

Putting Emission Limitation on a Solid Foundation: Why Effective International Cooperation Needs to Start with Trade Issues

By Ralph D. Samuelson*

Introduction – The Current Dilemma

Imagine a world where governments considered themselves unable to require imported automobiles to meet any air pollution control standards. In this world, air pollution from automobiles could be dealt with only by imposing standards on domestic carmakers. What outcome might we expect? There are at least two. First, we could expect the domestic carmakers, and everyone whose livelihood depends on them, to intensely oppose any air pollution control standards for domestic automobiles. They would argue, quite sensibly, that such standards would put them at a competitive disadvantage relative to their foreign competitors. As a result, we could expect pollution control standards for domestic automobiles to be weak. Second, we could expect many consumers to buy imported automobiles. This may be because, as in today's world, they prefer them for various reasons. But in this imaginary world they would also buy them because by doing so they can avoid the cost of any pollution control systems required on the domestic automobiles. So only a portion of the automobile fleet would be subject to air pollution control standards of any kind. For both reasons, we could expect little progress in controlling air pollution from automobiles in this imaginary world.

This system sounds quite absurd, yet it is strikingly similar to the system that international agreements have been seeking to use to control greenhouse gas emissions globally. Under the Kyoto Protocol, 37 wealthier countries and the European Union agreed to limit the greenhouse gas emissions produced in their territories over the five-year period 2008–2012, while their consumers remained free to buy products produced anywhere. The results were predictable. First, there was intense opposition to the proposed emission limits, and the emission pricing needed to enforce them, from domestic industries that would suffer competitive disadvantages. For this reason, the United States never ratified the Protocol, while other countries (they know who they are) never took their obligations very seriously, and even the regions that did implement emission pricing (such as the EU and Australia) adopted systems which have low emission prices, incomplete coverage, and which face an uncertain future. Meanwhile, consumers in wealthier countries continued to consume growing amounts of imported products, embedding huge amounts of emissions, from developing countries (see Davis and Caldeira, 2010). The results were dismal enough that a post-2012 successor agreement with binding limits has attracted meager participation thus far. Little progress is being made.

An Alternative – Action from the ‘Bottom Up’ Rather than the ‘Top Down’

What is happening can be viewed as a classic market failure. Economic principles tell us that markets work when consumers pay the full cost (including environmental costs) of the products they consume, and that any departure from this principle produces ‘market failures’ that give consumers an incentive to behave in ways that are not in society's best interests.

Yet under the Kyoto Protocol, with its limits on the territorial emissions in each country, the consumer has a perverse incentive to avoid paying the environmental costs they are imposing on society by purchasing products produced in countries with weak or no emission regulation. The outcome is that producers in countries with weak emission regulation stand to be rewarded in the marketplace, while those in countries with effective emission regulation stand to be penalized. Production can shift to countries where emissions remain uncontrolled, weakening the impacts of any emission regulation (‘leakage’), and penalizing the economies of countries that implement effective emission regulation.

This article will argue that a major step toward effective global action on climate change is, in principle, quite simple: within a given country domestic and imported products should compete on a fair basis, especially regarding emission pricing. And we don't have to wait for the ever-elusive comprehensive global climate agreement to make this happen: each country should enforce compliance on imported products at their own borders with an appropriate border carbon adjustment (Helm, 2012, p. 193-194). Once the competitive playing field is levelled between imported

Editor's comment:

*Ralph Samuelson calls attention to an interesting approach to climate change which, in our view, has not received the attention it deserves. We encourage comment and follow up articles on this from our readers. If there is sufficient interest we could devote an issue or major part of an issue of the **Forum** to the subject.*

DLW

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See footnotes at end of text.

products and domestic products, there would be the beginnings of a politically viable global emissions control scheme. Policymakers in each country would gain the scope to take action, either unilaterally or in concert with other like-minded countries.

Of course, enforcing compliance with emission regulations at borders creates two risks that should be taken very seriously.

1. Developing countries fear that border carbon adjustments could be used to shift the burden of emission reduction from the wealthier countries to them (Böhringer, et al, 2012).
2. There is a general concern that border carbon adjustments could be used as a cover for protectionism (Weitzel, et al, 2012).

