk.

Governments obviously have a key role internationally, in bargaining over policies or perhaps ensuring that they are consistent across national boundaries.

All of these powers of government can be mobilised and made use of in the fight against climate change.

Of course none of these points imply that market-based instruments should have no role at all to play. We need to consider ideas for sets of policies based on a balance between different types of instruments and good ways of combining them. Later in this report, I will be proposing a policy package of that sort.

International Stern

The recent report of the Global Commission on the Economy and Climate - often known as “the international Stern Report” – is a very good starting point for considering a range of emissions reduction policies which are “direct” rather than “market-based”, in the sense that they do not rely on the workings of the price mechanism.

This report is used simply as an illustration – a useful one because of the thoroughness of the research that went into it, the wide range of aspects it considers, and the amount of attention it has received – rather than because it is part of my argument to endorse all its details. It is important to note that only two of its ten key recommendations (numbers 4 & 5) are concerned with the price mechanism.

The report, ‘Better Growth, Better Climate’ (2014) proposes this 10-point Global Action Plan:

1. Accelerate low-carbon transformation by integrating climate into core economic decision-making processes. This is needed at all levels of government and business, through systematic changes to policy and project assessment tools, performance indicators, risk models and reporting requirements.
2. Enter into a strong, lasting and equitable international climate agreement, to increase the confidence needed for domestic policy reform, provide the support needed by developing countries, and send a strong market signal to investors.
3. Phase out subsidies for fossil fuels and agricultural inputs, and incentives for urban sprawl, to drive more efficient use of resources and release public funds for other uses, including programmes to benefit those on low incomes.
4. Introduce strong, predictable carbon prices as part of good fiscal reform and good business practice, sending strong signals across the economy.
5. Substantially reduce capital costs for low-carbon infrastructure investments, expanding access to institutional capital and lowering its costs for low-carbon assets.
6. Scale up innovation in key low-carbon and climate-resilient technologies, tripling public investment in clean energy R&D and removing barriers to entrepreneurship and creativity.
7. Make connected and compact cities the preferred form of urban development, by encouraging better-managed urban growth and prioritising investments in efficient and safe mass transit systems.
8. Stop deforestation of natural forests by 2030, by strengthening the incentives for long-term investment and forest protection, and increasing international funding to around US\$5 billion per year, progressively linked to performance.

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9. Restore at least 500 million hectares of lost or degraded forests and agricultural lands by 2030, strengthening rural incomes and food security.
 10. Accelerate the shift away from polluting coal-fired power generation, phasing out new unabated coal plants in developed economies immediately and in middle-income countries by 2025.”

Implications of the global context

Here it is important to revisit the issues raised in the earlier section on ‘The Global Context’. In particular:

- The international equity issue implies the need for more substantial reductions in EU emissions than are currently being planned for.
- The question of international trade competitiveness implies the need to give far greater attention to impacts on carbon emissions in the TTIP and other trade talks.
- The “stranded assets” (or “carbon bubble”) issue implies the need for an economic strategy for low-carbon transition which goes beyond simply looking at how to fund the new technologies. It also needs to look at how to manage the move away from the old fossil fuels without creating excessive economic disruption in the process.
- The planetary boundaries analysis implies a need to find some international forum to effectively address the other global carbon-related problem – ocean acidification – perhaps through adding it to the Climate Change Convention.
- Problems in economists’ use of discounting and income/GDP measures in cost-benefit analysis imply a need to look very carefully at issues of equity in the way economic calculations are carried out; that is, equity both internationally and between generations.
- The UN Sustainable Development Goals reinforce the importance of addressing not only the greenhouse gas emissions aspect of climate change but also questions about land use change and deforestation.

Notes

- [1]The Global Commission on the Economy and Climate: Better Growth, Better Climate (2014). Executive Summary pages 3 & 4. www.newclimateeconomy.report

Market-based policies

There are essentially two basic types of “market-based” policy. One involves setting the price of carbon emissions permits through a decision by government (or affecting the price through a tax rate set by government). The other type of policy involves some process of auctioning, or allocation with trading allowed, whereby the total level of emissions is set by government, but the price is then set by market forces.

