
Conclusions and Policy Recommendations

As this book has detailed, addressing the challenges of climate change has become more difficult and costly for the United States, Canada, and Mexico. Climate policy faces uncertain prospects in all three countries. In each, federal regulations and actions by subnational governments seek to supplement, and often substitute for, national climate policies. The US Environmental Protection Agency (EPA) is pursuing new environmental regulations in the face of an impasse over national climate legislation in Congress. A few US states and Canadian provinces are implementing economy-wide cap-and-trade legislation, and most have renewable energy and energy-efficiency policies in place. The Mexican government has formulated plans to reduce its emissions but will need more funding and capacity assistance from developed countries to fulfill its ambitious goals.

In the preceding chapters, we have explored three major challenges in crafting climate policy. The first is to manage regional economic impacts within countries. In Canada, there is a geographic split between the western provinces, which depend on the oil and gas industry for economic growth, and other provinces that have a diversified industrial base and derive a greater share of power from renewable sources. In the United States, climate action consists of a patchwork of measures pursued by a number of eastern and western states. To generalize broadly, divisions exist between coastal states, some of which are beginning to develop clean technology industries, and inland states that have high endowments of coal, oil, and greenhouse gas (GHG)-intensive manufacturing. In contrast to Canada, where “climate hawkish” and “climate dovish” provinces exist in roughly equal number, US states pursuing serious climate action are the exception rather than the rule.

While most states have some form of renewable portfolio or energy-efficiency standard for utilities, only a handful are considering an economy-wide

approach. As we showed in chapters 2 and 3, the states and provinces that have successfully mobilized political momentum toward stringent climate change policies are mostly those that had relatively little carbon-intensive production to begin with. Getting states and provinces that depend on coal, oil, and energy-intensive sectors for economic growth to join a GHG regulatory regime is a more difficult task.

Unlike most emerging economies that are not obligated to set GHG mitigation goals under UN convention,¹ Mexico has a national plan in place that aims to cut emissions in half by 2050. Distributional concerns also complicate Mexican policy but in a somewhat different way than its northern neighbors. Mexican policy has largely been top-down, and the focus is on technology deployment, forestry, and capacity building rather than carbon pricing or other market mechanisms. As in the United States and Canada, determining who pays for these policies is a challenge. Given the fiscal issues discussed in chapter 4, Mexico hopes to tap foreign sources of finance to develop new green energy technologies and to implement GHG mitigation strategies.

The second related challenge is to address competitiveness concerns. In the United States, lawmakers are focused less on how climate policy's compliance costs will adversely affect regional trade and investment, and more on what kind of threat will be posed by emerging markets that are not obligated to pursue similar policies. China and India are at the forefront of their concerns.

In contrast, competitiveness concerns in Canada focus on the United States. Canada exports the vast majority of its energy-intensive products to the United States. Thus the absence of federal climate change legislation in the United States introduces the risk that any serious Canadian policy to regulate GHG emissions could cause Canadian energy-intensive production to simply migrate across the border. This "carbon leakage" could exacerbate the economic dislocation generated by a stringent Canadian climate change regime. The Harper government has seized upon these potential competitiveness impacts as a reason to tie Canadian efforts to US federal policy on climate change.

Canadian officials are just as afraid of certain types of climate change policies as they are of US inaction. In particular, they have responded sharply to US policies that target carbon-intensive transportation fuels. The province of Alberta is heavily dependent on exports of carbon-intensive oil sands fuels to the United States, and Saskatchewan exports a large amount of conventional crude. US implementation of a low-carbon fuel standard, while benefiting the overall international goal of reducing GHG emissions, could prove disruptive to production and investment in Canadian oil, particularly unconventional oil sands projects.

The third challenge is to align energy and transport infrastructure to improve energy efficiency and expand opportunities for renewables and low-

1. The Copenhagen Accord obligated non-Annex I countries (minus least developed countries) to undertake "nationally appropriate mitigation actions." China and India have submitted intensity targets that produce questionable emissions reductions relative to business as usual, and few developing countries have committed to absolute emissions reduction targets. See Cline (2010).

carbon fuels. This challenge applies to all three countries. As we highlighted in chapter 4, North America’s antiquated electricity grid is ill suited to the task of transporting renewable electricity from areas where it is abundant to areas where it is needed. The current system is also less able to adjust electricity demand to accommodate intermittent renewable sources. Meanwhile, freight transport infrastructure must be updated in order to avoid long waits at the border and encourage more efficient rail, air, and road networks (CEC 2011). The infrastructure needs are especially pronounced in Mexico and may well require external financing—from nascent “green funds” or regional institutions—to support Mexico’s ambitious climate goals and enable it to participate in a future North American climate regime.

Climate policymakers will need to show sensitivity to regional impacts and industrial competitiveness in order to successfully enact climate change legislation. We have highlighted a few options for addressing these concerns in the previous chapters. Undoubtedly, border adjustment mechanisms and free allocations of emissions permits to electric utilities or to vulnerable industries will continue to be examined as a viable mechanism. However, the least trade-distorting and most environmentally sound way to protect industries from competitiveness impacts, prevent regional disparities from becoming more pronounced, and promote capacity building is to harmonize regulations through international accords.

