MEADOWCROFT 10/12/07 2:07 PM Page 115

TIME TO ACTUALLY BEGIN

James Meadowcroft

Mark Jaccard and Nic Rivers' chapter in this volume, "Canadian Policies for Deep Greenhouse Gas Reductions," is divided into three main sections. The first introduces the challenge of climate change policy. The second discusses criteria for selecting policies, the menu of available instruments and parameters for composing a preferred policy package. And the third describes, and then considers the combined impact of, three key policies: a carbon management standard for fossil fuel producers and importers; a zero-emission vehicle standard for vehicle manufacturers; and strengthened residential and commercial building codes and appliance and equipment standards.

After commenting briefly on the opening sections of the paper, I will focus on the three selected policies and then offer some concluding observations.

THE APPROACH TO CLIMATE CHANGE POLICY

Jaccard and Rivers provide an excellent introduction to the challenge of climate change policy in Canada, the criteria for selecting policies and the range of available instruments. The most important practical conclusion to be drawn from their opening discussion is that voluntary programs and subsidies will not prove effective in securing significant long-term greenhouse gas (GHG) emissions reductions. Instead, market-oriented regulations, supplemented by some more traditional command-and-control initiatives, will be required.

The necessarily synthetic presentation of the Jaccard and Rivers chapter causes some nuances to be lost, particularly with respect to the political complexity of the climate change file and the comparative costs and benefits of policy alternatives. To the points made in the chapter, it is worth adding several observations.

First, climate change policy requires both adaptation and mitigation. Neither of these can be avoided, because we are already fated to experience substantial climate change due to GHG releases that have already occurred, and because GHGs will con-

MEADOWCROFT 10/12/07 2:07 PM Page 116

tinue to accumulate in the atmosphere (provoking still further warming) until global emissions are radically curtailed.

The authors' proposal of Canadian emissions reductions of 60 percent from current levels by 2050 provides a convenient basis for discussion, but deeper reductions with an earlier onset may be desired. European Union environment ministers recently agreed to a target reduction of 20 percent from 1990 levels by 2020 — that target would increase to 30 percent if other countries join the effort. Recent studies suggest that to reach stabilization in the range of 450 to 550 parts per million of carbon dioxide (CO_2), emissions from developed countries (as a group) would need to fall 70 to 90 percent below 1990 levels by 2050 to allow for emissions growth in developing countries (Stern 2006).

Canada's response over the past decade to the climate change issue represents a major policy disaster. The story is complex and has yet to be told in full. It includes a serious failure of political leadership and deliberate obstruction by vested interests. In policy terms, we lag perhaps a decade behind more innovative jurisdictions (such as the United Kingdom, Sweden, Germany and the European Union as a whole), and this will have political, diplomatic and economic consequences.

Although large distances and cold winters contribute to Canada's comparatively high energy intensity per unit of GDP and elevated GHG emissions per capita, the long-term historical development of the economy and earlier rounds of policy choice also play a significant role. Low-cost resource inputs have been a cornerstone of Canadian economic development — and note, for example, that gasoline taxes in Canada are less than half the levels in most other Organisation for Economic Co-operation and Development (OECD) countries.

Finally, while Jaccard and Rivers are correct that long-term price signals (which can be generated by environmental taxes or market-oriented regulations) provide an effective stimulus for technological innovation, there is evidence that other forms of government intervention can also encourage the development and diffusion of new technologies (Vollebergh 2007).

THE THREE POLICY OPTIONS

A carbon management standard for fossil fuel producers and importers

The authors' first proposed policy would require fossil fuel producers and importers to demonstrate over time that a growing proportion of the carbon in the fuel

MEADOWCROFT 10/12/07 2:07 PM Page 117

they sell did not reach the atmosphere. Each year, firms would submit to regulators certificates demonstrating that they had met the obligation. Regulated firms could trade certificates with each other and buy project-based certificates from upstream and downstream GHG abatement efforts (such as carbon capture and storage at power plants, and the reduction of emissions at the wellhead, in refineries, in pipelines and so on). The system could be designed to cover other GHGs in the energy sector, as well as producers and importers of nonenergy-related GHGs. It could incorporate a safety valve and/or the banking and borrowing of certificates. A partial exemption for fossil fuel exports would limit impacts on international competitiveness in this sector.

This is an innovative policy proposal with several appealing features. First, it focuses attention on the core of the mitigation issue: GHG releases associated with the production, distribution and use of fossil fuels. Second, it embodies the "polluter pays" principle and some notion of extended product liability. Companies that produce and import fossil fuels will ultimately be held accountable for the emissions generated from the products they bring to market. Third, it covers fossil fuel usage throughout the economy, in contrast to a downstream cap-and-trade system (like the European Union Emission Trading Scheme or the original Canadian large final emitters program), which deals only with large industrial emitters. Finally, it avoids problems associated with the distribution of permits under emissions cap and permit trading systems.

