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In the period leading up to the ratification of the Kyoto Protocol on December 16, 2002, Canadians were swamped with paper on the Kyoto Protocol from the Federal Government, and the Alberta Government, as well as from private groups like the Alliance of Canadian Manufacturers and Exporters (2002), and the Pembina Institute (Boustie et al., 2002). If that were not enough, there was the public affairs advertising from supporters and opponents of Kyoto on television every night. This all provoked my interest in trying to understand the implications of Kyoto for the Canadian economy.

When I started my research, I would have classified myself as a supporter of Kyoto, although not a very informed one. But the more I read, the more my doubts grew about whether it was really wise for Canada to ratify the Protocol at this time and in exactly the form that was being proposed by the Government.

At the outset, let me make it clear that I am not a climate change sceptic (i.e. McKitrick and Wiggle, 2002). I agree that there is plenty of evidence that climate change is a problem and that anthropogenic Greenhouse Gas (GHG) emissions are a contributing factor. I also agree that Kyoto is only the first step on a long journey to deal with what is admittedly a serious global problem. Moreover, it is the only game in town and it is important that Canada participate in it, even if only through its membership in the UN Framework Convention on Climate Change behind the Kyoto Protocol. But regrettably it is also important to recognize that without the United States and developing countries in the Protocol, there is no guarantee that meeting all the targets will have an appreciable impact on global warming.

My difficulties with Kyoto begin when I start to think about what exactly the Canadian Government has committed itself to by signing on. Let me list a few of the most important problems.

The 240 Megatonne Target is Very Ambitious

The 240 megatonne reduction target for the first commitment period (2008-2012), which is 6 per cent below 1990 levels, is extremely ambitious for an energy-producing country like Canada. In fact, it would put Canada in the anomalous position of being the only major energy-producing country in the world that is required to reduce its GHG emissions below 1990 levels. The United States is not going to accede to the Protocol. The energy-producing members of the European Union (EU) will be able to take advantage of a scheme under the Protocol called a "bubble" which will enable them to redistribute their 8-per-cent reduction target among themselves. Norway, an energy-producing country that is not a member of the EU, has a target that allows for a 1-per-cent increase over 1990 levels. Australia, which has already announced its intention not to accede, would have had a target of an 8-per-cent increase.

The target reduction for Canada is particularly problematic given the objective of increasing exports of oil from exploitation of oil sands, which is a very GHG-intensive emission process.

The Government is counting on actions already taken in *Action Plan 2000* (Canada, 2003c) and *Budget 2001* (Canada, 2000) to produce 80 megatonnes of the reductions. But here we are already in 2003 and the gap between the target and actual emission levels is still growing in spite of these measures. The Assessment prepared by the Analysis and Modeling Group for the Federal Provincial Committees of Energy and Environmental Minister estimated a required reduction of only 199 megatonnes in November 2000. Two years later in spite of measures taken the gap has grown to 240 megatonnes. The gap had also increased by 40 megatonnes between 1997 and 2000. All this makes you wonder if the Canadian Government really has a very good handle on the factors driving the growth of GHG emissions in Canada. The results of the government's proposed assessment of the effectiveness of the measures, which it promises to initiate in the coming months, will hopefully shed some light on this issue. But in the meantime, we certainly cannot have much confidence are we that we can meet the targets using the instruments that we have at our disposal?

In *Climate Change Plan for Canada* (Canada, 2002b) which was released November 21, 2002, the Government is still hoping to get up to 70 megatonnes of credit for cleaner energy exports to help meet the remaining 60 megatonne gap. Other countries have been resistant to this request. This is not surprising considering that Canada is already exporting the clean energy to the United States, a country that has not signed on to Kyoto. It is hard to see how such exports are contributing to an overall reduction in GHG emissions by signatories of the Kyoto Protocol or even to global emissions reductions unless the exports are in excess of the base level.

The Estimated Impact on the Economy is Huge

A wide range of estimates from 0 to 3 per cent of GDP have been presented for the cost of meeting the reduction target by the Analysis and Modeling Group in its "Assessment of the Economic and Environmental Impacts of the Kyoto Protocol" (Canada, 2000) and this for a 199 megatonne reduction target. This would be a cost of as high as $40 billion per year.

Even the analysis of the Reference Policy Package (RPP) presented in the government's most recent paper, *Climate Change Plan for Canada* (Canada, 2002b), estimates that the accord could have as large of an impact as 1.1 per cent of GDP and 190,000 jobs. While smaller than some of the earlier estimates, this is still pretty large, considering that the RPP only includes 170-180 megatonnes of GHG emission reductions and makes no assumption about how the balance of 60-70 megatonnes of reductions is to be achieved.

