



Cutting Greenhouse Gas Emissions is Possible and Even Profitable

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August 2003

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1 Preface

This is a time of tension between the US and a number of allies over issues ranging from climate change and Kyoto Protocol, genetically modified crops and food chain security, or Iraq to the role of science in policy-making, the International Criminal Court, or the use of hormones in food. Progress is difficult on some of these issues, in spite of considerable efforts on both sides of the Atlantic.

"Policy learning", the exchange of experience about practical aspects of policy-making and implementation, provides a way out of gridlock. Whenever practitioners come together to tell their stories and listen to those of their counterparts from other nations, the focus shifts to actual decision-making challenges, and the most immediately beneficial ideas are selected for adaptation and possible adoption. The harvesting of policy solutions builds on positive and negative experiences and is based on evidence. This works best at state, regional and local levels, and with non-governmental actors such as those in business, religious institutions, or universities, where results matter more than positions.

In processes of transnational policy learning, it is important to focus on the right examples, the useful lessons, which can be assured through appropriate scoping and facilitation techniques, and through a wise selection of participants, sources, and case studies. Ecologic has long had a strong role in drawing and disseminating policy lessons and managing policy learning processes, in a number of issue areas and constellations. In Germany, the Länder (states) act as laboratories for solution in policy instrument design and implementation, and provide a competitive setting for innovations in environmental policy. The Member States of the European Union build harmonizing policies on exchanges about problem definition and policy approaches, and policy learning plays an important part also in the implementation of European legislation.

Ecologic also facilitates the dissemination and diffusion of policy lessons across the Atlantic, with similar levels of development, administrative capacities, and popular pressures to reform policies and protect the environment as a common heritage. We thus contribute to the improvement of transatlantic relations as well as environmental policy and the integration of environmental protection requirements into other policy areas.

We are grateful to Michael Northrop of the Rockefeller Brothers Fund for his long-standing support for transatlantic exchanges particularly on climate protection, carbon trading and other energy policy measures, and for the insights documented in this contribution. I recommend it to readers in North America, in Europe and beyond.

This paper on the benefits of reducing greenhouse gas emissions is published on our web site in the hope that it may stimulate further productive dialogues and debates, and that it may encourage wider participation the contribution of fruitful ideas to solve problems we have in common.

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August 2003

2 Introduction

In an unprecedented meeting in May 2003, leading corporate and government greenhouse gas reducers from the United States, Canada, Europe, and Australia offered upbeat accounts of their efforts to address climate change.¹ Presentations from a wide range of corporate and government participants suggest that not only is it possible to reduce greenhouse gas (GHG) emissions, but that it is also cost effective—even profitable—to do so.

This short paper starts with a overview of activities successfully implemented by business (section 3) before turning to governmental actors setting the policy and regulatory framework. Section 4 presents examples of action by national governments (or federal governments such as in Germany), and section 5 focuses on initiatives by local authorities and city governments. Outside the United States, the approaches taken by state governments in the US are currently observed with heightened interest, and the current situation is summarized in section 6. On this basis, a number of observations are made in section 7 before conclusions are drawn at the end.

3 Corporate Success Stories

Between 1990 and 2000, U.S. chemical maker **Dupont** reduced its GHG emissions by 40 percent across all of its international operations while holding energy use flat and increasing its output by 40 percent. In 2000, the company committed to reducing emissions by an additional 25 percent by 2010. Progress is coming so fast that Dupont is already closing in on a total reduction of 75 percent from its 1990 levels. By 2010, the company aims to have 10 percent of its energy needs coming from renewable energy sources, and hopes to steadily increase this percentage over time. How did Dupont do it? "Lots and lots of little things," says the company official in charge.

Oil giant **BP** has cut its GHG emissions by 20 percent through the development of an internal carbon trading system that zeros in on the lowest-cost reductions. The company spent just over \$20 million dollars to carry out its internal reductions strategy and has realized almost \$650 million in savings. Senior BP management was so surprised by the results that they moved responsibility for this work away from the environmental affairs division and installed it into line business units. Executives say they are confident there is at least another \$650 million in value to be realized from the next step in reductions efforts. These shorter-term goals are also being complemented with a longer-term objective of "de-carbonizing" the company's fuels.

