

Climate Change and Competitiveness

A Survey of the Issues

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*Background paper for
workshop on Climate
Change, Trade and
Competitiveness*

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1. Introduction

From the outset, the Kyoto Protocol and the UNFCCC have had to contend with perceived tension between effective action to slow climate change, and maintenance of competitiveness. Competitiveness concerns were the explicit prime motivation for the withdrawal of the US from the Kyoto Process. Competitiveness concerns have since plagued Canada, the US's largest trading partner and the bearer of relatively difficult emissions targets. They have also figured large in the climate-related policy debates in the EU, where they effectively scuttled the EC's 1992 proposed Directive on Carbon Tax, and have continued to dog the elaboration and implementation of the EU's Emissions Trading System (ETS).

This paper explores the nature of the concerns over competitiveness, trying to dissect them in a meaningful way and assess the need for concern. It aims to serve as background to the discussions to take place at the experts' workshop on Climate Change, Competitiveness and Trade, London, UK, March 30, 2005, organized by Chatham House and the International Institute for Sustainable Development.

As a first order task, we should define what we mean by competitiveness. Too often the term is applied to nation states as if they were in some sort of grand contest one against the other. Krugman and others, however, have argued forcefully that competitiveness at the level of the nation state has little meaning, as distinct from simple productivity.¹ That is, while competitiveness is a legitimate concern for firms and sectors, it is not a legitimate concern for countries which, as intuitive as the analogy might be, do *not* compete in a zero sum game in the international arena.

A more useful and legitimate use of the concept is to consider competitiveness at the firm or sectoral level. Here it can be simply defined as sustainable profitability - a state that is maintained in a dynamic contest among firms. The question to be explored in this paper is, then: how will the implementation of the Kyoto Protocol affect the competitiveness of the Parties' firms or sectors?

Given that framework for analysis, this paper does not consider a number of costs and benefits that manifest at the national level, rather than at the sectoral or firm level. For example, it has been argued that competitiveness concerns are overstated since they do not consider the side benefits that may accrue from

¹ Krugman, Paul, "Competitiveness: A Dangerous Obsession," *Foreign Affairs*, March-April 1994, pp. 28-44.

measures designed to constrain carbon emissions, such as associated air quality effects. These sorts of benefits are significant, and need to be considered by national policy makers. But they are not a part of the competitiveness debates *per se*.

With respect to competitiveness, two basic concerns are usually expressed, and both will be explored below. The first (the “non-Party problem”) is that implementation will create an uneven playing field, with firms and sectors from non-Annex B Parties enjoying an unfair advantage because they are not subject to carbon constraints. This argument is expressed most pointedly with respect to the US and large developing countries, and the potential loss of competitiveness this might entail in implementing country firms and sectors.

The second (the “implementation problem”) is that Annex B Parties may create unfair competitive advantages for domestic industry by the manner in which they implement their Kyoto commitments. This argument has recently been considered in the context of the EU, where a highly integrated market spans countries that have the flexibility to elaborate very different national plans for allocating their emissions reductions.

A recent Carbon Trust analysis outlines three variables that together serve as a useful screen for assessing the competitiveness impacts in any given sector:²

Energy intensity: The more energy a sector uses in its production process, the more it will be vulnerable to price increases. Under any implementation scenario, energy prices will increase. In a sector such as aluminum, where on average energy comprises more than 30% of the cost of production, the potential exposure is obvious.

The ability to pass cost increases along to consumers as increased price of the sector’s final product: This ability depends fundamentally on the availability of substitutes, either in the form of other goods that satisfy the same needs, or in the form of production from foreign firms in the same sector. So transport costs are important, as is the global nature of the product’s market. At the firm level, as opposed to the sectoral level, the degree of domestic competition is also important; other things being equal, the more monopoly power, the better able a firm is to pass along cost increases in the form of increased prices. The nature of the good in question also matters; is it a luxury good that consumers will buy more of when prices decrease, or is it a staple that will be bought in relatively steady volumes regardless of price?