The first approach is in a sense a clearer policy, because the price (or the tax additional to the market price) is known in advance. However, that type of policy is less clear in its consequences: unless the demand curve is known precisely in advance, the impact of a particular price or tax on consumption – and therefore on the emissions total which we are interested in – is uncertain.

Alternatively, a process of auctioning or allocation can be designed, with a fixed total as the starting-point. It is then certain what the outcome will be (or at least, considering the possibility that some permits might remain unused, certain what the maximum level of emissions will be under such a policy).

Auctioning has the political advantage, as the ETS did, of appearing to take away direct political responsibility for the particular price or tax that is charged. Responsibility would only need to be taken for prudently setting the total emissions level, which would be based on well-grounded scientific advice, again reducing the degree of politicisation involved.

But is this line of argument leading back to staying with something like the ETS? That was a policy in which politicians took decisions about totals, allocations, and the permission to sell on permits, with the market setting the price. Are there other ways of doing this?

In fact, a variety of proposals have been put forward. Here I focus on four in particular, which, between them, raise the main relevant issues. I start with the more ‘mainstream’ concept of a Carbon Tax, and look at some of the questions it raises. I then look at three other proposals, all of which were designed as responses to problems with Carbon Tax. The first, put forward by James Hansen, has quite a lot of support, particularly in the USA, and is a tax-based system with a strong redistributive element. The second, put forward by the Feasta think-tank, is a good example of an auction-based system. The third, Carbon Quotas, advocated by Mayer Hillman and others, has a focus on individual allocations (“rationing”).

The consequences of Carbon Tax

Compared to the other policies, the idea of a Carbon Tax is much more in line with ordinary ways of thinking about government intervention to disincentivise undesirable behaviour. The principle is simple: tax it. A Carbon Tax involves no complications about auctions or other principles of distribution, or the trading of permits. It operates in the way that other taxes do.

A Carbon Tax is a tax on carbon-based fossil fuels which is levied according to the quantity of carbon emitted. The tax per unit of volume of a fuel depends on the carbon content of that fuel.

A Carbon Tax is therefore directly targeted at that which the policy intervention is intended to disincentivise: consumption which results in carbon emissions. Standard economic theory predicts, realistically, that the impact of this would be shared between some increase in the price paid by the consumer and some reduction in the quantity consumed.

Although the principle of Carbon Tax is simple, some of its consequences are not. Most obviously, the tax (unlike some of the other proposals) does not start from a fixed limit on total emissions. The impact of the tax on the prices paid by consumers, and then the impact of those price rises on the amounts consumed, and therefore on the contribution of fossil fuel use to emissions, are matters for prediction. They are not known with any certainty. For example, an upturn in the rate of economic growth could at the same time boost demand for fossil fuels, making any reductions resulting from the tax uncertain or non-existent.

Carbon Tax, like any tax, has a distributional impact. That means that its effects can be different at different points along the income scale. Poorer people tend to consume more fossil fuel per unit of their income than richer people do. Therefore a tax on fossil fuels will represent a larger proportion of a poorer person's income than a richer person's income. This is described as a "regressive" tax. The result might be lower carbon emissions – but at the expense of the poor. The tax would have to be redesigned (or accompanied by other measures) to avoid this effect.

Perversely, at the same time as acting as a disincentive on consumers, a tax can also act as an incentive on governments. Carbon Tax could become a major source of revenue, which governments might get used to receiving. Any tendency which reduces the revenue from the tax – such as its effectiveness in discouraging fossil fuel consumption – will mean that governments are pushed into public spending cuts, borrowing increases, and/or raising other taxes to compensate, all of which they may be unwilling to do. The tax may end up being pitched at the level which produces maximum revenue for government, rather than maximum impact on carbon emissions.

The disincentive effect of the tax on fossil fuel consumption is not only uncertain but is dependent on other factors, which point to the need for additional measures to accompany the tax. One factor is information: incentives and disincentives don't work very well if people don't know about them. There should be an effort to publicise not only the existence of the tax, but also its implications for the total cost over the lifetime of, for example, an electrical appliance. There is a general tendency for consumers to focus on initial purchase costs rather than total running costs.