Role of Multilateral Negotiations

For the past two decades, multilateral negotiations have sought to construct a global climate compact that would substantially reduce GHG emissions and promote green growth strategies in developing countries through, *inter alia*, robust networks for offsets and climate finance. A successful agreement that includes emissions reductions from both developed and developing countries would help mitigate competitiveness concerns by leveling the playing field for carbon-intensive industry. In a world where all large emitters enact stringent regulations to reduce GHG emissions, firms would face less incentive to move emissions-intensive production abroad, and thus the risk of carbon leakage would be diminished.²

While international negotiations have made some minor progress, they continue to proceed slowly. The key challenge is to balance the priorities of developed countries with those of the major developing countries. Most developing countries, even relatively advanced ones such as Mexico, do not have as much financial and institutional capacity to reduce emissions as developed countries do. Getting these countries to commit to reducing emissions without substantial financial and capacity assistance from developed countries has been a major challenge for climate negotiators. Developing countries are also reluctant to commit to monitoring, reporting, and verification (MRV)

2. For a much more thorough discussion of this point, see Houser et al. (2008).

of carbon credits. Meanwhile, developed countries are reluctant to accept an agreement that omits emissions limits or MRV for developing countries for the simple reason that no global regime will “work” without significant GHG reductions by China, Brazil, India, and others.

The past two years of international negotiations have made modest progress toward resolving these tensions. During the Copenhagen negotiations in December 2009, the US delegation brokered a compromise committing \$100 billion in assistance from developed countries for climate change mitigation and adaptation in developing countries. In return, major developing country emitters committed to “nationally appropriate mitigation actions.”³

The Cancún Agreements in December 2010 reaffirmed developing countries’ commitment to national mitigation plans and moved countries closer to a proposal for MRV. Developed countries promised to enhance MRV of their financial commitments in return for “international consultation and analysis” of developing country mitigation actions.⁴ The latter includes reporting of countries’ planned actions as well as a timeline for their implementation and an assessment of their effectiveness. It also includes a registry to match planned mitigation actions with the appropriate finance from developed countries. Countries made progress on climate finance, establishing a Green Climate Fund to administer a portion of the \$100 billion promised in Copenhagen. The fund will be governed by a board with equal representation from developed and developing countries, and will be administered by the World Bank. A standing committee of the fund was established to mobilize sources of finance and coordinate MRV of the funds.

As difficult as it has been to obtain pledges that satisfy both developed and developing countries, it will be even more difficult to implement these pledges. One of the biggest concerns going forward is where climate assistance will come from. Both the United States and the European Union provided money toward fast-track climate assistance pledges in fiscal year 2010, but the United States will have considerable trouble mobilizing climate funds in the near future. Although President Obama asked Congress for \$1.9 billion in 2011, both houses of Congress are increasingly reluctant to allocate new funds for international climate aid, and the new leadership in the House of Representatives is not inclined to fund general climate change programs.

Role of North America

The role of North American institutions in addressing the global climate mitigation puzzle is twofold. First, North American institutions have a part to play in supplementing international mitigation efforts, especially where

3. Copenhagen Accord, Paragraph 5, <http://unfccc.int> (accessed on June 8, 2011).

4. The Cancún Agreements: Outcome of the Work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, Paragraph 63, <http://unfccc.int> (accessed on June 8, 2011).

financing and MRV are concerned. Indeed, the Cancún Agreements themselves assign some finance and capacity building to bilateral and regional channels. Although the Green Climate Fund is supposed to administer a large portion of mitigation and adaptation assistance, the agreements call for additional bilateral and multilateral sources to supplement this funding. This is especially true in the case of initiatives for reduced emissions from deforestation and degradation, where bilateral and multilateral capacity-building assistance is needed to establish adequate forest monitoring capabilities and national baseline emissions levels in developing countries.

Second, North America-specific issues (such as border infrastructure, renewable standards, and oil sands regulation) often are better dealt with on a regional platform than in separate bilateral arrangements. Given the large amount of oil, gas, and electricity trade among the three countries, it makes sense for North America to coordinate the decarbonization of its energy supply regionally while the three countries continue to pursue a multilateral accord. For example, with regard to carbon sequestration, it would make sense to coordinate mapping of carbon capture and storage (CCS) sites.

In addition, most of North America's actions on climate change are currently conducted on a subnational level. Multilateral negotiations are ill-suited to dealing with these state measures, as individual states by and large do not participate in them. By contrast, trilateral coordination of state actions is feasible, and there is much that can be done to harmonize renewable portfolio standards and regional cap-and-trade regimes. Due to its smaller scale, the regional platform is also better for addressing the various intranational disparities highlighted in previous chapters.

