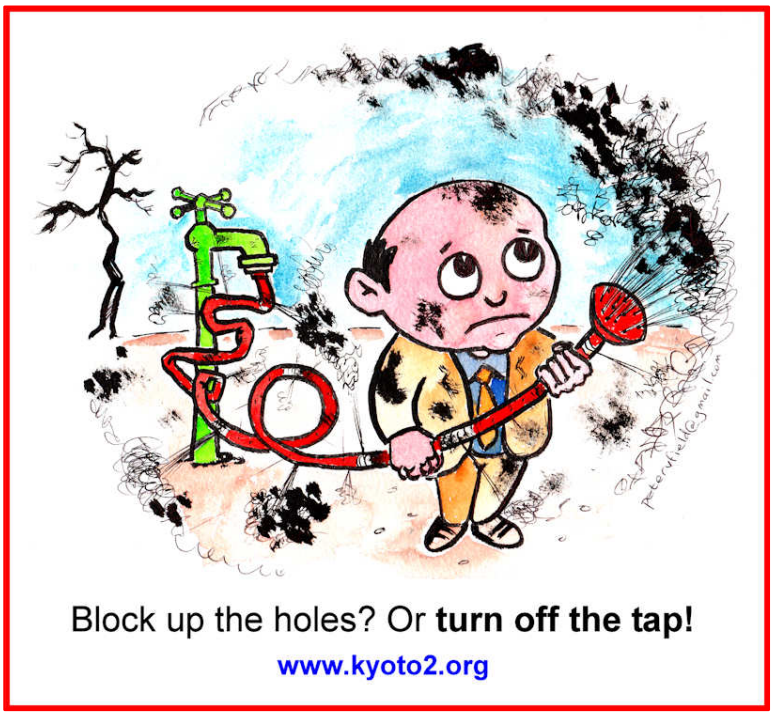
‘Upstream’ reform of the EU Emissions Trading System[1]

May 2012



1 Introduction

An analysis published recently by the Royal Society, London,[2] warns that, *without radical action, we are likely to pass the threshold between ‘dangerous’ and ‘extremely dangerous’ climate change.* But the EU Emissions Trading System is producing only small cuts in emissions,[3] it is vulnerable to fraud,[4] and it has several other problems.[5]

A simple reform would largely solve these problems: *control fossil carbon ‘upstream’ at the relative handful of places where coal, oil and gas come out of the ground, instead of trying to control CO_2 ‘downstream’ at the much larger number of emissions-producing businesses.* Supporting evidence and arguments may be found in [K2S 2010] and [Tickell 2008].

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[1] An electronic version of this document, with live links, may be downloaded from http://www.mng.org.uk/euets.

[2] “Beyond dangerous climate change: emissions scenarios for a new world”, Kevin Anderson and Alice Bows, *Philosophical Transactions of the Royal Society A*, 369 (1934), 20-44, 2011, doi: 10.1098/rsta.2010.0290, http://rsta.royalsocietypublishing.org/content/369/1934/20.abstract.

[3] See, for example, http://www.guardian.co.uk/environment/2010/sep/10/eu-emissions-trading-savings and “EU Emissions Trading System: failing at the third attempt” (a briefing from Corporate Europe Observatory, Carbon Trade Watch, April 2011, http://www.corporateeurope.org/system/files/files/article/EU-ETS_briefing_april2011_0.pdf).

[4] See, for example, http://online.wsj.com/article/SB10001424052748704881304576093383625187362.html.

[5] See, for example, http://www.k2support.org/euets-problems.

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Upstream reform of the EU Emissions Trading System would bring two main benefits:

- It would dramatically improve the workings of the EU ETS itself, as described below.
- By raising awareness of the upstream approach to the control of emissions, by demonstrating its advantages, and by providing incentives for other countries and regions to adopt upstream controls, it would pave the way for the creation of a global system of upstream controls.

