January 2002

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RECONCILING ENERGY AND ENVIRONMENTAL POLICY

F. Michael Cleland

Thank you very much, David, for your kind introduction. Although I am not, in fact, an economist, I have a political science background and, therefore, I think I can claim some authority to talk about the political economy of energy and environment. As it turns out, this presentation will recap much of what we heard yesterday; that was an accident, but perhaps a fortunate one, given that I am last speaker on the program. What I will talk about today is the energy-environment issue through the perspective of energy.

The framework I will use is implicitly applicable to both Canada and the U.S. We share the economic, environmental and energy space that we call the northern half of North America. Much of the framework would probably extend to Mexico, but we do not have quite the same degree of institutional harmonization or similarity as we do between Canada and the U.S. Our economies are deeply intertwined in energy, as well as with everything else and although our energy economies are somewhat different and complementary in several respects, for the most part, they share many key similarities.

CONTINUING TRENDS IN ENERGY CONSUMPTION

Allow me to say a couple of things here that are probably self-evident to most people in this room. Several people have mentioned, and I fully agree, that economic growth can indeed be reconciled with environmental improvement. I also think most people would agree that well-functioning markets are consistent with the goal of improving the environment. Perhaps less self-evident, certainly in practice, is the need to look at the essential characteristics of the energy system as a whole, to think how they are intertwined, and to use that knowledge as a basis for deriving a more effective environmental policy. I would argue that if you do not do that, you will increase the degree of disharmony and arguably slow down the process of environmental improvement.

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I have built my argument around several "snapshots" of key factors. There are likely several that I have missed. For example, yesterday, Professor Hickey mentioned a few very important international jurisdictional issues, as well as the notion of the "full cycle" of the energy system. One might usefully build these ideas into the set of snapshots.

Continuing, however, let me touch on what is perhaps another self-evident proposition. From time to time, people talk about the decoupling of economic and energy use growth. However, as Mark Twain might have said, the reports of that are greatly exaggerated; it may happen but it has not happened yet and we are going to continue to need more energy for many years to come.

**Figure 1. World Energy Consumption and GDP, 1970-2000**

![World Energy Consumption and Gross Domestic Product, 1970 to 2000](image)

*Source: 2002 International Energy Outlook Database, United States Energy Information Administration*

On the other hand, Figure 1 (which encompasses the global economy) shows that, for about the last ten years, some divergence of those otherwise parallel paths being driven primarily by what is happening in the OECD and probably the former Soviet Union. This divergence is not yet being driven by what is happening in the less-developed world, but still there has been some divergence. In other words, the energy intensity of the economy in the world is declining; that certainly is good news. The bad news is that it is not declining anywhere near fast enough to meet the requirements of the Kyoto Protocol.

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2. See Kyoto Protocol to the United Nations Framework Convention on Climate Change,
For a decade or more, the environmental community has been pointing out to us that we do not necessarily need oil or gas or any particular energy commodity. However, you do need a way to get to work in the morning, a warm house, and the lights on when you come home. Therefore, there are many opportunities for substitution. You do not need the commodity; you need what comes out at the end of the pipe. That is the good news. The bad news is that there are some constraints on the substitutability of different energy forms, commodities and technologies, depending on the service you are actually trying to perform. David Jhirad put his finger on one of the most challenging aspects yesterday when he talked about the problem of powering mobility. Motor fuels have some unique characteristics: essentially, power density and portability. Unless you can meet those needs, you are not going to find an environmentally-acceptable substitute for dealing with mobility issues. The technologies are probably out there, but these problems create particular challenges.

More bad news: the market is not helping us in terms of convincing people to reduce their energy use. Most of us, when we see upward perturbations in the price, tend to notice it briefly and get quite excited about it. We may, very briefly, even reduce our energy use, as we have seen in California for the last couple years. However, for the most part, we do not see the price of the energy we use, and are thus not provided with a very strong spur to increasing energy efficiency. That is not true of the industrial sector, where energy is a relatively large part of production costs but it is true for much of personal energy end use.

That said, as you can see in Figure 2 there is in Canada a well-established trend of declining energy intensity in the economy. It is very much the same picture in the United States. The line that starts down sooner is overall energy usage; the other one is electricity. It is still not clear exactly where those lines are going to go, but it appears that the two tendencies are reasonably well entrained, and I think we will see their continuation. The question is, particularly in the context of something like Kyoto, whether they can be driven downward much more quickly. I would argue that the answer is no, and I think that is one of the things you must take into account when you ask yourself whether the speed of reductions implied in Kyoto is a realistic objective.


4 See, e.g., Jerry Hirsch, Lessons From the Energy Frontlines Utilities: Consumers Adapted and Cut Demand, L.A. TIMES, Oct. 28, 2001, at C1, available at 2001 WL 28924082 ("Nearly half of the residential customers of the state's two largest utilities spent less on electricity in August than in the same month a year earlier.").
Figure 2.

Canadian Energy and Electricity Final Demand per GDP, 1975 to 1999


Figure 3 shows the fuels mix in the economy going back to the about the 1870s (again, it is Canada I am looking at here, but I believe that the picture in the US would be similar). Some interesting conclusions can be drawn from it. One of things that is fascinating to me was how much wood dominated the picture until the end of the 19th Century, then coal and oil.