The other important factor here is the existence of alternatives. Disincentives are effective when there are alternatives consumers can opt for instead. For example, measures to restrain car use are far more effective if public transport alternatives exist and are boosted at the same time. Where this doesn't happen, most consumers simply pay the higher prices and consumption levels remain much as they were before.

In the case of fossil fuel use, the main alternatives which need to be in place are the more energy efficient options, and renewable energy sources. This in turn implies that Carbon Tax is not a substitute or replacement for policies to boost efficiency and renewable energy, but actually requires such policies in order to be effective. This conclusion is in contrast to the views of some advocates of Carbon Tax, who see it as a market-based instrument which removes any need for further forms of government intervention.

The argument for the provision of alternatives to accompany the tax is strengthened further by the issue of public acceptability. Public opinion surveys show that many people are suspicious or cynical about taxes which they see as being used to increase general government revenue, where they can't see how the money is being spent. However, where there is a credible guarantee that the money raised will be used for a specific useful purpose, particularly one which is directly related to the tax, then public acceptability increases. For example, in London in 2000, this was the basis of the policy of using money from traffic congestion charges to subsidise bus fares.

All of these issues concerning the consequences of Carbon Tax make it far less simple as a policy than it may first appear. They also draw attention to some of the deficiencies in economic theorising which relies completely on the actions of market forces; the need to provide alternatives, the distributional impact, and the existence of the political will and public acceptance necessary to introduce the tax and pitch it at a sufficiently high rate.

Within the EU, there is a further complicating political factor. Both an EU-wide tax and an EU-wide agreement to introduce national Carbon Taxes imply a substantially larger role for the EU in designing tax systems than many member states are prepared to accept. Such measures could be seen as steps towards fiscal union. This was one of the reasons for the introduction of the ETS in the first place, following the rejection of the European Commission's 1992 proposal for a European Carbon Tax.

ETS was a response to difficulties with Carbon Tax. So were the three other proposals for market-based policies which I will outline below.

The Hansen proposal

The proposal put forward by Dr James Hansen is known as 'Fee and Dividend'. Hansen is Director of the NASA Goddard Institute for Space Studies in the US. Largely because of his personal prominence in the scientific debate about climate change, his proposal has gathered a lot of attention.

The 'Fee' part is a charge applied to oil, gas and coal when it is mined or (if extracted in a country which does not itself charge the fee) when it enters a country as an import.

The fee would be designed to raise the price of fossil fuels. It would therefore not be a set tax rate: when world market prices for fossil fuels fall, the fee would need to rise in order to maintain the disincentive effect.

The fee does not involve a complex theoretical calculation as to its optimum level. The most important point is simply to get the scheme in place, even if initially at a low level. The fee should then be increased, on the basis of scientific advice, to a point where it has a very substantial impact on the rate of carbon emissions. At the same time, any government subsidies for fossil fuels would be eliminated.

What is most distinctive about the Hansen scheme is the 'Dividend' part. Hansen is aware that the public does not want to pay out more for its energy, and a powerful combination of people on below-average incomes and people who want a more equal distribution of income will object to any tax or fee scheme that has a regressive impact. There is also some public suspicion about the idea of revenue from a scheme intended to combat climate change simply disappearing into general government funds.

The dividend proposal responds to these points, by returning the revenue raised from the fee back to the public in the form of a standard dividend. This would be on an equal adult per capita basis, so people who use below average quantities of fossil fuels (who tend also to have lower than average incomes) would get a net financial benefit from the scheme, whilst those who would lose out financially would be people using above average quantities of fossil fuels. There are, however, bound to be some administrative costs involved in running the scheme, which would result in a small net financial loss on average. In the long run, of course, everyone would benefit from a more stable global climate.

This proposal is being campaigned for by the Citizens' Climate Lobby, based in the USA but with chapters in other countries as well, particularly Canada and Australia. [1]

'Fee and Dividend' has the advantage of being a very clear scheme, and easy to defend as fair. As the fee would apply across all economic sectors, it would avoid the scope for loopholes and exceptions which has led to

such a large amount of lobbying by companies attempting to avoid the ETS. However, this plan does nothing to raise revenue for government expenditure on public transport, building insulation, renewable energy and other schemes to reduce carbon emissions in more direct ways.