North American leaders have worked together on energy issues for the past decade. During the early 2000s, the North American Energy Working Group produced a series of reports on cross-border electricity regulation, natural gas production, and energy-efficiency standards and labeling. More recently, in 2009, the North American Leaders' Summit (NALS) pledged a number of actions related to clean energy development. The countries agreed to develop a trilateral working plan on climate change and clean energy to be considered at the subsequent NALS meeting, which will take place in 2011. The plan will support, *inter alia*, the following actions:

- financing mechanisms to support mitigation and adaptation actions, including Mexico's Green Fund;
- comparable approaches to measuring, reporting, and verifying emissions reductions, a prerequisite for any future North American emissions trading regime;
- work to limit gas flaring;
- collaboration on smart grid interoperability standards;
- cooperation on carbon capture and storage projects;
- alignment of national energy-efficiency standards;

- reduction of GHG emissions in the oil and gas and transportation sectors (which account for a large share of GHG emissions in Mexico); and
- cooperation on sustainable forest management, and on methodologies for quantifying and managing programs to reduce emissions in the forest sector.

In particular, the NAFTA leaders floated the idea of a North American carbon capture and storage partnership. Under the proposed initiative, countries would develop a consensus on the methodology to be employed in estimating the CO₂ storage capacity of various North American sinks. With a common methodology in place, the countries would create a North American carbon atlas, where data from different states, provinces, and organizations regarding carbon sources and sinks could be viewed in a common format. The partnership would also foster collaboration on research and development related to CCS.⁵

North American leaders have also engaged in bilateral talks on energy. In February 2009, the United States and Canada launched the Clean Energy Dialogue, which seeks to promote the “development of clean energy technologies to reduce greenhouse gases and combat climate change.”⁶ The dialogue established working groups on carbon capture and storage, smart grid infrastructure, and clean energy research and development. In April 2009, the United States and Mexico established the Bilateral Framework on Clean Energy and Climate Change, which promises training and infrastructure to promote clean energy technologies.⁷ In May 2010, Presidents Obama and Calderón created the Cross-Border Electricity Task Force to promote regional renewable energy markets.

Energy and climate initiatives have also reinvigorated cooperation within NAFTA. During the August 2010 Commission for Environmental Cooperation (CEC) ministerial meeting in Guanajuato, Mexico, EPA administrator Lisa Jackson praised the “open and transparent dialogue” that the three North American environmental ministers shared within the CEC Council—and that contrasted sharply with the disengaged approach of ministers to NAFTA initiatives earlier in the decade.⁸ At this meeting, the council resolved to augment collaboration on improving the comparability of GHG emissions

5. Joint statement by North American leaders Felipe Calderón, Stephen Harper, and Barack Obama, August 10, 2009, www.whitehouse.gov (accessed on June 8, 2011).

6. White House, President Obama and Prime Minister Harper Vow Joint Effort on North American Economic Recovery, Office of the Press Secretary, February 19, 2009, www.whitehouse.gov (accessed on June 8, 2011).

7. White House, U.S.-Mexico Announce Bilateral Framework on Clean Energy and Climate Change, Office of the Press Secretary, April 16, 2009.

8. Remarks by Lisa Jackson at the welcoming reception for the Commission for Environmental Cooperation Council, Guanajuato, Mexico, August 16, 2010, <http://yosemite.epa.gov/opa> (accessed on June 8, 2011).

data gathering, methodologies, and inventories and systems; the goal was to share climate change information in order to support GHG reductions in North America via mitigation and adaptation projects. The council also resolved to support various public-private partnerships to encourage the transition to a lower-carbon economy, for example in the area of green building.

Policy Recommendations

The NAFTA leaders have begun to explore areas where North American cooperation on climate change could have value and produce concrete results. To be sure, the political environment is not ripe for ambitious legislation on climate change; there is little political will, except in certain scattered states and provinces, for stringent measures. However, there is a broad range of climate initiatives that could advance in the current political environment and that could promote mitigation of GHGs and adoption of new and greener technologies throughout North America.

NAFTA's work on climate change could be significant, both in reinforcing North American economic integration and promoting sustainable development. To those ends, NAFTA institutions should coordinate, harmonize, and facilitate climate change regulations in the region. A successful North American climate change framework could also propel multilateral talks by creating precedents for North-South cooperation on climate change—precedents that could help inform ongoing international efforts to develop a post-Kyoto regime. The following are our recommendations for near-term, practical steps that the NAFTA countries could take in confronting their interrelated climate change challenges.

Harmonize Energy Regulations

1. Study options for coordinating or integrating evolving carbon regimes, at both the federal and state levels.

During the period when national carbon-trading schemes seemed likely in the United States and Canada, there was some discussion of a trilateral carbon market as a way to ensure a uniform price for GHG emissions and thereby apply the same regulatory burden to energy-intensive industries in all three NAFTA countries. This idea has since lost substantial political backing. Though the US EPA seemingly has the authority to put in place a cap-and-trade system for large GHG emitters, this option would prove politically explosive. Instead, the EPA is likely to embrace more modest energy-efficiency performance standards. Following suit, the Harper government has shelved its own cap-and-trade proposal.