Cement, as an industrial sector, is one of the largest emitters of greenhouse gases, producing about 5 percent of global emissions. As the world's largest cement manufacturer, **Lafarge** produces twice as many GHG emissions as Switzerland. By changing its manu-

¹ Conference of the Reducers, May 11th to 13th, 2003, The Netherlands. This meeting was convened by the Center for Clean Air Policy, RIVM, the German Marshall Fund of the United States, and the Rockefeller Brothers Fund.

facturing processes, however, Lafarge has reduced its GHG emissions by nearly 11 percent below its 1990 emissions levels; by 2010, the company wants to reduce emissions by a total of 20 percent per ton of cement. Lafarge is keen to continue this work since it is realizing significant cost savings and strengthening its future competitive edge in its industry. Other manufacturers are following Lafarge's lead. By doing so, the industry as a whole is positioning itself to make a significant dent in global emissions.

IKEA, the international home furnishings retailer, has set several goals for itself. It will reduce energy consumption by 10 percent across all of its international operations by the end of 2003, and plans to switch 10 percent of its heat and electricity to renewables by the end of 2005. The company also aims to reduce carbon emissions from transported goods by 15 percent across its European operations and increase the share of goods coming to its stores by rail from 20 percent to 40 percent by the close of 2006. IKEA also plans to have 75 percent of its stores accessible to mass transit by the end of 2005, and hopes to increase home shopping and home delivery services to reduce the need for its customers to drive to stores.

Participants at the reducers meeting also heard about experiences at **Entergy**, a New Orleans-based energy utility; **Nuon** a Netherlands-based power company; **Interface**, an Atlanta-based carpet manufacturer; **Stora Enso**, the Finnish forest products company, **The Body Shop**, a U.K. based cosmetics retailer, and **DHL Nordic**, the Stockholm-based arm of the international package delivery company. Each has made commitments to reducing company emissions and each believes it is gaining financial rewards from its actions.

4 Nations in Action

Many national governments are also making progress on climate change. **Germany**, which boasts the world's third largest economy, has already reduced emissions by 19 percent below 1990 levels and expects to achieve its 21 percent target easily by 2010. German officials now think they can lower emissions by 40 percent by 2020. Germany is also moving aggressively to develop renewable power; it installed 1200 MW of new wind turbines in the past year and now has more installed wind capacity than the U.S. Overall, Germany's program is multifaceted and includes scores of programs to support reductions. Building retrofits, energy efficiency, incentives for increased renewable energy generation, innovative finance schemes, and tax law changes are all having an impact. Recent studies undertaken by the German government indicate that these actions will stimulate economic growth, exports and employment, and ultimately make Germany more competitive.

In 1997, the **United Kingdom** said that it would achieve a 12.5 percent reduction in greenhouse gas emissions by 2010. A national emissions-trading scheme and a corporate reductions program that involves 44 industrial sectors and 6,000 companies have exceeded expectations, reducing emissions faster and more cheaply than expected. Based on this positive experience, the Blair government announced in early 2003 its intention to cut emissions by a total of 20 percent by 2010. Prime Minister Blair also announced his government's intention to put the U.K. on track to reduce its emissions of CO₂ by 60 percent by 2050. A detailed study by the U.K.'s Department of Trade and Industry concluded that the

economic costs of these actions in the U.K. would be small, costing the U.K. about six months of GDP between now and 2050. And these calculations make no effort to tabulate the benefits of climate action, but these are believed to be substantial. In a more recent development, the U.K announced its intention to have 10 percent of the nation's electricity come from offshore wind by 2010.