The Feasta proposal

The proposal put forward by the Feasta think-tank in Ireland has some similarities with the Hansen plan, and has been described as ‘Cap and Dividend’. [2] There would be a charge levied on the carbon content of fossil fuels (rather than on the emissions), and the revenue would later be redistributed.

The fee levied would be determined through auction, which would be the auctioning of licenses for fossil fuel extraction. The total number of licenses (denominated in units of carbon) each year would be determined on the basis of scientific advice, and expected to reduce steadily.

A striking feature of the plan is that it does not require an intergovernmental global regulator, which some have seen as necessary to any strengthening of existing arrangements beyond the Kyoto Protocol. An organisation along the lines of a trust – a Global Commons Climate Trust -would create the licenses and carry out the auctions. Governments would then simply need to opt into the scheme (or be required to do so through action in the courts) through agreeing to ban the production and import of unlicensed fossil fuels. There would be no need for a conference at which all governments would agree to sign up simultaneously: the scheme could grow gradually.

The scheme would be global in the scope of its ambition, and so the distribution of proceeds from the license auctions would also be global. This would create a major net transfer of income from high users of fossil fuels (predominantly in the richer countries) to people in poorer countries. This should help overcome what has been up until now one of the most important stumbling blocks in international negotiations on climate change; the sense amongst governments of poorer countries that their economic development and incomes may be held back, as a result of unfair measures taken to combat a problem which they played no part in causing.

This proposal has the advantage that it puts the initiative in the hands of citizens, who are called on simply to set up a licensing institution and get started on licensing and auctioning, without waiting for governments to take the first step.

Whilst this aspect of the proposal is attractive, the contrast drawn with government-led schemes is overstated, because the licenses will be worthless unless governments buy into the scheme. In practice, therefore it would not avoid the need for action from politicians and governments.

The Carbon Quotas proposal

Many people find the Carbon Quotas proposal shocking, because it directly confronts each of us with the reality of climate change and its implications. Rather than leaving us to imagine apparently remote intergovernmental processes, this proposal brings the issue home to everyone by suggesting that we should each have an individual carbon quota. This can accurately be described as a form of rationing.

A total for carbon emissions would be calculated on the basis of scientific advice. These emissions would then be divided up amongst countries on the basis of 'Contraction and Convergence'. This means that there would eventually be an equal per capita allocation, but this would be phased in gradually, moving steadily from the current distribution of emissions to equal rights to emit. The national allocations would then be divided up on an equal per capita basis within each country. [3]

The permits issued as a result would then be tradable. Again, this scheme would be redistributive in its consequences. Poorer people not wishing to use up their full quota would sell some of their permits in order to receive an income. Richer people wanting to emit a lot of carbon would end up paying for it: in a sense, paying for using more than their fair share of a major global commons, the atmosphere. [4]

A variation on this proposal has been put forward under the title of "Tradeable Emissions Quotas" (TEQs). According to this scheme, 40% of emissions permits would be allocated on an equal per capita basis to all adults, with the other 60% auctioned off to organisations, including public bodies and businesses. [5]

[1]<https://citizensclimatelobby.org/carbon-fee-and-dividend/>

[2]John Jopling: 'CapGlobalCarbon' (Green House 2015). http://www.greenhousethinktank.org/files/greenhouse/admin/s_Green_House_gas_FINAL_28_FEB_2015.pdf See also <http://www.capglobalcarbon.org/>

[3]Mayer Hillman: 'Adapting to the environmental imperatives of climate change' (University of Sussex 2011)

[4]Mayer Hillman & Tina Fawcett: 'How we can Save the Planet' (Penguin 2004).

[5]Shaun Chamberlin, Larch Maxey & Victoria Hurth: Reconciling scientific reality with realpolitik: moving beyond carbon pricing to TEQs (2015) <http://www.teqs.net/CarbonManagementPaper.pdf>

‘Hansen plus Stern’: a proposal

The ETS has secured widespread support within the EU. To campaign against it is to risk dismantling an inadequate policy, only to be left with no substantial policy at all – which would obviously be even more inadequate. This report has therefore argued that there is a need for additional policies, rather than the abandonment and replacement of the ETS.