Still, harmonized markets for GHG permits, GHG offset credits, renewable electricity, and renewable electricity credits might be created for firms in states and provinces that participate in regional regulatory regimes such as cap-and-trade and renewable portfolio standards. Streamlined markets for

permits and credits would in turn make it easier for firms in jurisdictions that will not adopt climate policy to develop low-carbon technologies and receive money for emissions reductions.

Markets that are relatively easy to access and have low transaction costs could provide a source of revenue to finance Mexico's climate change goals. The sale of carbon offsets or renewable energy toward compliance with US or Canadian standards cannot produce additional emissions reductions for Mexico—in other words, these reductions would be credited toward the United States or Canada, not Mexico, in any trilateral or international climate change regime. However, these reductions could spur additional investment in low-carbon infrastructure and technologies, helping Mexico along the path to reach its climate change targets.

What could be done, particularly at the subfederal level, to integrate carbon and renewable energy markets? Previous chapters have pointed out the value of linking nascent regional cap-and-trade programs such as the Regional Greenhouse Gas Initiative and Western Climate Initiative; of streamlining markets for renewable electricity certificates (RECs) used to comply with state renewable portfolio standards; and of using regional institutions to certify carbon offsets used toward compliance with state and provincial regulations. In these areas, the NAFTA CEC could use its prior experience collecting North American emissions data to play a role in monitoring and reporting emissions reductions.

2. Standardize definitions of renewable energy and coordinate policies.

The United States and Canada share a large volume of cross-border electricity trade; this trade accounts for 6 to 10 percent of Canadian annual generation and up to 37 percent of electricity consumption in certain US border states.⁹ Consequently, policies that affect renewable electricity production and consumption in Canadian and US border states necessarily have spillover effects on production and consumption in the neighboring country.

Currently, definitions of renewable energy vary widely among states and provinces, complicating regulation of renewable electricity from across the border. The major differences between US and Canadian regulations lie in the eligibility of hydropower to meet renewable standards. Both sides should make virtue out of necessity and agree on how imported electricity should be credited and certified under renewable portfolio standards, at both the federal and state levels. To the extent feasible, states and provinces should harmonize definitions of renewable electricity in order to stimulate renewable electricity development by increasing the liquidity of REC markets.

3. Improve cross-border transmission capacity between the United States and Mexico and between the United States and Canada.

9. See the National Energy Board, *Electricity Exports and Imports: Monthly Statistics for December 2009*, www.neb-one.gc.ca (accessed on June 9, 2011).

Because US-Mexico electricity transmission is inadequate, the ample wind and solar resources in the Mexican border region—some of the best in the world—aren't being sufficiently exploited and sold to the United States. As we highlighted in chapter 4, additional cross-border transmission would allow firms pursuing renewables projects to take advantage of economies of scale; in fact several firms have already located generation sites along both sides of the border in the hopes of scaling up generation for both markets (Wood 2010).

Additional transmission would allow states to adopt more stringent renewable electricity standards by expanding the base of renewable energy available, thereby lowering the cost of compliance. Because Mexican renewable electricity generators near the border could sell electricity at a premium to meet these standards, the transmission would help make solar and wind power more competitive relative to conventional fuels. Transmission upgrades could thus accelerate the development of renewable infrastructure on both sides of the border.

Both Canada and the United States have examined the possibility of revamping the electric grid so that it can better adapt to real-time fluctuations in electricity demand and supply. Such a smart grid is a crucial component in improving energy efficiency and developing renewable energy. A smart grid can better balance multiple variable sources of electricity and manage demand for electricity, allowing utilities to avoid installing additional capacity to meet peak loads. Smart grid pilot programs already exist in several US cities, as well as the Canadian province of Ontario.

In order to construct a seamless North American smart grid, the United States and Canada need to resolve several issues. Transmission congestion currently presents a problem for both countries and they need to coordinate where new transmission should be placed. From there, states and provinces on both sides of the border need to agree on common regulations for transmission construction and on common interoperability standards once these transmission lines are built.

4. Work together to reduce GHG emissions from the oil sands, and coordinate investment in carbon capture and storage.

The oil sands provide energy security to the United States and Canada, but they continue to produce significantly more GHG emissions than conventional oil despite recent improvements in mining and processing technologies. Both countries require an intelligent strategy to reduce emissions from transport fuels while still ensuring that enough oil is produced to meet short-run demand.

Ultimately, the way to achieve both goals is conservation—and oil conservation measures need to be stepped up soon to shield consumers from price increases that are expected to occur whether the oil sands are developed or not (EIA 2011a). Though Canada bills its oil as “energy-secure,” the fact is that under the business-as-usual scenario, rising North American oil demand will increase financial transfers not just to Canada but also to the Middle East

and Venezuela. Policies that encourage development of renewable energy and lower-carbon technologies and that promote conservation are much needed and should encompass, *inter alia*, more stringent fuel efficiency standards and additional investment in low-carbon biofuels.