If these risks are not properly addressed, the outcome could be further setbacks to international cooperation on climate change mitigation and/or trade disputes that could damage the world economy. However, both concerns could be addressed through proper design of the border carbon adjustments, including internationally agreed-upon rules for their implementation.

Given the lack of progress with the current approach to climate negotiations, a new strategy is obviously needed. Rather than the current strategy of focusing on a comprehensive global agreement from the 'top down', a more promising approach is to build from the bottom-up, starting with agreements that make it more attractive for individual countries to take unilateral actions. And since trade issues are likely to pose the greatest barriers to unilateral action, international cooperation on climate change needs to start with trade issues.

Current Barriers to Unilateral Action

Currently any country is free to take a broad range of unilateral actions to reduce its emissions. Most economists would probably identify putting a price on emissions, such as through a carbon tax or emission trading scheme, as the most important such action (Tyson, 2013). Unlike 'command and control' regulation, an emissions price would impact on the full range of decisions by firms and consumers, and thus produce the largest reduction in emissions at the lowest cost. Also, a price on emissions would provide incentives for technology improvements (Aldy and Stavins, 2012). Indeed, given the size of the emission reductions that will be required to deal with climate change--50-85% by 2050 compared to the year 2000 being called for by climate scientists¹--promoting a 'low carbon technology revolution' should probably be the most important goal of international cooperation (Mattoo and Subramanian, p. 50, Helm, p. 213).

Analysis suggests that adopting a unilateral emission price in wealthier countries should not be economically damaging. For example, an Energy Modeling Forum analysis (EMF 29) of model results from 12 different expert groups found that to cut territorial emissions in 2004 by 20% in the Kyoto Annex 1 Regions (including the USA but excluding Russia) would have reduced the GDP of these regions by 0.6% or less in 11 of the 12 models (Böhringer, et al, 2012, Figure 6). And if the revenues from emission pricing were used to reduce the income tax, thereby eliminating pre-existing tax distortions, the impact could be significantly less (perhaps even negative) (Parry and Williams, 2010).

So What is the Problem?

1. In politics perceptions matter. And policymakers tend to see a unilateral emission price as something akin to putting a tariff on their own country's products not faced by their foreign competitors. Basically, they are being put in the perceived position of having to choose between jobs and economic growth or environmental protection. As long as the choice has to be framed in these terms, environmental protection will lose.
2. It is not just a matter of perception. Emission pricing turns the usual politics of government programs on its head: the benefits (climate protection) are diffuse, but the costs are concentrated on a few energy-intensive and trade-exposed industries. And these industries strongly resist.

Given the politics, a 'race to the bottom' for weaker emission regulation would seem to be the natural outcome, and it largely has been. A border carbon adjustment would directly address these concerns. It would level the competitive playing field, thereby making unilateral action on climate change more akin to other environmental regulation that is taken for granted in industrialized countries.

Would a border carbon adjustment actually help to mitigate climate change? The literature on this topic is enormous². The conclusions are best described as mixed. For example, the EMF 29 results from 12 modeling teams suggest that border carbon adjustments would significantly reduce emission leakage under an emission price, but they would have only a small favorable impact on emissions and GDP

(Böhringer, et al, 2012). The EMF 29 results also suggest that border carbon adjustments would significantly reduce the impacts on energy-intensive and trade-exposed industries, which, given the politics of emission pricing, may be the most important result.

Addressing Border Carbon Adjustment Design Challenges

How would such a border carbon adjustment scheme work? Clearly there are many design options, but here is one proposal that might work. We start with the observation that since the consumer is the key decision-maker in any market, and the one ultimately responsible for greenhouse gas emissions, what we should be seeking to control in each country is not emissions from domestic production but emissions embedded in what is domestically consumed, regardless of where it is produced. ‘Emissions embedded’ refer to the emissions that were caused by the production of the product. (see Helm, 2012, p. 189-190).

As shown in Figure 1, for products that are both domestically produced and domestically consumed, emission pricing could work exactly as it works without border carbon adjustments: producers of fuels or other specified emission-intensive primary products would be required to pay a carbon tax or, under an emission trading scheme, procure emission credits. The cost of the carbon tax or emission credits would then be passed through automatically in the market to consumers of final products made from these inputs.