What should those additional policies be? The various proposals outlined earlier provide some background for making choices. The foundation of what I am advocating here could be described as “Hansen plus Stern.” I will explain this, and why I suggest that both elements are necessary.

What is most important, however, is simply that effective action is taken. The details of the schemes through which this can be achieved are far less important. Schemes which have political support and momentum often have a greater chance of success than the more theoretically “perfect” schemes which lack support. It is therefore unwise to be dogmatic about the details. However, with that caveat, I will suggest the outlines of a set of proposals which may at least overcome the deficiencies of the EU ETS.

The importance of what I describe as the “Stern” aspect is the emphasis on policy measures which do not depend entirely on the use of the price mechanism. There is a need for government investment, for example in public transport, updating electricity distribution systems, house insulation, and low-carbon technological innovation. Attention is needed for tropical forests, and more generally for carbon sinks, so that not all policy is geared towards the emissions side. Governments should phase out fossil fuel subsidies, freeing up money for low-carbon investment, and preventing these subsidies from undermining the “Hansen” aspect of the scheme.

These are examples. They can be added to, and they don’t have to correspond exactly to the proposals in the report of the international Stern Commission. We could, for instance, add to the list a moratorium on airport expansion (which, in the UK, would apply to both Gatwick and Heathrow, currently positioning themselves as rivals for expansion).

The key point here is a rejection of the view that some economists have put forward, that if the price of carbon is “right,” the market will ensure that everything else falls into place. In contrast, there is also a need for determined government action, including public investment.

The “Hansen” part of the scheme is the “Fee and Dividend” proposal discussed earlier. The ‘Fee’ is a charge applied to oil, gas and coal when it is mined or (if extracted in a country which does not itself charge the fee) when it enters a country as an import. This would be pitched at the level necessary to achieve carbon emissions reductions at the pace and on the scale recommended by climate scientists. There would be no exemptions for carbon-intensive economic sectors, as exemptions reduce the effectiveness of the policy. However, in an initial period, the level of the

fee could be relatively low, to be increased gradually, so as to encourage an orderly process of transition.

The 'Dividend' aspect of the Hansen proposal is an equal per capita payment to all adult citizens. However, this needs to be modified by the "Stern" element in this scheme, because the latter will require large amounts of money for investment, in addition to what can be raised through the phasing out of fossil fuel and other damaging subsidies.

The proposal here is to divide the revenue in half, with half going as a money dividend to citizens, which would to some extent compensate people for any financial losses. The other half would go into government expenditure on proposals of the sort advocated by Stern. Many of these proposals would also be of direct financial benefit to citizens, such as an insulation programme which would reduce fuel bills, so these could be seen as another form of dividend, despite not being direct cash payments.

In addition, there is a need to consider two sources of emissions which can escape restrictions if policy-making is too nationally focused: international aviation and shipping. Both of these were exempt from the Kyoto Protocol and therefore have not shown up in most national emissions statistics. However, they are major and growing sources of greenhouse gases. This is where a straightforward Carbon Tax would be appropriate, operated internationally, with funds from taxing aviation and shipping going to developing countries to assist them in low-carbon transition, including forest conservation.

Conclusion

In summary, what is advocated here is:

- The retention and improvement of the ETS
- A “Stern” element: mainly government expenditure on emissions reductions
- A “Hansen” element: auctioned permits, with a dividend returned to citizens
- Carbon Tax on international aviation and shipping

We are now in a situation where both the science and the political rhetoric surrounding climate change are a long way in front of the real impact of government policies and international agreements. As a result many people feel far more impacted by climate change policies than they actually are.

The imagined pain from the policies therefore becomes far greater than their actual effectiveness. That is a cost without sufficient benefit.

This form of tokenism in policy does have some benefit, however. It starts to embed an issue in people’s minds, both amongst the general public and ‘policy makers.’ It starts to produce the establishment of institutions, mechanisms, data collection, discussion networks, research projects, individual behaviour change and so on, each of which can be developed further.

The UN Framework Convention on Climate Change, the Kyoto Protocol, and the EU Emissions Trading System – whilst being useful steps forward – all have something of that character. They have all helped to open up the issues involved. But now we urgently need to move to the next stage.