² The Carbon Trust, “The European Emissions Trading Scheme: Implications for Industrial Competitiveness,” 2004.

Opportunities for abatement: Firms or sectors in which there are ample unexploited low-cost opportunities for abatement obviously have an advantage over those where there is no low-hanging fruit (either because it has already been harvested, or because the state of technology is not well advanced).

2. Competitiveness I: The Non-Party Problem

The first type of competitiveness concern discussed above is highly intuitive. Since Annex B Parties are subject to Kyoto commitments, and their industrial and energy sectors have to make expensive adjustments, it seems likely that they will suffer a competitive disadvantage relative to the sectors of the non-Parties.

There has been considerable concern of this type in Canada, and this section uses Canada as a case study. It is an apt choice because, for one thing, some 85% of Canada's trade is with the United States, which has indicated it will not ratify the Kyoto Protocol. This dynamic is amplified by the fact that Canada has a relatively difficult target.³ Canadian Manufacturers and Exporters, an industry association, typifies this concern in its arguments:

“Kyoto compliance would result in higher operating and capital costs for Canadian manufacturers in relation to those incurred by their competitors operating in the United States, or in other countries like Mexico, Brazil, Indonesia, South Korea, China, and India ... If costs are passed on to customers, Canadian industry risks losing market share in the United States (the destination for approximately 63% of Canada's total manufacturing output), within Canada, as well as in other countries.”⁴

The paper goes on to cite a number of sectors in which there would be such problems, including electricity, petroleum refining, steel, chemicals, automotive production and other manufacturing.

Most of the studies on which these forecasts are based, however, pre-date the US pull-out from the Kyoto accord (and most of them assume as one scenario no international trading of permits – an assumption that is no longer valid, and that yields high costs). As such, there are two important effects they fail to capture.

³ Cooper, Adrian, Scott Livermore, Vanessa Rossi, Alan Wilson and John Walker, “A Cross Country Quantitative Investigation using the Oxford Global Macroeconomic and Energy Model,” *Energy Journal* 21(3): 335 – 366, 1999; Bernstein, Stephen and Christopher Gore, “Policy Implications of the Kyoto Protocol for Canada,” *ISUMA*, Vol. 2, No. 4, 2001.

⁴ Canadian Manufacturers and Exporters, “Pain Without Gain: Canada and the Kyoto Protocol,” 2003:15.

First, because they assume US participation in Kyoto they fail to actually consider the non-Party competitiveness issues, at least with respect to Canada's biggest trading partner. Second, they fail to account for the impacts of the US pull-out on the trading price of carbon, which according to some studies as much as quartered the expected prices.⁵

More recent modeling from a number of sources, performed after the Bonn Accords, seems to indicate few problems. Certainly at the aggregated national level, Table 1 shows a range of very small predicted GDP impacts. Note, however, that these studies also pre-date the US pull-out.

	Domestic Actions Only	Global Emissions Trading
MS-MRT - Sept 1999	-2.0%	-0.7%
ABARE-GTEM - 1998	-2.3%	-0.3%
ABARE-GTEM - June 1999	-0.9%	-0.3%
POLES - 2000	0.3%	0.2%
SGM - 1998	-1.9%	-0.5%
SGM - Dec. 1999	-1.9%	-0.2%
MRT-C - 1999	-1.3%	-0.3%
Wigle - 2001	-1.1%	-0.5%

Source: Environment Canada. "Costs of Kyoto: What We Know," 2002.

At the sectoral level, a detailed sectoral study by Wigle finds no "important" negative impacts, and even posits potential positive impacts for energy-intensive industries if their energy-intensity is less than that of other Annex B competitors.⁶

There are undoubtedly sectors that would lose market share to US competitors under Kyoto implementation, and there is a need for a more up-to-date sectoral research to explore this question. As noted above, the most detailed sectoral studies to date, while showing minimal impacts, do not assume US non-

⁵ Nordhaus, William, "The Economics of the Kyoto-Bonn Accord," *Science*, Vol. 294, 9 November, August 2001, pp 1283-1284.