Note that I have cited the results of the case for low $10 carbon price and tax financing rather than government financing. This is because the government financing case does not provide a fair estimate of the impact of Kyoto. It is not appropriate to count the expansionary impact on the economy of the deficit-financed spending associated with Kyoto. Any deficit-financed government spending would have a similar effect on the economy. If the government does not spend the money on complying with Kyoto, it will use it to pay for other spending initiatives or to cut taxes, which will have an equal or greater expansionary effect on the economy than the Kyoto spending.

Another observation about the government's macroeconomic analysis of Kyoto is that its summary Chart 2 presenting the impact of Kyoto has wrong numbers for the impact on GDP for the tax financed case.

Even though there are not any other Canadian studies, the Australian modelling group ABARE (Jakeman et al., 2001) estimated that the impact in Canada could be more than double that in Australia, more than four times that in the EU, and 10 times that in Japan. This provides an indication of the challenge Canada faces relative to other countries.

The up-to-3-per-cent estimated impact in Canada is not small in relation to the 18 per cent growth expected in the Canadian economy between 2002 and 2010. This is especially true when it is remembered that it will be in income per capita, and thus significantly increase the already large 15-per-cent gap with the United States.

To put this all in perspective, it's useful to recall that most of the empirical studies of the impact of the Canada-US Free Trade Agreement cited by the Department of Finance mostly ranged from 1 to 3 per cent of GDP (Canada, Department of Finance, 1988). In other words, the Kyoto Protocol is estimated to have as large a negative impact on the Canadian economy as the estimated positive impact of Free Trade.

Recognizing this striking fact, the government's use of only one model - TIM - to carry out its analysis contrasts sharply with the macroeconomic analysis carried out at the time of the free trade agreement when large numbers of estimates of the macroeconomic impact were prepared by many different modeling groups. If the impact is the same order of magnitude, wouldn't it make sense to subject Kyoto to the same analytical scrutiny as free trade? Aren't the Department of Finance and the Bank of Canada supposed to be the experts on the macroeconomic impacts of government policies? Why have they not produced any analysis of Kyoto?

It also goes without saying that the estimates from these models are speculative and do not have a high degree of reliability. But lest we take too much comfort from this we should remember that there is also no guaranty that the models, unreliable as they may be, will necessarily underestimate the impact.

The United States Will not be in Kyoto

Last year's announcement by the Bush Administration that the United States would not be participating in the Kyoto Protocol has wide-ranging implications for Canada that have not been thoroughly explored. To have the Kyoto Protocol apply to only one part of a highly integrated North American economy raises all kinds of problems. That Mexico will not be covered causes much less difficulty given Canada's relatively weaker trade links with Mexico.

Unfortunately, the Government has not yet produced one single study examining the impact of a go-it alone strategy on the competitiveness of Canadian industry. With free trade with the United States, there is a real threat that in the short run Canadian production bearing the costs of reduced GHC emissions would be displaced by US production, either through reduced exports or increased imports. Evidently, this is what the government thinks will happen with gasoline "where refiners, faced with higher costs, [will] choose to supply more of the market through imports," thus preventing gasoline prices from going up." (Canada, 2002b, p.64).

There can be no doubt that Kyoto will undermine the competitiveness of Canadian industry in the short run. The only question is how much? In the longer run, of course, the exchange rate would depreciate bringing Canadian costs on average back into line, but GHG-emission-intensive industries would still be left with higher costs.

Recognizing the adverse impact of Kyoto on competitiveness, the Government has already exempted the motor vehicle industry from the emission reduction targets to be imposed on large emitters. The Government has also provided guaranties that the cost of carbon credits to offset emissions will be capped at $15 per tonne of carbon dioxide. While this may limit the adverse effect on competitiveness of reducing emissions for big emitters like oil sand plants, it just passes the potential cost on to Canadian taxpayers if the costs of international emission permits rise to the top end of the Government's $10 to $50 per megatonne range. Increased taxation can also undermine Canada's international competitiveness.

Canadian industry clearly recognizes the threat to its competitiveness position from Kyoto. That is why all the trade association such as the Alliance of Manufacturers and Exporters, the Chamber of Commerce, and the Canadian Association of Petroleum Producers have been protesting so vociferously. They have genuine concerns that need to be addressed and that haven't been yet.

Time is Short

The beginning of the 2008-2012 commitment period is only five years away. It will take some time to reduce GHG emissions. Some of the biggest savings will require the development of new technologies and their implementation. The full support of provincial governments and the business community will be required. Given the amount of grumbling that is still being heard, this has not yet been secured.

The fact that the Canadian Government has not come forward with a specific detailed plan yet (and I certainly do not consider *Climate Change Plan for Canada* (Canada, 2002b) to be such a plan) makes the attainment of the target all the more problematic. The Prime Minister himself was quoted in the *Globe and Mail* on September 25 as saying that we have ten years to develop a plan to 2012 (Chase and Mahoney, 2002). That does not inspire much confidence that the Government is on top of the situation and will be able to meet the targets without imposing burdensome costs on the Canadian economy.