Similar remarks apply to any non-EU country or region that may be considering introducing a cap-and-trade system for industrial greenhouse gases:

- Adoption of the upstream model would bring several benefits and would avoid the pitfalls of downstream controls.
- As with upstream reform of the EU ETS, adoption of the upstream model would help pave the way for a global system of upstream controls.

In what follows, we shall consider how upstream reform of the EU ETS may be done, and the potential benefits.

2 Upstream reform of the EU ETS

At present, the focus of the EU ETS is on controlling emissions from energy-intensive installations across the EU.[6] The main changes that would be needed to convert the EU ETS into an upstream system are:

- Instead of issuing allowances to emissions-producing businesses:
  - Permits would be required to extract coal, oil or gas from the ground within the EU.
  - Permits would be required to import coal, oil or gas into the EU, unless the imports came from a country or region operating a compatible system of controls.[7]
- Each year, there would be an auction of permits, and permits may be traded.[8] Options for how to use the money raised from the sale of permits are outlined in Section 2.2, below.
- The number of permits issued each year would be determined from the best available scientific assessment of the cuts in emissions that are needed to minimise the risk of dangerous climate change.[9]
- There would be mechanisms to inhibit excessive spikes or troughs in the price of permits, as described in [Tickell 2008].

2.1 Border levelling

To ensure that EU businesses can compete on a level playing field with businesses outside the EU, 'border levelling' measures will be needed:

[6] Those installations produce nearly half of Europe's emissions of CO_2

[7] It is not essential that all countries and regions should adopt precisely the same system. Although we believe that the Kyoto2 proposals are a good basis for a worldwide system, we can see the merits of other upstream proposals such as 'Cap and Dividend' that has achieved some political traction in the USA. Providing there is a reasonable degree of compatibility between two systems, border-levelling measures between them would not be needed.

[8] We believe that the practice of giving away permits for nothing ('grandfathering') is not satisfactory and that auctioning of permits is an overdue reform. Any possible justification for grandfathering as a means of safeguarding the competitiveness of EU businesses (as described in [Carbon Trust 2010, Section 7]) would be no longer relevant if the border-levelling measures in this proposal were adopted.

[9] We believe this is another reform of the EU ETS which is overdue. If we are to minimise the risk of dangerous climate change, emissions must be capped and reduced at a rate that is determined by science, not negotiation.

- Permits would be required for the import of cameras, cars etc into the EU to reflect the fossil carbon that is 'embodied' in them. There should probably be a range of rates, depending on the type of product and the amount of fossil carbon used in its production. As before, there would be exemptions for imports from any country or region operating a compatible system of controls.
- All exports from the EU would be credited with permits at the same rates, and with the same exemptions, as would apply to the corresponding categories of imports.

In case anyone should object that these border-levelling measures add unreasonable complexity to the proposal:

- It is likely that equivalent measures would be required with the existing scheme to combat the problems of unfair competition and leakage (see Section 3.5).
- With the creation of a global system of upstream controls, border-levelling measures would not be needed.

If border levelling measures are to be introduced into the EU ETS, it would make sense for upstream reforms to be introduced at the same time. Introducing charges for imports already takes us half way towards an upstream system. Completing the reform would yield an overall simplification of the system and a range of new benefits, described below.

2.2 Uses for funds

Since the whole *raison d'être* of the EU ETS is to fight climate change, we believe that it is appropriate that moneys raised by the auctioning of permits should go into a 'Climate Fund' for that purpose, as described in [Tickell 2008]. In view of the fact that richer countries, including countries in the EU, now accept that they should provide funds for mitigation and adaptation in poorer countries, the sale of permits would be a relatively painless way of raising the necessary money (see Section 4.2).

No doubt, national treasuries will object that this is 'hypothecation' and wish to treat the money as general taxation. Another option is to return all the money to citizens, as is proposed in James Hansen's 'Fee and Dividend' scheme[10] and in 'Cap and Share'[11] and 'Cap and Dividend.'[12] There is probably a case for earmarking some of the money for a 'Social Fund' to alleviate any possible hardship amongst poorer people that may arise in the transition to clean technologies. And, of course, those kinds of options may be combined in various ways.