But there are also some difficulties. First, we have limited practical experience with upstream obligation and certificate trading systems; we know more about the actual operation of emissions cap and permit trading systems and tax-based instruments. In addition, most other jurisdictions have adopted (or appear to be gravitating toward) these alternative designs for GHG abatement. Selecting a policy design that is different from those of other industrialized countries involves some risks. It could, for example, make it somewhat more difficult to engage in international emissions trading.

Moreover, it is not clear whether this proposal would easily win political acceptance. Politicians and the public are just beginning to come to terms with the idea of a downstream cap-and-trade system. Might this proposal further complicate debate and delay action? Some will argue that it unfairly shifts the whole burden of responsibility for adjustment onto fossil fuel producers and importers. Paradoxically, removing the problem of permit allocation associated with emissions cap and permit trade systems might be perceived as a negative by some political and economic actors who would have decreased opportunities to "game" with the system.

A number of issues appear to merit further consideration. To begin with, it would be nice to see a more detailed comparison between this policy option and two

MEADOWCROFT 10/12/07 2:07 PM Page 118

others: a downstream cap-and-trade system supplemented by a downstream carbon tax (the latter applicable to the economic sectors, such as households and transport, not covered by the cap); and an upstream carbon tax (that is, one levied at the point of production or import). Such a comparison should not only deal with economic effects, but it should also consider how the rival systems would actually be experienced by different economic actors and perceived by different political actors.

Linkage to international GHG trading systems is important if Canadian companies are to have access to the most advantageous cost abatement options. Modalities for linking the proposed system to other trading systems (and for avoiding double counting) should be explored.

In the longer term, if highly localized options for GHG mitigation emerge, the carbon management standard trading system could be expanded to include emissions reductions secured by consumers of fossil fuels — extending the potential reach of the scheme as delineated in figure 3 of Jaccard and Rivers' chapter.

A zero-emission vehicle standard for vehicle manufacturers

The second policy establishes an obligation and certificate trading system for vehicle manufacturers and importers that requires an increasing percentage of total sales to be made up of zero-emission vehicles. The focus on zero (tailpipe and evaporative) emissions is intended to encourage technological system change rather than incremental improvements to fossil fuel engine efficiency. Although the proposal is centred on passenger vehicles, the policy could be extended to freight transport.

Among the advantages of this proposal are that it would create a protected niche to encourage the development of zero-emission vehicles (which are important for long-term GHG abatement), and that it would leave it to firms and markets to determine the best technologies to meet the mandated goal. Yet this approach raises some concerns.

First, from the perspective of long-term GHG abatement, it is important to minimize total emissions reaching the atmosphere. Other things being equal, policy-makers should be relatively agnostic about which technologies will deliver the required level of aggregate GHG reductions. Hydrogen, electricity, biofuels and hybrid technologies may all play a role in the solution. Zero-emission vehicles will be important, but so will low-GHG-emission vehicles. After all, a low-GHG-emission vehicle running on fossil fuels might be associated with lower-life-cycle GHG emissions than a zero-emission vehicle running on hydrogen or electricity derived from fossil sources. Moreover, it is unclear what the costs of the different technological options will be. For this reason it would seem

MEADOWCROFT 10/12/07 2:07 PM Page 119

prudent to link low-GHG-emission and zero-emission vehicles in the standard, an option the authors themselves raise.

Second, considering the international character of the auto industry, it may not make sense for Canada to pursue a technology-forcing policy in isolation from initiatives in other jurisdictions. The policy would be most effective if implemented in step with initiatives in other countries. Third, questions may be asked about the phasing and range of the obligation. For example, if the policy is promoted on the grounds of niche protection, why does it end by mandating 80 percent compliance in 2050?

Residential and commercial building codes and appliance and equipment standards

The third policy involves regulations designed to raise standards for the construction of residential and commercial buildings and for the energy efficiency of equipment and appliances. Strictly speaking, this is not one policy but a series of related policies involving carefully designed instruments enacted by different levels of government. These policies are intended not to drive technological innovation but rather to encourage the diffusion of existing technologies by prohibiting the least efficient products from entering the market and so gradually raising the average efficiency of the overall stock.

This policy strand is important in overcoming barriers that discourage groups and individuals from making more energy-efficient choices. It is also important because it creates the possibility of making relatively substantial short- to medium-term gains. Measures that reduce (or slow the growth of) aggregate electricity demand help postpone the need for additional generation capacity to a time when prices and technologies presumably will be more favourable to GHG abatement. Short-term reductions in GHG emissions are particularly desirable because they (modestly) contribute to slowing the rate of warming. More crucial are their potential political and diplomatic impacts at a time when Canada is failing to meet agreed international GHG reduction targets.

In developing such regulations, it is important to set them in a context of continuous improvement: there should be a commitment to periodic revision (perhaps every five years) and a strong signal that regulations will become ever more stringent.

ADDITIONAL OBSERVATIONS

The three policy proposals assessed here constitute a useful package of measures to pursue long-term abatement of Canada's GHG emissions. The first

MEADOWCROFT 10/12/07 2:07 PM Page 120

engages with the most important framework issue by driving up the price of carbon emissions. The second addresses the critical transport sector, where emissions are rising rapidly and fossil fuel dependence is most complete. The third involves regulatory initiatives to secure significant energy efficiency gains.