Though California's low-carbon fuel standard has encountered much criticism in Canada, it could provide an important vehicle to spur investment in alternative fuels. As we pointed out in chapter 2, the standard requires some adjustment to ensure that it does not draw arbitrary distinctions between fuels, violating international trade law. California should consider adding nuance to its life-cycle analysis by separating the basket of "conventional oil" used in California into various categories based on weight, type of extraction, etc. This would make it easier to justify giving oil sands its own separate category, and it would ease concerns that heavy crudes such as those extracted in California are being given special treatment. The downside is that this approach would be more expensive—both administratively and to the California refining industry, whose oil would face a disadvantage compared to lighter, less GHG-intensive fuels.

In addition to investing in alternative fuels, the United States and Canada need to improve methods for carbon sequestration. Substantial research already has been undertaken on CCS, which has the potential to reduce GHGs from oil sands production. If CCS can be successfully commercialized, and if the cost can be lowered sufficiently—both big "ifs"—the technology could benefit both the United States and Canada. CCS deployment, if successful, could help smooth over the regional tensions between GHG reduction and employment in carbon-intensive industries referenced earlier in this chapter and in chapters 2 and 3. It would sharply reduce the GHGs produced from the coal-fired power plants prevalent in many US regions, allowing coal producers to better adapt to climate change legislation and reducing economic dislocation in coal-producing states in the event of stringent GHG regulations. It might also make western Canada's oil-producing provinces more amenable to an ambitious Canadian carbon reduction regime. Toward this end, the United States and Canada should follow through on their commitment to coordinate mapping of sinks and sources for CCS.

At the same time, it is important to have a realistic assessment of the possibilities and limitations of CCS and other technological improvements on the horizon. CCS is not yet fully proven at commercial scale, and it is likely to be exorbitantly expensive when first introduced. Development and commercialization of CCS are at least a decade away, and the cost and feasibility are yet uncertain. In the meantime, the rapid expansion of oil sands production represents a significant source of emissions growth, even as Canada promises to significantly reduce its emissions in the near and medium term. As discussed in chapter 3, the Canadian economy has less low-hanging fruit for emissions reductions than the US economy. It will be difficult for Canada to achieve significant enough emissions reductions from other areas of the economy

to compensate for rapid oil sands growth and meet its 2020 Copenhagen targets—to do so would put a strain on non-oil-producing provinces, many of which have large manufacturing sectors.

In the long run, the prospects for the oil sands differ from the prospects for coal; while coal can theoretically be made emissions free, the oil sands cannot. Approximately 70 to 80 percent of the emissions from oil—whether produced from the oil sands or by conventional means—ultimately come from burning the fuel in vehicles rather than in smokestacks, and CCS cannot be applied to mobile sources (NETL 2009). Even assuming successful commercialization of CCS, the problem remains: Over the long term, all three North American countries must sharply reduce consumption of oil in their cars and trucks in order to achieve emissions levels consistent with the need to sharply constrain global warming. New technologies—alternative fuels, electric cars, and fuel efficiency improvements, among others—must slowly replace oil consumption, including consumption of oil sands products. This can occur only as countries adapt to less energy-intensive production and consumption.

Clarify International Trade Law to Avoid New Trade Barriers; Avoid Interpretation of Existing Trade Law in a Way that Would Jeopardize Climate Change Regulations

5. Avoid new trade barriers.

When policymakers craft climate change legislation, they often include provisions that explicitly erect trade barriers for competitiveness reasons or implicitly restrict trade due to specific regulatory requirements. Many are motivated by pressures to prevent domestic industries from moving to unregulated areas where production costs are lower: Border adjustments and subsidies to regulated industries fall into this category. Others, such as the United States' biofuels restrictions and the domestic content requirements of Ontario's Feed-In Tariff, are motivated by the desire to promote domestic firms over foreign competitors.

In the near term, border adjustments should not be used to equalize costs between domestic and foreign producers, as these measures are likely to be emulated or provoke retaliation by other countries. Ideally, World Trade Organization (WTO) rules and climate treaty obligations should address competitiveness concerns in a manner that achieves the environmental objectives without undercutting world trade norms.¹⁰ Without such guidelines, there is likely to be a rash of overzealous litigation or new protectionist measures. Because such a framework would take a few years to develop, the three NAFTA

10. Hufbauer, Charnovitz, and Kim (2009) suggest that WTO members negotiate a code of good conduct for trade-related climate change measures and lay out the details of what such a code might look like.

partners should agree to a temporary moratorium on new border measures related to climate change policies. This is particularly necessary in light of current regulatory uncertainty in all three NAFTA countries.

Border adjustments are not the only measures that should be avoided; various types of climate-related subsidies can be trade distorting and would benefit from NAFTA discipline. One category of subsidy is the rebates offered by state and federal cap-and-trade proposals to carbon-intensive industries. In the cap-and-trade regulations in California's Assembly Bill 32, and in previously vetted US cap-and-trade bills such as the American Clean Energy and Security Act, compensation is conveyed in the form of free allowances to firms that are vulnerable to foreign competition and would otherwise face significantly higher production costs under cap-and-trade schemes. The purpose of these subsidies is to prevent these firms from moving to unregulated jurisdictions. Some version of this rebate program may be necessary to allay fears of carbon leakage and obtain political support for future passage of a cap-and-trade program. Nevertheless, if such rebates are needed to cement political support for the climate program, they should be divorced from export performance, to the extent possible, and the amount rebated should not exceed firms' actual costs incurred under the cap-and-trade program.