3 Direct benefits for the workings of the EU ETS

To date, the EU ETS has had little or no effect in reducing emissions.[13] As described in the following subsections, the proposed reforms would largely eliminate problems in the system as it is now and would provide much more effective control of emissions of CO_2 and other industrial greenhouse gases.

3.1 Budget discipline: comprehensive controls on industrial greenhouse gases

Upstream reform of the EU ETS would, in one step, achieve control over 100% of fossil carbon used in the EU, instead of less than 50% with the system as it is now. Emissions from trains, road vehicles and buildings would come within the scheme. As mentioned above, there may be a role for a 'Social Fund' to help smooth the transition.

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[10] See *Storms of my grandchildren*, James Hansen, London: Bloomsbury, 2009.
[11] See http://www.capandshare.org/.
[12] See http://www.capanddividend.org/.
[13] See "EU emissions trading scheme on course to make tiny savings, says report," The Guardian, 2010-09-10, http://www.guardian.co.uk/environment/2010/sep/10/eu-emissions-trading-savings.

Given the need to control all kinds of industrial greenhouse gases and not just CO_2, it will be simpler to achieve this in a system of upstream controls than with the present downstream system.

Without comprehensive controls on industrial greenhouse gases, it will be impossible to exercise the budget discipline which climate scientists say is needed to minimise the risk of dangerous climate change.[14]

3.2 Raising the price of fossil carbon

With the EU ETS as it has been operating to date, there are concerns that the price of CO_2 emissions is still too low and does not provide a strong enough incentive for the introduction of green alternatives.[15] The reforms proposed in Section 2 would go a long way towards raising the price of CO_2 emissions to their proper level. The main reasons are:

- All permits would be auctioned.
- As described in Section 3.1, all emissions of 'fossil' CO_2 would be controlled, not just those from energy-intensive businesses.
- With explicit recognition that the permits that are issued each year should be determined in the light of climate science, there would be less temptation to issue too many permits than with the present discretionary system, and the influence of powerful lobbies would be reduced.
- In the Kyoto2 proposals [Tickell 2008], it is a straightforward matter to put a floor on the price of fossil carbon.

With realistic prices for fossil carbon, there would be less need for subsidies and special schemes to support the development of renewable sources of power and conservation of energy.

3.3 Reduced opportunities for fraud

The relative simplicity of controlling fossil carbon at or close to its origins should reduce the opportunities for fraud.[16] Even if criminals managed to get hold of a supply of permits, there would only be the relatively few operators of coal mines, oil wells and gas wells that would have a need for them. Providing that each permit has a unique identifier and is valid for only one year, selling stolen permits would be difficult in much the same way that it is difficult to sell stolen paintings that are well known.

3.4 No need for a Clean Development Mechanism or Joint Implementation

In the Kyoto Protocol, the CDM and the JI were introduced as 'flexibility mechanisms' so that any country, in attempting to meet its targets for reductions in emissions, would have the option of promoting emissions-reduction projects outside its own borders and could thus save money where appropriate opportunities arise.

In the EU ETS, emissions-producing businesses have the option of meeting some of their obligations via the CDM or the JI. However, with upstream controls on emissions there are no emissions allowances for businesses and thus there is no place for the CDM or JI. With upstream controls, the

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[14] See "Solving the climate dilemma: the budget approach", German Advisory Council on Global Change (WBGU), Berlin, 2009, http://www.mng.org.uk/gh/private/wbgu_sn2009_en.pdf; and *Storms of my grandchildren*, James Hansen, London: Bloomsbury, 2009..

[15] See, for example, "MPs propose carbon tax to boost green investment," The Guardian, 2010-02-08, http://www.guardian.co.uk/environment/2010/feb/08/carbon-emissions-trading-system.