Under the framework proposed here importers would also be expected to comply with the same emission pricing requirements as the domestic products. So if the importing country has a carbon tax or emissions trading scheme, importers would be required to pay the carbon tax or procure emission credits for the emissions embedded in their imported products. And, in order to protect the competitiveness of domestic products in export markets, exporters would receive a rebate designed to match the emission pricing incorporated in the cost of their product. This framework for border carbon adjustments would be similar to today’s value-added taxes, which are also charged on imports and refunded on exports (Lockwood and Whalley, 2008).

Note that if different countries have different emission pricing schemes, this design automatically provides coordination between them. Every exported product gets a rebate of the emission price paid in the country where it is produced and pays the emission price in the country where it is consumed. In the end, every product is charged the emission price applicable in the country where it is consumed. No agreements between countries are required for this coordination.

Measuring the Emission Content

But how do we measure the emissions content of these imported and exported products? To get it exactly right is a hard, perhaps impossible, problem. However, to quote Helm (2012, p. 191), “it is better to be a bit right than exactly wrong”. Without border carbon adjustments, we are essentially assuming that imported products have zero emission content. Anything we do is better than that.

Ideally, we would charge an emission price on each imported product based on its specific embedded emission content, taking into account the actual fuels and other inputs used to produce it. This would have the benefit of giving exporting countries an incentive to reduce the emissions embedded in their products regardless of whether they have emission pricing. Unfortunately, attempting to base border carbon adjustments on specific embedded emission content raises two very serious challenges.

1. Data. The importing country would have difficulty collecting data or conducting audits in the exporting country, even if the data is available, which it may not be. At best, the administrative burden for both exporters and importing country governments would be large (see Perrson, 2010).
2. Impact on developing countries. Border carbon adjustments based on the specific embedded emis-

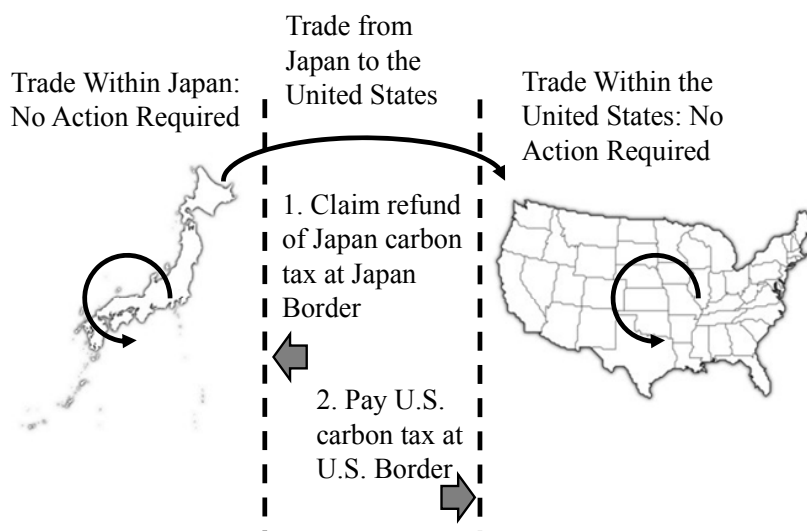


Figure 1. Example of Application of Border Carbon Adjustment Assuming both Japan and the United States have a Carbon Tax.

sion content of the imports would be what Mattoo and Subramanian (2013, p. 24) refer to as the “nuclear option” in terms of its trade consequences for developing countries. The reason is that many developing countries have much more emission intensive production processes than the wealthier countries. For example, Mattoo and Subramanian estimate that a border carbon adjustment based on actual emission content imposed by the wealthier countries could reduce the exports of China and India by 20 per cent. This assumes the wealthier countries adopt an emission price which allows them to cut their emissions by 17 per cent by 2020 compared to 2005 levels.