In Brussels, meanwhile, **European Union** policymakers have initiated an ambitious legislative agenda. As a start, a European-wide emissions trading scheme that will seek least-cost, continent-wide reductions was approved in June 2003. This development alone is significant, but it is only the beginning of an impressive legislative agenda geared to addressing climate change. Between now and 2008, the EU plans additional climate-related legislative action on equipment standards, demand-side management, combined heat and power, procurement, transportation, infrastructure, bio-fuels, and fluorinated gases. All 25 EU nations, including the ten recently admitted accession countries, will be subject to these resulting laws and regulations.

Other European nations such as **Sweden, France, Denmark** and **The Netherlands** have also made significant reductions commitments. Sweden has recently committed to a 50 percent reduction by 2050 and has called for a European-wide target of 60 percent by 2050. France has also taken a very aggressive position regarding its longer-term commitment, promising to reduce emissions by 75 percent by 2050. Denmark, meanwhile, has renewed its commitment to a 21 percent reductions target by 2010. Wind now generates 20 percent of Denmark's electricity needs. In the Netherlands, policymakers are developing a detailed 50 year plan for GHG reductions.

In North America, **Canada** recently ratified its 6 percent Kyoto reductions target and is finalizing a national implementation plan. The Canadian province of **Manitoba** has decided that reducing GHG emissions should be the centerpiece of a comprehensive economic development plan. Starting with its commitment to meet or exceed Kyoto by 2010, Manitoba has instituted an array of measures to reduce emissions in the short and medium term. These include eliminating coal from its energy mix, increasing funding for energy efficiency, encouraging substitution of ethanol into gasoline blends, developing wind and geo-thermal power, introducing low-impact hydro, and undertaking research on hydrogen fuel use in buses and automobiles. Manitoba is the bus manufacturing capital of North America and sees fuel-cell buses as a key part of its economic future.

Just as interesting is Manitoba's decision—in collaboration with the provinces of **Ontario** and **Saskatchewan**—to begin assessing the development of a national clean energy grid in Canada that would depend on wind and low-impact hydro and would displace dirty coal elsewhere in the country. The three provinces plan to begin assessing how best to construct the necessary transmission lines to carry this renewable energy across the country. Through these actions, Manitoba believes it can generate thousands of new jobs and also be a zero-net-emissions economy in 12 to 15 years.

5 Municipal Initiatives

Hundreds of cities, towns and counties around the world are taking part in efforts to reduce greenhouse gas emissions. Together these municipalities are utilizing hundreds of different strategies, and the lessons they are learning are a critical source of practical information for others.

To help **cities in Canada** develop plans and measures for lowering emissions, the federal government and a nongovernmental organization called the International Council for Local Environmental Initiatives (ICLEI) initiated a Cities for Climate Protection program that helps municipalities through a five-step process of emissions reductions.

To support this work, the Canadian federal government created a two-tiered financing fund totaling C\$250 million that is administered by the Federation of Canadian Municipalities (FCM). FCM has \$50 million set aside for grants to help municipalities develop feasibility studies for reducing GHG emissions. Cities typically match these contributions one-for-one. The remaining \$200 million is in a revolving loan fund that cities can tap for energy-efficiency projects identified in feasibility studies. More than a 250 loans and grants have been made so far, with payback rates varying from three to ten years. Loans are repaid with savings from energy efficiency measures. Over time, cities then can use accumulated savings for other purposes.

A total of **107 Canadian cities and counties**, representing half of the country's population, have announced their determination to reduce GHG emissions. Some of Canada's largest and best known cities, including **Ottawa, Calgary** and **Edmonton** are successfully using the financing mechanisms made available by the Federation of Canadian Municipalities to reduce their energy use, lower GHG emissions, and save money on their electricity bills. **Toronto**, which was the first city in the world to take on a GHG reductions **commitment—20 percent below 1990 levels**—has saved C\$23 million since 1993 from energy-efficiency improvements financed through its Toronto Atmosphere Fund, which the city created for its own use.² Toronto also generates C\$1.5 million in revenue annually from the sale of electricity generated from methane gas that is captured at three city landfills.