"Green subsidies" for renewable energy and energy efficiency should be deployed judiciously to spur research but not to pick winners for commercial development. States, provinces, and countries should ensure that these subsidies are targeted to the goal of reducing GHG emissions and do not discriminate based on where the materials used for production originate. Domestic content requirements such as Ontario's could ultimately increase the cost of transitioning to low-carbon energy, because they exclude energy produced using cheaper imported turbines and solar panels. Ontario's feed-in tariff has also produced tension within the world trading system; three countries have litigated this provision in WTO dispute settlement. In order to avoid raising costs and provoking litigation, subsidies should be designed to produce as little trade distortion as possible.

Restrictions on government procurement have inhibited construction of environmental projects in other cases as well. A particularly egregious example is the spate of "Buy American" provisions, which require iron, steel, and manufacturing goods used in construction projects to be produced using 100 percent US-content materials. Recognizing the negative impact of this provision on supply chains that are heavily integrated across the US-Canadian border, the United States and Canada negotiated a supplemental procurement agreement in 2010 that removes significant obstacles facing US and Canadian firms when bidding on public contracts. In essence, the deal provides Canada a waiver on the Buy American provisions in exchange for a lifting of Canadian provincial procurement requirements. However, some provinces have excluded important environmental projects such as public transit infrastructure from the waiver. Meanwhile, the United States limits its Buy American exemp-

tions to procurement by seven programs,¹¹ and access to US state government procurement contracts applies only to the 37 US states that have signed the WTO Agreement on Government Procurement (Sosnow and Peaker 2010). Going forward, both countries should recognize the importance of US-Canada economic integration to firms participating in government-funded environmental projects, and each country should remove domestic content restrictions for all NAFTA suppliers of publicly financed environmental projects.

As discussed in chapters 2 and 3, domestically produced ethanol is heavily subsidized and protected in both the United States and Canada. The United States currently imposes a 54 cent per gallon tariff on imported ethanol, and Canadian tariffs for non-NAFTA ethanol range between 3 and 6 percent, or about 10 cents per liter. This system of subsidies and tariffs is a lose-lose situation: taxpayers suffer because of the high cost of the subsidies, and the climate suffers because the corn-based ethanol produced in the United States and Canada generates more GHGs than conventional gasoline by some measures.¹² Trade relations with other major ethanol producers such as Brazil are strained by this blatant show of protectionism. Foreign sugarcane-based ethanol production emits much lower levels of GHGs, but high tariffs undercut the competitiveness of these supplies in the US market. Both countries should reduce the tariffs and the subsidies and allow ethanol from sugarcane and other feedstocks to play a larger role in the domestic fuel market.

In sum, the combination of climate change and energy-related trade measures should be avoided where possible. Subsidies, when needed for legitimate environmental purposes, should be narrowly designed with an eye toward minimizing trade frictions. This will help reduce economic distortions and prevent trade disputes from detracting from the overall goal of mitigating climate change.

6. Establish a “safe harbor” to shield climate change taxes and regulations from claims under the indirect takings provisions of NAFTA Chapter 11.

Chapter 11 requires governments to provide compensation to investors for measures that are “tantamount to expropriation.” To date, Chapter 11 rulings have deflated excessive expropriation claims filed by NAFTA petitioners seeking redress from environmental laws and regulations. Moreover, when awards were granted, they generally were a small fraction of the amount sought by the claimant.

11. These programs are narrowly defined. They include the Department of Agriculture’s Water and Waste Disposal Programs and Community Facilities Program, the Department of Energy’s Energy Efficiency and Conservation Block Grants and State Energy Program, the Department of Housing and Urban Development’s Community Development Block Grants and Public Housing Capital Fund, and the EPA’s Clean Water and Drinking Water State Revolving Funds.

12. Nobel laureate Paul Crutzen and coauthors (2008) have argued that corn-based ethanol produces more carbon when land use changes are taken into account, as corn grown for ethanol displaces food crops.

But past experience is not necessarily instructive for prospective cases targeting climate policies. Climate change laws and regulations will most likely have much broader economic effects than prior environmental legislation, and the scope of potential claims under NAFTA Chapter 11 due to climate change laws and regulations could be orders of magnitude greater than the scope of claims filed in the past. The potential for such Chapter 11 litigation against climate change laws could both slow the implementation of measures designed to mitigate GHG emissions and adversely affect flows of trade and investment in the region.

To prevent this outcome, the three NAFTA countries should clarify the definition of expropriation under Chapter 11 to exclude good-faith efforts to combat climate change. Efforts that should be permissible include taxes levied on firms' GHG emissions output, regulations requiring firms to achieve a certain level of emissions reductions, and regulations requiring firms to use best-practice technologies. These taxes and regulations should not be arbitrary and should be subject to appropriate public review processes. This compromise would allow states, provinces, and federal governments to pursue climate objectives without regulatory chill and would avoid lengthy and costly litigation that could delay needed environmental projects.