[16] See, for example, "EU says 2 million emissions permits missing after theft" (Wall Street Journal, 2011-01-20, http://online.wsj.com/article/SB10001424052748704881304576093383625187362.html) and "European carbon market suspended over fraud fears" (Daily Telegraph, 2011-01-19, http://www.telegraph.co.uk/finance/newsbysector/energy/8269907/European-carbon-market-suspended-over-fraud-fears.html).

goal of economic efficiency in reducing emissions is served via the global auctioning and trading of permits.

Removing the need for the CDM and JI would have two main advantages:

- It would eliminate the need for such things as 'Certified Emissions Reductions', 'Emissions Reduction Units' and 'Assigned Amount Units' and their associated complexities.
- It would sidestep several problems that have arisen with the CDM: the problem of 'additionality,' perverse incentives, spurious accounting, opportunities for fraud, credits for projects that are not effective, and more.[17]

A possible objection is that, despite its problems, the CDM has not been entirely without success in promoting green technologies in developing countries. However, it appears that any shortfall in funding from there could be more than offset via funds raised from the sale of permits, as described in Section 4.2.

3.5 Solving the problems of unfair competition and leakage

The EU ETS is intended to raise the price of CO_2 emissions and, to the extent that it is successful, it will cause CO_2-emitting businesses in the EU to be at a commercial disadvantage compared with competitors outside the scheme or any compatible scheme for controlling emissions. There is a risk that the production of goods within the EU will be replaced by imports or that production will be moved to areas outside the EU where controls are less stringent. It appears that this problem of 'leakage' is particularly severe for high-emissions businesses such as the makers of steel or cement [Carbon Trust 2010, Dröge 2009].[18]

One of the advantages of a global system of upstream controls is that it does not create problems of unfair competition and leakage.

Pending the creation of a global system, and with upstream controls in an area like the EU, the border-levelling measures in this proposal (Section 2.1) will ensure that there is a level playing field for businesses within the EU and would eliminate ETS-related problems of unfair competition and leakage. As mentioned in Section 2.1, border levelling makes much better sense in an upstream system than it does in a downstream system.

3.6 Solving the problem of 'import emissions'

When a country like China exports products to a country like the UK, then it would seem fair that the people who buy those products should take responsibility for the corresponding emissions of CO_2. But, as things stand now, the responsibility for the emissions lies with China.[19]

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[17] See, for example, "Carbon offset: controversies," http://en.wikipedia.org/wiki/Carbon_offset#Controversies, "Clean Development Mechanism: concerns," http://en.wikipedia.org/wiki/Clean_Development_Mechanism#Concerns and CDM Watch, http://www.cdm-watch.org/.

[18] See also "UK steel and chemical industries could be driven out of Britain if Coalition doesn't axe some green taxes, claims CBI boss" (Mail Online, 2011-06-16, http://www.dailymail.co.uk/news/article-2003907/UK-steel-chemical-industries-driven-Britain-Coalition-doesnt-axe-green-taxes-claims-CBI-boss.html); "British industry rebellion over carbon targets" (Sunday Times, 2011-05-22, http://thegwpf.org/uk-news/3059-british-industry-in-rebellion-over-carbon-targets.html); "Vince Cable and Chris Huhne clash over carbon emissions" (The Guardian, 2011-05-09, http://www.guardian.co.uk/politics/2011/may/09/vince-cable-chris-huhne-carbon-emissions?&); "EU carbon trading windfalls under fire from Lord Turner", Daily Telegraph, 2010-03-03, http://www.telegraph.co.uk/finance/newsbysector/energy/7354751/EU-carbon-trading-windfalls-under-fire-from-Lord-Turner.html;

[19] See, for example, "UK import emissions are the highest in Europe, figures show" (The Guardian, 2010-03-08, http://www.guardian.co.uk/environment/2010/mar/08/carbon-emissions-carbonfootprints). See also "China's increasing carbon emissions blamed on manufacturing for west" (The Guardian, 2009-02-23, http://www.guardian.co.uk/environment/2009/feb/23/china-carbon-emissions) and "UK's official CO_2 figures an

Trying to correct this problem of fossil carbon that is 'embedded' in manufactured products by keeping track of carbon through all stages in the production of every product would be an accounting nightmare. But with a global system of upstream controls on emissions, the problem simply disappears. The end user of any product would, directly or indirectly, pay the cost of permits needed at any stage in the production and distribution of that product.