In **Australia**, 171 municipalities with two-third's of the country's population are participating in a Cities for Climate Change program that was also begun with the assistance of ICLEI, the same organization helping Canadian cities. Municipalities here are also working their way through the same five-step process that Canadian cities use, but at a pace that already has 33 municipalities at the most advanced levels of activity. This is the fastest pace of any group of cities in the world. The 2002 progress report cited 780 actions by local councils. Building retrofits, streetlight efficiency, vehicle efficiency, methane capture, and green power purchases were the leading abatement measures. A key driver for this progress is the Australian government's Greenhouse Office, which funds a national ICLEI office and contributes funds for projects. Local governments have more than matched national contributions, at better than a 3 to 1 rate. Summaries of projects undertaken to date indicate that Australian

² Toronto's Atmosphere Fund was the model for the larger \$250 million fund later created by the Canadian federal government.

cities are not only increasing their emissions abatement but are also using these programs to generate jobs and local investment.

Many Australian provinces are impressed by what is happening at the municipal level. **Victoria, New South Wales, and South Australia** have all called on the federal government to ratify Kyoto, and have each developed provincial GHG reduction strategies. Victoria's strategy includes more than 50 measures that are expected to deliver emissions savings totaling 7.5 percent by 2010. Together, these provinces recently published a report showing that Australia would benefit financially by reducing emissions.

In **Europe**, the first ICLEI cities network now includes 135 municipalities. Given their earlier start date, it isn't surprising that more European cities have achieved their initial reduction targets. Each of these cities reports it is benefiting from cost savings associated with energy efficiency measures implemented to reduce GHG emissions. One example is **Heidelberg, Germany**, where since 1993 city planners have methodically reduced energy use in city facilities. Today, the city's energy use for heating is down 28 percent and its GHG emissions have been reduced by 36 percent. For its efforts, the city saves \$1.5 million annually on its fuel bill.

Conference of the Reducer participants were also pleased to hear a great deal of positive news emanating from the **United States**, despite the resistance by the federal government to taking action.

At the **U.S. city and county level**, 141 municipalities have joined the fast-growing ICLEI Cities for Climate Protection program (two years ago only 80 municipalities were participating). Cities can already count ten million tons of CO₂ emissions reduced in the United States at the municipal level, with many times that in additional commitments. Cities doing this work are also able to count more than \$90 million in savings from efficiency measures. The four most successful reductions strategies being implemented to date by U.S. cities are: retrofitting municipal buildings; switching to more efficient public lighting systems; capturing and using landfill methane gas; and improving recycling programs and thereby avoiding additional landfill based methane emissions.

Portland, Oregon was the first U.S. city to adopt a greenhouse gas reductions strategy. Portland's efforts have led to a 65 percent increase in public transit use, a recycling rate approaching 60 percent, and a strong public-private partnership to improve energy efficiency in apartments and commercial buildings. Officials in Portland estimate that energy-efficiency programs have saved city businesses and residents more than \$200 million since 1990. A national network of Cities for Climate Protection in the U.S. is now helping to share practical information across jurisdictional boundaries within the U.S. ICLEI also helps share this information internationally where feasible.

6 U.S. States Promote Emissions Reduction

U.S. states are also very active on emissions reductions. **California**, by itself the world's fifth largest economy, has adopted a string of policies that make up the most comprehensive U.S. government response to climate change to date. Among its many actions, California has

decided to regulate carbon emissions from vehicles; mandate that the amount of energy generated from renewable sources equal 20 percent of total state electricity sales by 2010; improve building codes; adopt energy-efficiency standards for 11 appliances; increase state funding for energy efficiency; and establish a tax credit for solar and wind power systems. California also recently set up the country's first registry for GHG emissions, developed reporting protocols for participating companies, and contracted with independent firms to certify emissions data. In addition, California administers the largest state-funded energy research program and has an active program to export clean energy technologies to foreign markets. According to the WorldWatch Institute, California estimates its commitment to renewable energy will bring in \$11 billion in benefits over a five year period from job creation and other in-state investment.