⁶ Wigle, Randall. *Sectoral Impacts of Kyoto Compliance*, Industry Canada Working Paper Number 34, March 2001. Note that this study, like the ones used in the CME survey, pre-dates the US pull-out from the Protocol.

ratification. Some research that does assume US non-participation shows more tangible impacts, but assumes domestic actions alone.⁷ The assumption that Canada will not make use of Kyoto's flexibility mechanisms is unrealistic and significantly increases costs.⁸

There have been several recent sectoral studies from the EU, assuming non-US ratification, that show minimal non-Party competitiveness impacts.⁹ But the EU case is less acute, given the generally higher transportation costs between the EU and non-EU countries, and the fact that the market between the EU and others is less integrated than in the North American case.¹⁰

It should be noted, though, that the premise of the Canadian competitiveness concern underlying this research may be fundamentally wrong. That is, the US may in fact be taking action on climate change commensurate with Canadian effort. These efforts are not taking place at the national level, of course, but rather they are taking place at the state level – particularly in the North-East and some West-coast states.¹¹ In fact, some argue that “there is ... a much more substantial body of federal GHG-reducing measures in place in the U.S. than in Canada.”¹²

3. Competitiveness II: The Implementation Problem

It was noted above that a second type of competitiveness concern has been expressed with regard to the implementation of the Kyoto Protocol. That is, countries are at liberty to decide how to achieve their emissions reductions commitments, and it is feared that some might distribute the domestic level obligations in a way that benefits particular sectors. If so, this might create shifts in competitive advantage between Annex B Party sectors.

⁷ See, for example, Bataille, Christopher, et al., “Construction and Analysis of Sectoral, Regional and National Cost Curves of GHG Abatement in Canada: Part IV: Final Analysis Report,” National Climate Change Implementation Process, 2002.

⁸ See, for example, the enormous cost differences between the domestic action case and the trading case expressed in Wigle (2001).

⁹ Reinaud, Julia, “Industrial Competitiveness under the EU Emissions Trading Scheme,” International Energy Agency, 2005; The Carbon Trust, 2004.

¹⁰ Canada and the US are bound by the North American Free Trade Agreement, and a number of related initiatives to reduce non-tariff barriers to trade and investment.

¹¹ Zhang, ZhongXiang, “Open Trade with the US without Compromising Canada’s Ability to Comply with its Kyoto Target,” East-West Center Environmental Change, Vulnerability and Governance Series No. 58, June 2003.

¹² Boustie, Sylvie, Marlo Reynolds and Matthew Bramley. “How Ratifying the Kyoto Protocol Will Benefit Canada’s Competitiveness,” Pembina Institute, June 2002.

This concern has been expressed most clearly in the context of the EU, which is a tightly integrated economic community with relatively low costs of intra-union transportation. As such, in considering this aspect of competitiveness we use the EU as a case study.

A recent study looked at the competitiveness effects of the EU's emissions trading system (ETS) on four vulnerable sectors: steel, pulp and paper, cement and aluminum.¹³ It found little concern for leakage – the loss of industry through relocation outside the region– except for perhaps in the aluminum sector, which deals in a highly global market and faces high energy input costs.¹⁴ This latter result would depend almost entirely on the behaviour of the electricity markets in passing through costs to consumers.

On the question of how differing national implementation would affect competitiveness, though, this study is not helpful since it assumes that all national allocation plans will be implemented identically. A more useful study was done recently by The Carbon Trust.¹⁵ The study looks at implementation in five sectors: electricity, cement, newsprint, steel and aluminum. Unlike the IEA study, this one does pay attention to the implementation of differing national allocations plans, looking in particular at the UK case. It finds evidence that the national-level plans are being differently elaborated, showing that for most countries proposed allowances exceed current needs, even in sectors where carbon emissions are on a downward trend.