The assumption behind the Jaccard and Rivers proposal is that a long-run price signal is required to orient investment decisions toward GHG abatement and to stimulate the technological innovation required to achieve significant reductions. The real impact of the carbon management standard will be that it will progressively drive up the price of fossil fuels as it becomes necessary to prevent an ever-greater share of associated GHG emissions from entering the atmosphere.

However, as the Stern report has forcefully argued, carbon pricing is not enough. Other policy instruments must be invoked to accelerate technological invention, innovation and deployment, and to encourage behavioural change (Stern 2006). Public policy can help breach the barriers (including information issues, transaction costs, and behavioural and organizational inertia) that prevent smooth adjustments to rising carbon prices. Varied policy tools can be applied across the innovation chain to speed up the emergence and deployment of new technologies (Geels 2002). Although subsidies do have a place here, there is also a major role for government as a catalyst for innovation networks. Some of these issues have begun to be discussed in the emerging literature on transition management (Rotmans, Kemp and van Asselt 2001; Kemp and Rotmans 2003; Kemp and Loorbach 2005).

Although trajectories for GHG abatement are typically discussed in terms of environmental risks and economic costs, it is important to note that political factors should be accorded independent weight. Building successful international collaboration — and this would include inducing the large developing countries to achieve an appropriate level of participation — is essential if dangerous climate change is to be avoided. By securing emissions reductions in the short to medium term, developed countries can establish the seriousness with which they view this issue and thus encourage others to act. Given that Canada has taken no meaningful steps to achieve its agreed-upon (Kyoto) abatement target, an effort to secure some early emissions reductions (either domestically, or through the use of international mechanisms) is important politically — even if these reductions turn out to be somewhat more costly than they would have been had they been undertaken earlier (or would be if they are deferred).

One of the difficulties of approaching climate change by isolating one or two headline policies is that there is no magic bullet to be found. A mature policy framework must include initiatives related not only to mitigation but also to adaptation. An

MEADOWCROFT 10/12/07 2:07 PM Page 121

advantage of bringing forward the discussion of adaptation is that it makes more real the emerging costs of dealing with a changing climate. On the broad scale, initiatives in public education, science policy and industrial policy are also important dimensions of climate policy.

Nevertheless, at present, in order to advance climate change policy in Canada it is critical that government take action to end the free use of the atmosphere as a GHG dump. This could be done through a carbon tax, some form of emissions cap and permit trading system or the carbon management standard described by Jaccard and Rivers. In April 2007, the Conservative government announced a new regulatory framework, including a baseline and credit trading system involving intensity targets and a series of flexibility mechanisms (including contributions to a technology fund and offsets). The government objective is to reduce GHG emissions by 20 percent from 2006 levels by 2020, but the information released so far on the derivation of the intensity targets and the design of the scheme makes it unclear how far the system could actually contribute toward such a goal. After so many delays, some form of binding controls in this area would at least be a beginning. And the regime could be tightened in the future. But, to be effective, the initiative should ultimately be complemented with measures that apply to parts of the economy that fall outside the regulated sector, such as a downstream carbon tax.

Notwithstanding the recent federal announcements, the carbon management scheme presented by Jaccard and Rivers deserves consideration. It should be examined by a wider audience in Canada, including stakeholders in government, business and the environmental sector. And it should be considered among the options for post-Kyoto international efforts. Of course, changing policy designs at some point in the future (say from one market-oriented regulatory mechanism to another) would incur costs. But it is not impossible. Indeed, we should probably expect such shifts as countries learn more about GHG abatement over the coming decades.

MEADOWCROFT 10/12/07 2:07 PM Page 122

REFERENCES

Geels, F. 2002. *Understanding the Dynamics of Technological Transitions: A Co-evolutionary and Socio-technical Analysis*. Enchede, the Netherlands: Twente University Press.

Kemp, R., and D. Loorbach. 2005. "Dutch Policies to Manage the Transition to Sustainable Energy." In "Innovationen und Nachhaltigkeit," *Jahrbuch Ökologische Ökonomik* 4. Marburg, Germany: Metropolis-Verlag.

Kemp, R., and J. Rotmans. 2003. "Managing the Transition to Sustainable Mobility." In *System Innovation and the Transition to Sustainability: Theory, Evidence and Policy*, edited by B. Elzen, F. Geels, and K. Green. Cheltenham, UK: Edward Elgar.

Rotmans, J., R. Kemp, and M. van Asselt. 2001. "More Evolution than Revolution: Transition Management in Public Policy." *Foresight* 3 (1): 15-31.

Stern, N. 2006. *Stern Review: The Economics of Climate Change*. London: HM Treasury, Government of the United Kingdom. Accessed June 15, 2007. www.hm-treasury.gov.uk/media/8AC/F7/Executive_Summary.pdf

Vollebergh, H. 2007. *Impacts of Environmental Policy Instruments on Technological Change*. Paris: Organisation for Economic Co-operation and Development (OECD).