On the other side of the country, six **New England** governors committed in 2001 to reduce greenhouse gas emissions by between 75 and 85 percent over the long term. In the near term, governors agreed to return emissions to 1990 levels by 2010 and, by 2020, to seek a 10 percent reduction below that level. The governors are now working diligently both together and individually to enact more detailed plans.

Massachusetts, for instance, has adopted the nation's first law regulating carbon emissions from power plants. It has also committed to buying 15 percent of its energy from renewable sources by 2020; created a Clean Energy Fund to encourage energy efficiency and renewable-energy project development; and instituted a CO₂ offset program for new utilities. Under Massachusetts' new governor, Mitt Romney, the state is currently developing an even more ambitious plan that will include a state reductions target; a substantial renewables purchase commitment for state facilities; a Smart Growth program; a plan for greening state vehicle fleets; improvements in building codes; and a requirement that all new building projects disclose the CO₂ emissions they will generate.

In **Connecticut**, Governor Rowland, who co-chaired the August 2001 meeting of New England Governors and Eastern Canadian Premiers calling for long-term GHG reductions of between 75 and 85 percent, has established a steering committee comprised of commissioners from several agencies and tasked them with completing a comprehensive state-reductions plan by the fall of 2003. Connecticut is currently recognized as "The Fuel Cell State". The state expects that fuel-cell technology will play a critical role reducing greenhouse gas emissions in both the transportation and electricity sectors, and hopes they will be an engine for Connecticut's economy. Elsewhere in the region, **Maine** just became the first U.S. state to legislate its state-wide emissions reductions targets which call for reducing emissions to 1990 levels by 2010 and to 10 percent below 1990 levels by 2020; **New Hampshire** has mandated reductions in carbon emissions from power plants; **Rhode Island** has developed a state action plan; and **Vermont** has issued an executive order to reduce emissions.

Just South of New England, **New Jersey** became the first U.S. state to develop a state GHG reduction plan. In 1998, it committed to reduce emissions by 3.5 percent by 2005. To achieve this goal, state power companies committed themselves to reducing CO₂ emissions by 15 percent per kilowatt hour and increasing green energy generation to 3 percent by 2008 (increasing to 6.5 percent by 2012). In June, New Jersey's Governor James McGreevey agreed to purchase 20 percent of the state's electricity from green energy producers by 2020. In addition, New Jersey established a smart growth policy to reduce sprawl; set up a

fund totaling \$90 million a year for energy efficiency programs; and signed covenants with municipalities, universities and faith institutions committing participants to the state's reductions goal. In a sign that the state's intellectual resources are becoming engaged, all 56 of its universities and colleges signed the covenant. While currently on track to meet its commitment, New Jersey is now looking to reduce emissions further with a special emphasis on its transportation infrastructure and on green building.

In **New York**, Governor George Pataki has announced a state emissions-reductions target of 5 percent below 1990 levels by the year 2010 and 10 percent below 1990 levels by the year 2020. The governor also announced his intention to have 25 percent of the state's electricity generated from renewables by 2012, and to adopt California's tailpipe CO₂ standard. A series of tax credits and incentive programs are also part of the package. In a sign of Governor Pataki's willingness to take a leadership position on climate, he has invited all ten governors from Maine to Maryland to join him in a discussion on the establishment of a regional cap and trade program for greenhouse gas emissions from the power sector.

Pennsylvania has also taken several notable actions, including making a commitment to purchase 20 percent of the state government's energy from renewable sources; creating a cooperative program by 32 Pennsylvania colleges to substitute wind power for a portion of their electrical needs³; committing to build green state office buildings; developing an electrical choice program that allows Pennsylvanians to purchase green energy from power companies (150,000 households have made the switch); and providing grants to individuals who buy low-emission vehicles.