Use NAFTA Institutions to Support Individual Climate Actions

7. Use NAFTA institutions to support Mexico's climate change plans.

The North American Development Bank (NADB) and Border Environment Cooperation Commission (BECC), two interrelated institutions that fund environmental projects on the US-Mexico border, should provide financial and technical assistance for energy-saving and pollution control projects in support of Mexico's ambitious climate change policies. The NADB has a capital base of \$3 billion, but its track record has been spotty (Hufbauer and Schott 2005). At the outset, NADB lending was constrained due to high interest rates, a cumbersome application process, and a focus on wastewater treatment projects to the exclusion of other worthy environmental investments. Over the past decade, however, the NADB/BECC procedures have improved substantially; as a result, the portfolio of subsidized loans has grown markedly (Kass and McCarroll 2008). The cumulative amount of the loans contracted has increased twenty-fold in the past decade, from \$24 million in 2001 to \$570 million in 2011. The total amount of funding under NADB grants increased from \$350 million to \$650 million in the same time period.¹³

While the scope of the NADB/BECC has officially expanded to include renewable energy and energy efficiency, these projects still make up a tiny portion of the institutions' overall lending portfolio; the BECC has certified

13. North American Development Bank, Annual Report: April 1, 2002–March 31, 2003 and Quarterly Status Report: March 31, 2011, San Antonio.

only 3 clean energy projects out of 177 projects to date.¹⁴ Current climate-related projects include a \$3 million loan for biodiesel and a \$60 million solar loan. The NADB could substantially increase loans to these types of projects without cutting very much into its capital base.

NAFTA facilitation of carbon offset sales from Mexico, as described in the first recommendation above, could also generate revenue that could be put toward climate change measures. Carbon offsets do not necessarily substitute for outside climate assistance, as they provide no additionality—Mexican emissions reductions financed by carbon offsets would otherwise occur in the jurisdiction imposing the regulations with which the offsets are used to comply. In the absence of additional financing, however, they might serve as a way to build infrastructure for low-carbon development and to incentivize fledgling companies to enter markets for clean energy and transport vehicles.

8. Use the Commission for Environmental Cooperation as a clearinghouse for climate change-related data.

The CEC discussed responses to climate change in the mid-1990s but failed to take concrete action. Subsequently, NAFTA officials put climate change on ice. Since 2009, however, the issue has gained salience on the NAFTA agenda. North American environmental ministers now regard the CEC as a useful forum for trilateral cooperation on the nexus of energy and environmental issues that are crucial to the achievement of each country's climate policy goals.

To date, the CEC has been plagued by a broad mandate and a narrow financial base. Its charge is to amass environmental information, provide recommendations on trilateral environmental issues, and promote environmental law enforcement—all on a \$9 million annual budget.¹⁵ Although the CEC has been effective for its size, its budget constrains the scope and effectiveness of its operations (Hufbauer and Schott 2005).

The CEC should focus its resources on a few issues of primary importance, and climate change is a natural candidate for that list, given the magnitude of the problem and its significance to the future of the North American economy. The CEC's climate agenda should be targeted at initiatives that help inform policy implementation in each country. Its comparative advantage lies in its capacity to amass information from a number of different sources and consolidate it into a product that is useful across jurisdictions (Craik 2010). A prime example is its North American Pollutant Release and Transfer Register (NAPRTR) program, which collects toxics data from the three North American countries and inputs them into a standardized, firm-level database. The NAPRTR program has successfully raised awareness of environ-

14. North American Development Bank, Quarterly Status Report: March 31, 2011, San Antonio.

15. The amount of money allocated to the CEC has remained unchanged since its creation in 1994, despite inflation and exchange rate movements (the budget is expressed in dollars, while the CEC is located in Montreal and incurs most of its expenses in Canadian dollars) that have decreased the real value of this amount. See Hufbauer and Schott (2005).

mental challenges. Not only has it enhanced the accessibility of environmental reporting, but it has enhanced the reporting itself; the NAPRTR program led and supported Mexico in developing its own pollution tracking registry.

With modest budgetary increases, the CEC could play a similar role in NAFTA climate change initiatives and become a clearinghouse for data on all North American emissions, including GHGs. All three countries have GHG emissions inventories, even though not all of them include GHGs in the data sets that they report to the CEC. Collecting, consolidating, and mapping these data should be part of the CEC's domain. The CEC has already incorporated this goal into its strategic objectives for 2015 and has begun laying the groundwork for a project in this vein.¹⁶

By making detailed GHG emissions information easily available across the three North American countries, the CEC could facilitate monitoring, reporting, and verification of carbon credits issued under national or regional carbon regimes. Facilitating MRV could in turn lower transaction costs for offset projects among the three countries and increase the credibility of national inventories, thus supporting fungibility and the integrity of possible offset investments in Mexico and elsewhere. These results could be a boon for low-carbon development in states and provinces that do not immediately choose to join regional efforts to reduce GHG emissions. They could also facilitate low-carbon development in Mexico.