An alternative approach that would address both challenges would be to charge an emission price on imported products based on the estimated embedded emissions of similar domestic products. This approach should change the competitive landscape very little compared to a world without emission pricing; Mattoo and Subramanian (Table 5-4) estimate the result would be about a two per cent reduction in China and India’s exports. Tables of the emission content for various classes of products could be applied by customs authorities based on model results, thereby minimizing the administrative burden for business.

The framework outlined here should address both risks of border carbon adjustments discussed above. First, since it would change the competitive landscape very little, it does not shift the burden of emission reduction from the wealthier countries to the developing countries. Second, it is clearly not protectionist; indeed, as Helm (2013, p. 191) points out, not to have emission pricing is a trade distortion, since it represents the subsidizing of polluting exports.

The Happy Ending: Facilitating International Cooperation

Policymakers in the wealthier countries should find this framework to be a step in the right direction, since it would allow them to use the most powerful of tool for reducing emissions—emission pricing—without being perceived as undermining their own economy. And policymakers in the developing countries, who are probably more exposed to damage from climate change than the wealthier countries (see Mattoo and Subramanian, pp. 15-16), should like it, too, for at least three reasons.

1. At little cost to developing countries, it would give the wealthier countries the tool to do what the developing countries have been demanding of them: effective action to reduce emissions.
2. By focusing on consumption rather than production, it would (quite properly) shift more of the responsibility for emissions to the wealthier countries.
3. The developing countries will ultimately also need emission pricing if the world is to meet the challenges of climate change and developing country policymakers, too, will want to avoid being perceived as undermining their own economies.

But aside from facilitating unilateral actions, border carbon adjustments can also lay the groundwork for wider international cooperation on climate change. Once there are effective emission measurement and control regimes in place in many countries, pledges to reduce emissions can become credible, their implementation can become transparent to all, and there is little risk to the pledger in making them legally enforceable. Now all kinds of deals become feasible; these include the Kyoto-style “I’ll reduce my emissions if you reduce yours”, international emissions trading, or emission reductions in return for some type of assistance. Effective global action would finally be possible.

Footnotes

¹ See the Intergovernmental Panel on Climate Change (2007), especially Table SPM.6.

² A good place to start is the special supplement to *Energy Economics*, Volume 34, December 2012, devoted to “The Role of Border Carbon Adjustment in Unilateral Climate Policy: Results from EMF 29”.

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13th IAEE European Conference Report

The 13th IAEE European Conference this August in Dusseldorf was organized by the German GEE under the headline *Energy Economics of Phasing out Carbon and Uranium*. More than 300 delegates discussed the status of energy transformation in Europe which is characterized, among others, by unexpectedly low CO₂ prices in the European emission trading system (EU-ETS) and rather high natural gas prices (as compared with the U.S.). Another observation is a significant disintegration of the single European electricity market due to national uncoordinated renewable energy support schemes and proposed national capacity mechanisms. Another topic worthy of mentioning is the merit order effect of the increasing wind power and photovoltaic capacities on the European power markets due to which gas and even some coal fired power stations are today out of the money.

There is little hope that there will soon be political initiatives dealing with these challenges because in May, 2014 the EU parliament will be reelected and a new EU commission will be established. Therefore, the IAEE conference was in something of a reflection period. Actually energy economists have a bit of peace and quiet to develop new and appropriate answers that may guide future European energy policy. At the IAEE conference, business leaders invited energy economists to engage themselves in this direction as scientists have more credibility than industry lobbyists.

In fact a lot of concepts were discussed showing the engagement of IAEE delegates in addressing the relevant issues. However, at the conference it also became clear that scientific models provide unambiguous answers only under precise assumptions. Thus they may even risk delivering misleading conclusions if the complexity of the issues are disregarded. An example was the rather controversial discussion on whether or not power capacity markets should complement the energy only electricity market and – if yes – what design would be effective and efficient.

But there was at least some agreement on the appropriate priority of the next steps. Most important is getting the prices of the EU-ETS right so that carbon friendly technologies that are close to price competitiveness have a chance to access the markets without further support schemes or subsidies.

So the overall impression is that energy economists face a lot of unanswered questions that deserve more scientific research. Regarding the many good papers based on sound theory and methodology and the fine engagement of the delegates during the discussions one can expect that significant progress will characterize coming European and International IAEE conferences.

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