Meeting participants also heard about other related developments in the U.S., including the creation of **14 clean energy funds** that expect to have more than \$3 billion in assets to underwrite the transition to a clean energy future. Twelve of these states, including New York, California, Connecticut, and Massachusetts, have created the Clean Energy States Alliance or CESA, which aims to build a more robust domestic clean-energy market. These states are developing joint strategies to accelerate commercialization of clean energy technologies like solar, wind, fuel cells, and they are actively soliciting private U.S. investment funds as partners. Through this new alliance, incorporated as a separate nonprofit organization, the state funds are also reaching out to private and public funds in Canada and Europe to facilitate transatlantic opportunities to develop the renewable energy market.

Another important cross-cutting development is the decision by more than 40 U.S. states to implement **net metering rules**, which allow excess energy generated at home by solar, wind, fuel cell or other means to be returned to the energy grid for use elsewhere. The economic returns to household energy generators from running their electric meter backwards during off-peak hours helps pay down the cost of investments in household renewables systems, making installation more affordable.

³ A recent collaborative purchase decision by these universities was the largest single order for wind power yet in the United States.

7 Key Observations

Four key themes emerge from these private and public-sector success stories:

- **It is practical to reduce greenhouse gas emissions in a wide array of contexts using a variety of strategies.** Even without the completion of an international treaty, many companies and governments have decided to begin reducing emissions, and their efforts are meeting with success.
- **Emissions reductions programs are cost effective and often profitable; the long term benefits are also seen as substantial in many instances.** Companies and cities, in particular, appear to be able to document direct cost savings from their energy-efficiency programs. Some states and provinces, like Connecticut and Manitoba, predict economic benefits to their jurisdictions from pursuing renewable energy-based economic development strategies. At a national level, Germany anticipates becoming more competitive economically as a result of its ambitious GHG reductions programs. And in the U.K., an examination of the expense side of the ledger appears to show that costs of long-term reductions strategies are likely to be very small. The U.K.'s analysis did not attempt to tote up the benefits of making these reductions, but U.K. policymakers believe strongly that the benefits in the end will substantially outweigh the modest costs of action.
- **These success stories need to be widely shared.** Reducers themselves can gain from the experiences of their peers doing this work, while others who hope to begin reducing can learn from leaders in the field. Yet no forum currently exists for reducers to share their experiences. When the international community comes together to discuss climate change, it is in the context of the Kyoto Treaty negotiations. While critically important, these still-incomplete treaty negotiations have not facilitated much-needed "how-to" conversations about achieving GHG reductions. Participants at the May reducers meeting felt that reductions could be accelerated by creating mechanisms for sharing practical experiences. Broadcasting positive success stories, they felt, could offer greater confidence to policymakers with respect to the practicality of reducing emissions cost effectively. Increased confidence could also serve to accelerate international treaty negotiations.
- **Emissions reductions are faster and deeper when policy measures are linked to financing.** Canada uses linked grant and loan funds for feasibility studies and energy-efficiency projects. This has encouraged an array of municipal actions to reduce GHG emissions. Germany has developed a government-backed CO₂ loan available from local savings banks for household retrofits. As a complement to this, Heidelberg created a city agency that does energy efficiency assessments for homeowners and small businesses. With assessment results in hand, residents and businesses in Heidelberg can go to the local savings bank and get a CO₂ loan. This two-fold mechanism of an assessment and a financing tool makes it simple for interested homeowners and businesses to make the investments necessary to make deep cuts in energy use, while simultaneously reducing expenses. Without these tools, though, few have the expertise to identify cost-effective reduction strategies or the willingness to take the financial risk. The U.S. and Europe could do a great deal to facilitate state and municipal reductions if they would establish such grant and loan funds. This is also true worldwide.

8 Conclusion

It appears that the world is turning a corner on climate change. Though international discussions about a multilateral climate treaty remain incomplete, a critical mass of greenhouse gas reducers has moved forward in a variety of different governmental, corporate, and civic settings. Their actions are demonstrating that steep GHG reductions can be achieved in practical and cost-effective ways. Given this wealth of emerging experience, this information must be shared more broadly. Doing so could accelerate emissions reductions worldwide.