With upstream reform of the EU ETS, the same would apply to the trading of products between countries within the EU. It would, for example, resolve such questions as whether it is better, in terms of emissions, to air freight fruit and vegetables from a country like Spain to a country like the UK, or whether it would be better to grow them in fossil-fuel-heated greenhouses in the UK and avoid emissions from air freighting. In both cases, the cost of permits would feed through naturally to all stages of production and transportation and would thus ultimately be reflected in the prices paid in the shops.

And the border-levelling measures in these proposals provide a good solution to the problem of import emissions between countries outside the EU and countries within the EU.[20]

3.7 Controlling emissions from international aviation and shipping

One of the advantages of a global system of upstream controls on emissions is that it would solve the problem of what to do about international aviation and shipping. The operators of planes and ships would simply buy permit-paid fossil fuels in the normal way. Additional permits would be needed for greenhouse gases such as nitrous oxide, emitted from jet engines.

In principle, the same advantage would apply within the EU if it were to become an 'upstream' region. The worry, of course, is that planes and ships operating within the EU would simply go and get permit-free fuel from nearby places outside the EU.

Problems of that kind can probably be overcome by requiring permits to be purchased for fuel in the tanks of planes or ships when they come in to the EU, and by giving credit for fuel in the tanks of planes and ships that leave the EU. There would, no doubt, be a need for some kind of verification of the movements of planes and ships.

Of course, these kinds of border-levelling measures could be dropped with the creation of a global system of upstream controls.

4 Rolling out the upstream model

If the EU were to adopt an upstream system for the control of industrial greenhouse gases it would smooth the path for the creation of a worldwide system, with many advantages as outlined in Appendix A.

The reform would facilitate the roll-out of a worldwide system in two main ways:

- It would raise awareness of the upstream approach and demonstrate its benefits.
- It would provide an incentive for other countries and regions to adopt the upstream model.

With regard to the second point, any country or region that adopted a compatible version of the upstream model would be exempted from the need to buy permits to sell into the EU. This in itself would be an incentive to adopt upstream controls. And there would be a snowball effect because the incentive would become progressively stronger with increasing numbers of 'upstream' countries. With gathering momentum, the snowball could lead quite quickly to a worldwide system of upstream controls on emissions of industrial greenhouse gases.

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illusion – study" (The Guardian, 2007-12-10, http://www.guardian.co.uk/environment/2007/dec/10/carbonemissions.climatechange).

[20] Notice that the banding of border-levelling rates that we propose to reflect the amounts of fossil carbon that are embodied in different types of product is very much simpler than the idea, mentioned earlier, of trying to track fossil carbon through all stages in the production and transport of manufactured products.

In view of the many benefits of the upstream model, it would be good to set the snowball rolling with upstream reform of the EU ETS.

4.1 A changed role for national targets and national action plans

A key point about upstream controls is that they eliminate the need for legally-binding national targets for reductions in emissions. This has many advantages, described in Section 6 of [K2S 2010]. In particular:

- We can avoid the complexity of negotiating national targets for cuts in emissions.
- We don't have to worry about imposing penalties on whole countries if they fail to meet their targets. In general, it is *very* much easier to ensure that the operators of coal mines, oil wells and gas wells play by the rules.
- Attention can be shifted away from the perceived burdens of cutting emissions and towards the opportunities and benefits of developing the new green economies of the future.

But there is no need to waste the work which has been done in Europe and elsewhere in agreeing national targets for reductions in emissions and national plans about how to achieve those targets. Those targets and plans will help to ensure that countries can decarbonise their economies in line with what is required to minimise the risk of dangerous climate change. But compliance would be a matter for the operators of coal mines, oil wells and gas wells, not nation states.