The CEC should also report on new climate initiatives and regulations in each country. A single, harmonized database of climate change laws and regulations could assist trilateral collaboration by highlighting areas of synergy and tension among the three countries' policies. Such a database would fit well into the CEC's current work plan; a draft 2011–12 project proposal recommends that the CEC create an online platform to enable North American government officials to share data related to climate change.¹⁷

Summing Up

Broadly, North American climate and energy policy must accomplish three goals to be successful. First, it must reduce GHG emissions—and not simply displace those emissions elsewhere. The threat of carbon leakage provides a disincentive for states and provinces with energy-intensive industries—precisely those that most need to reduce emissions—from pursuing adaptation and mitigation strategies.

Second, it must ensure that the cost of reducing emissions is manageable; only in this way will it encourage adaptation and avoid a political backlash.

16. Commission for Environmental Cooperation, Project 2: Improving Comparability of GHG Emissions Data, Methodologies and Inventories in North America, www.cec.org (accessed on May 8, 2011).

17. Commission for Environmental Cooperation, Project 11: North American On-line, Interactive Informational Platform on Climate Change (draft), www.cec.org (accessed on May 8, 2011).

Reducing GHGs will require changes in the way firms and individuals produce and consume goods. Production and consumption must use cleaner forms of energy and become more energy efficient. NAFTA policymakers will face strong resistance to climate programs unless they can ease the transition by reducing and spreading out over time the costs to consumers and local industries. The transition to a lower-carbon economy could be undercut if high economic costs encourage policymakers to compensate consumers and industries by providing subsidies that dampen incentives to conserve or adopt new low-carbon energy technologies.

Third, it must equitably distribute costs so that they are shared across different regions of the continent. Legislative politics requires appeasement of local constituencies; skewed distribution of the compliance costs would complicate the task of securing political support from politicians representing the losing regions. Failure to balance the costs could also lead politicians from the losing regions to seek exemptions from the rules of the climate regime in order to lessen the impact on their constituents. Such an outcome would ultimately reduce the effectiveness of climate policy and increase costs for the entire economy.

At the outset of this chapter, we revisited some of the challenges faced in meeting these goals. In order to contribute to global emissions reductions, policymakers must grapple with both the real and perceived tendency for taxes and regulations to cause emissions to migrate over the border into unregulated jurisdictions. They must deal with wide differences in energy consumption and production patterns. The United States and Canada must bring Mexico into a trilateral regulatory regime. And the infrastructural deficit must be remedied so that clean energy can find its way from the areas that are best for producing it to areas that need to consume it.

To address these challenges, North America eventually needs an integrated carbon market. A large, integrated market would confer significant economic benefits that would allow all three countries to achieve the goals stated above. Greater uniformity of regulations would prevent GHG-intensive firms from moving to or selling to unregulated jurisdictions in order to escape climate-related standards. An integrated carbon market would produce efficiency gains by allowing firms to find the cheapest GHG reductions available in North America. As we pointed out earlier in the book, this could be especially important to Canada, where the cost of cap-and-trade is expected to be significantly higher without policy harmonization and market linkage with the United States. Finally, a large market would provide liquidity, reducing price volatility.

Our recommendations will not create this carbon market, but they do lay the groundwork for coordinating future action toward that end. By using North American institutions to reduce the transaction costs of trading emissions credits, North American countries can encourage states, provinces, and individual firms to participate in nascent state and local regimes. Although state and provincial carbon and renewable electricity markets represent only

a portion of total North American emissions, harmonization of these local regulations, to the extent possible, would also be a move toward an integrated North American carbon regime. Investment in transmission infrastructure along the US-Mexico and US-Canada borders would afford renewable electricity a wider customer base and allow generators to take advantage of renewable electricity premiums in other jurisdictions.

To provide a stable, predictable regulatory environment and prevent costly litigation, countries need to clarify certain provisions of international trade law, including Chapter 11 and codes regarding border adjustments and climate subsidies. Litigation reduces regulatory certainty, making firms more reluctant to make the investments needed to comply with regulations. Consistent, clear rules can prevent abuses of international trade law while offering policy predictability to firms and jurisdictions that follow the rules. Meanwhile, avoiding new trade barriers will help preserve the open energy market that North America depends on.

Our recommendations provide a way for individual North American countries to adopt policies to achieve climate goals. Even if these recommendations are acted on, passing climate legislation remains an uphill battle in all three countries. By taking steps to smooth out regional tensions and by providing a framework for an integrated market, however, North American countries can make it easier to pass climate bills in the future and can make the bills eventually enacted more effective.

Climate change policy surely poses challenges for trade and investment in North America, but the problem of climate change also presents an opportunity to deepen ties among the three North American countries. While areas of tension do exist, there are numerous synergies to be exploited. Ultimately, the NAFTA partners share the same priorities: energy security, climate change mitigation, and economic growth. The United States, Canada, and Mexico should build on these common goals to build a foundation for a prosperous future.