The study concludes that there exists potential for shifts in intra-EU competitiveness based on how the NAPs are elaborated. It notes that certain sectors, such as steel, are particularly sensitive to differing elaborations.¹⁶ First order impacts are unlikely to be significant (in some sectors because long-term contracts with energy suppliers will cushion the shocks). But in the longer-term scenario there may be impacts, particularly if the electricity sector is successful in passing through a substantial portion of its cost increases as price increases.

This concern is certainly echoed in industry responses to the NAPs and the ETS, a process that has been fraught with tough negotiation and political pressures. The UK's chemical producers, for example, in commenting on the UK draft allocation plan, which sought to achieve results even beyond those required,

¹³ Reinaud, 2005.

¹⁴ The study did, however, find potential concerns over costs in some cases, but notes that these are likely to be overstated for a number of reasons; the report is pitched at giving an outside boundary picture of costs.

¹⁵ The Carbon Trust, 2004.

¹⁶ Like the IEA study, it singles out aluminum as vulnerable to non-Party competitiveness impacts, and predicts eventual leakage.

warned that “industry’s competitiveness compared with other EU member states could be compromised if they do not adopt such a stringent approach.”¹⁷ They further argued that the sector “faces the prospect of a double blow, in terms of both emissions caps and energy prices, compared with its competitors elsewhere in Europe.”¹⁸ Similar concerns have been expressed by a number of different sector representatives in Member States.

But with the exception of the Carbon Trust study, not much exists in the way of analysis of the potential magnitude of this problem. One way to address it is obviously a coordinated effort in the elaboration of the NAPs. Such a solution is, however, difficult to conceive even in the case of the EU, and is certainly not an option in the context of other Annex B Parties.

In the end, the final constraint of established national targets will reduce the potential for strategic allocations of emissions rights in the national implementation of Kyoto responsibilities; any gain given to a particular sector will necessarily mean pain for others. And the potential for addressing implementation issues as they arise is likely to be greater in settings such as the EU where there is strong existing economic and policy integration -- precisely in those contexts where the implementation competitiveness concerns are greatest. These considerations do not argue for complacency, however, and further research and ongoing monitoring will be needed to guard against damaging competitiveness impacts of this type.

4. Final Considerations

The types of competitiveness concerns surveyed above are real, with potential to cause economic damage. As such, even aside from the economic implications for particular sectors, they are potential obstacles to the political acceptability of Kyoto implementation, and deserve significant attention from policy makers.

That said, there seems to be reason to believe that the final impacts will not be large in most sectors. Where the impacts are projected to be important, as in the case of aluminum in the EU context, flexibility in the allocation of obligations at the national level may be able to help to ease the pain.

¹⁷ Chemical Industries Association (UK), “CIA Seeks Greater Clarity on Draft UK Emissions Plan,” Jan. 19 2004.

¹⁸ Chemical Industries Association (UK), “CIA Highlights Differences in EU National Allocation Plans,” March 25, 2004.

Another hopeful consideration is that most studies looking at the costs of implementation do not take account of the potential for endogenous improvements as a result of regulation itself. Porter and others have found evidence that strong environmental regulation leads to improvements in technology and know-how that may in and of themselves drive improved ability to meet Kyoto obligations at low cost.¹⁹

It would be a rare survey of research that did not conclude with the observation that more research is needed. This paper is not rare in that sense. The great bulk of quantitative analysis that now exists was undertaken before many of the rules and decisions that now prevail in the Kyoto regime. If we are to properly assess the implications of current policy alternatives, we will need a more solid base of analysis on which to do so.

¹⁹ Porter, Michael and von der Linde, "Green and competitive", *Harvard Business Review*, September/October 1995, pp. 120-134. See also the recent report by Sijm et al., "An Assessment of the Incidence of Carbon Leakage and Induced Technological Change Due to CO2 Abatement Measures," Netherlands Research Program on Climate Change, Report 500036 002, 2005.