Constitutional Issues

Many of the instruments required to meet the targets are in provincial jurisdiction. Their full cooperation will thus be necessary. If a province such as Alberta were to dig in its heels, the confrontation could be very nasty like during the time of the National Energy Policy and jeopardize the ability of Canada to meet its agreed upon target. It may even be necessary to make a reference to the Supreme Court as was done for the Anti-Inflation Act to clarify the Federal Government's authority. What if the Federal Government were to lose?

There Are Major Uncertainties about Cost

There are three major risks that could make meeting the Kyoto targets more expensive than expected:

- The gap could be larger if economy grows faster or more GHG than expected per unit of GDP are produced;
- Current and proposed measures to reduce GHG might not work as well as expected;
- The international price of carbon permits could be greater than expected (the range is $10 to $50 per tonne range and the expectation is at the low end of the range).

If Canada were unsuccessful at meeting its targets through domestic measures, it would have to buy permits, which could be very costly. Under Option 4, which is presented in the Government's *Discussion Paper on Canada's Contribution to Addressing Climate Change* (Canada, 2002a, p.34), Canada would purchase international permits covering 41 megatonnes of emission or 111 megatonnes of emission if the clean energy exports aren't counted. This could cost anywhere from $410 million per year to $5.55 billion per year. In *Climate Change Plan for Canada* (Canada, 2002b), the Government proposed to buy international permits only covering 12 megatonnes, which would result in a much lower cost.

Needless to say, the Canadian public wouldn't be very happy to have to pay any large sums at all to the Russian Federation or other state with surplus emission reductions to sell, particularly if such surpluses result from post-1990 declines in economic activity and not from genuine reductions in emissions.

The Kyoto Protocol Could Preclude Other Major Initiatives

The costs of the measures required to encourage GHG emission reductions and expenditures on emission permits as well as the reduced revenues from lower levels of economic activity is potentially so large that it could severely erode the Government's future fiscal dividends. The Government would consequently find itself in a position where it could not afford other major spending or tax initiatives, and might even have to cut spending or raise taxes.

An Escape Hatch

The Canadian Government has clearly boxed itself into a corner over Kyoto. It should have never committed itself to a 6-per-cent reduction just to match the United States. Now that the US has pulled out, it has left us out on a limb. It is also probably too late to get credit in this commitment round for the exports of clean energy, even ignoring the illogic of such a claim.

Now that we have signed on to Kyoto and are moving into the implementation phase, there is a high probability that we will have to face many of the problems raised above. There will be more acrimonious federal provincial wrangling, and continued opposition from the business community. The high cost of compliance will likely drain the resources available for other initiatives. Canadian competitiveness will be undermined relative to the United States and the relative decline in our living standards would continue.

If worst comes to worst, however, it need not be a total disaster. Fortunately, there is an escape mechanism that can still save us from incurring pointless and excessive costs. It is to withdraw from the Kyoto Protocol under Article 25, which allows withdrawal with one years notice (United Nations, 1992, p. 30). This would presumably allow us to avoid having to pay the large penalties from failing to meet targets. My advice to the government, consequently, would be that it ought to carry out a full-fledged review of Kyoto by mid 2006. If it still looks by then that we are going to substantially exceed the target and that the cost of international permits is too high, Canada should give the required notice of its intention to withdraw.

While many countries would not view withdrawal as a very constructive way for a responsible member of the international community to behave, many others would recognize it as a necessary step given our high level of economic integration with the United States and the constraints that Canada faces as a NAFTA member. In particular, EU members should appreciate that something as important as GHG emission reduction policy requires a joint approach since their own ratification of Kyoto was a joint decision involving a joint strategy of implementation.

Even if Canada is eventually forced by circumstances to withdraw from Kyoto, that should not be an excuse for Canada to do nothing. It should continue to follow a "Made-In-Canada" Approach to the reduction of emissions of GHG, which would still seek to reach Kyoto targets, although perhaps over a longer period of time. The actual approach would have to be prepared in cooperation with the provinces and the business community. A real solid plan for implementation would still have to be developed.

Canada could also undertake to work with the United States and Mexico to develop a common North American Approach under NAFTA. The objective of this would be to prepare NAFTA to join Kyoto, perhaps for the next commitment period, and perhaps only if a greener (Democratic?) Administration were to be elected in the United States.

Finally, and importantly, Canada could continue to play an active role under the United Nations Framework Convention on Climate Change, complying with all the measurement and reporting requirements. So even if Canada were to withdraw from Kyoto, we could still retain our place at the international table addressing the important issue of climate change - only a small consolation perhaps, but a consolation nevertheless.

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