4.2 Raising funds for mitigation and adaptation

It is now widely accepted that richer countries, including countries in the EU, should help poorer countries make the transition to new clean technologies and should pay for measures to help adaptation to changes in the climate that are already in the pipeline.

A potential advantage of the reforms outlined in Section 2 is that the necessary money may be raised via the sale of permits, as described in [Tickell 2008].[21] It is likely that this would raise more money and meet less resistance than any attempt to raise the money directly from national treasuries or national taxpayers.

4.3 Other benefits

The other potential benefits of the proposed reforms are much as summarised in Appendix A:

- It is in general *very* much simpler to control fossil carbon at or near its source than further downstream.
- As described in [K2S 2010], there are several other potential simplifications compared with downstream systems—with potential benefits for the effectiveness and efficiency of negotiations, in the fairness of arrangements, in the costs of administration, and in reduced opportunities for fraud.

5 Conclusion

It is widely accepted that, while the EU deserves credit for introducing the EU ETS, there have been problems in the workings of that system, and any cuts in emissions that it may have produced are much too small. One of the attractions of the reforms that are proposed in this document is that they would solve those problems and enable the scheme to meet its original goals in a robust and effective manner. *It is unlikely that the EU ETS can be made to work effectively without upstream reform.*

[21] In [Tickell 2008] it is estimated that, in a global system of upstream controls, the auctioning of permits would raise about US$ 1 trillion every year. Of course, within an area like the EU, the amount of money raised would be smaller.

A much bigger potential payoff is that the reforms may lead to a global system of upstream controls, with the many advantages described in [K2S 2010]. By demonstrating how upstream controls can work, and by providing an incentive for other countries and regions to adopt upstream controls, a reformed EU ETS could quickly snowball into a global system.

Similar remarks apply to any non-EU country or region that may be considering introducing a cap-and-trade system for industrial greenhouse gases.

Let’s start the snowball rolling!

Bibliography

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Appendix A. A summary of the advantages of upstream controls on industrial greenhouse gases[22]

The main emphasis here is on 'fossil' CO_2 but the same principles apply to other industrial greenhouse gases.

- Compared with the billions of emissions-producing people in the world or millions of emissions-producing businesses, there is only a tiny number of places that coal, oil or gas are extracted from the ground. This can mean a dramatic simplification of the system for controlling emissions.
- It is *very* much easier to ensure compliance by the operators of coal mines, oil wells or gas wells than to put whole countries in the dock if they fail to meet their targets.
- There is no need for complex negotiations about national targets for each country.
- It is much easier to ensure that caps on emissions conform to science and not political expediency.
- With upstream controls, there is no place for 'carbon offsets', a 'Clean Development Mechanism' or the like, so all the associated problems are avoided.
- Problems associated with fossil carbon that is 'embedded' in traded products would be avoided.
- Industries in rich countries do not face 'unfair' competition from industries in poorer countries because of differences in national targets for reductions in emissions.
- There is no risk of 'leakage' of industries between countries.
- There is no need for special arrangements for international aviation or shipping.
- There is no need for 'dual-level carbon trading' or 'sectoral trading and sectoral crediting'.
- There is no need for special provision to deal with loose targets from the past or with the problem of 'hot air'.
- These kinds of simplifications can reduce or eliminate problems arising from complexity itself:
    - Causing negotiations to become bogged down in a multiplicity of options;
    - Providing opportunities for narrow interests to skew things in their favour;
    - Multiplying the costs of administration;
    - Multiplying the opportunities for fraud.
- Upstream controls can help shift the focus of negotiations from the 'burdens' of cutting emissions to the benefits and opportunities of new green economies.

[22] With some minor revisions, these are the points made in Section 3 of [K2S 2010]. Supporting evidence and arguments are provided in Sections 4, 6 and 10 of that document.