Figure 3. Canadian Energy Demand by Primary Source, 1871-1997
More recently, in the last 20 years, we have what we call a multi-fuel economy or a multi-fuel and technology economy – a much more diversified fuel and technology mix than we ever had prior to the 1980s. In all probability, we will see that going forward and, for a variety of policy reasons, that is a good thing. We have more choices – perhaps not more choices at any given point in time (because you are hooked up to only one source) – but more choices in terms of the evolution of technology.

**Figure 4. Catch the Technological Wave!**

Turning to technology, Figure 4 is taken from *The Economist* from an article dealing with the process of technological change. Still, this chart shows us some very interesting things. If you go back 150 or so years or so,
many of the transformative technologies were energy technologies—water power, steam, and then electricity at the beginning of the last century, and then the internal combustion engine. These technologies were transformative in the sense that society was fundamentally transformed by their emergence. Most observers would argue that we are not going to see another leap in transformative energy technologies for a while, but, rather, incremental changes, such as with fuel cells, wind power and photovoltaics or secondary effects based on other technologies such as information technology. Perhaps the most important point illustrated here is that truly transformative technological change comes in waves and that it emerges over periods of several decades.

In other words, the fundamental transformation implied by the climate change issue is something that will likely require several decades to bring about. The International Energy Agency has done some interesting work with respect to, for example, photovoltaics or biofuels, but the horizons for those energy sources are still two and three decades out before they become integrated in the marketplace.

ENERGY AND ENVIRONMENTAL POLICY: OBJECTIVES AND CHALLENGES

Several core objectives—security and reliability, economic development, environment and health—underlie energy policy. For the last ten years, the focus in energy policy has been principally driven by considerations of the environment and sustainable development. However, while the comparative weight of each of the many objectives of energy policy changes with the times, each one of them needs to be taken into account at all times.

Since the 1980s, we have discovered that most of these policy goals can be realized by well-functioning private markets. However, markets, in and of themselves, cannot adequately capture environmental externalities. Nonetheless, the marketplace largely serves our needs for economic development for affordable, reliable and secure energy. With that in mind, we can turn to some of the challenges confronting energy policy and the search for environmental sustainability.

Energy Market Restructuring: Some Considerations

Several challenges remain as we complete the move to a market framework. David Drinkwater and David Manning both made those points.

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eloquently when they talked about the respective situations in Ontario and New York.\textsuperscript{6}

Energy is not like any other commodity; people perceive it very differently. It is still widely viewed as a public service, even though most energy services are now provided by private-sector businesses working in deregulated markets. As with health care (in Canada at least), most of the public view energy as a right, and they react very strongly in the political arena when they see that their “right” is being compromised by shortages, perceived unfairness or (most especially) upward price perturbations (they never notice downward price movements). Even well functioning energy markets will have an inherent tendency to turbulence since the high natural sensitivity of energy to the economic cycle combined with the very long lead times for new production and technological change produces volatile short-term price behaviour. Although there are ways to mitigate these effects, there is still a long way to go, particularly with electricity, before we have people reasonably comfortable with the idea of a market framework.

We also must consider the fact that energy systems rest on complex physical networks which leaves at least part of the system with the characteristics of a natural monopoly and therefore entails some limitation on the effectiveness of competitive markets. The dependency on an extensive infrastructure has other effects as well. Infrastructure-in-place will have a large impact in determining options several decades from the time that infrastructure was created. This reality is often at the root of any local-versus-societal rights conflict; after all, the power line or the pipeline running over your land is serving somebody else. As long as our energy systems rest on physical infrastructure, we must consider this characteristic as we think about balancing local versus societal effects and about timeframes for implementing changes in the system.

As governments grapple with the questions of how they should proceed with market restructuring, electricity creates special challenges. Electricity is in a period of high turbulence as a consequence of its unique physical attributes, its dependence on infrastructure, and its nature as an essential underpinning to modern life all of which contributes to the lack of societal consensus on the appropriate role of government. All of this is backdrop to which we ignore at our peril as we think about managing related environmental issues.

Globalization of Energy Markets

From very local beginnings, energy markets are now operating on a very large geographic scale. Oil and coal work in global markets, while gas works largely in continental markets. Refined petroleum products work in very large regional markets, and electricity increasingly works in very large (close to continental-scale) regional markets.

The trend toward globalization of energy markets certainly affects the way one must think about jurisdictional relationships. For many countries, however, energy is still a matter of national security. While energy policy continues to be seen in most countries as an underpinning to national security, some other nations take it more for granted than as a highly salient policy concern. In the U.S., especially, given recent events, energy security is a mainstream political issue. I believe that the U.S. will continue to be preoccupied with finding local or national sources of energy, and in the U.S., one of these is coal. Coal is going to be us for a long time, if for no other reason than it is domestically available and low cost. Security will often trump other issues and if environmental goals are not to be simply pushed aside they need to be considered with the security imperative in mind.

The Environment

In the realm of energy production, the dominant public policy issue over the past decade has been in respect to the environment. It is a complex story; it is not just about Kyoto or about other air emissions, but also about the effects of many different production technologies and fuels. Energy production and use has an inherently large environmental footprint, causing land, water or habitat disturbance, air emissions, visual and other aesthetic impacts, and real and perceived public health effects. Some of the latter of these may be misplaced but they are political realities. These concerns tend to produce a very complex mix of trade offs not only between environment and economy but also among environmental effects and between local and societal requirements. Is this all a bad news story? I do not think so. I think the evidence for the last several decades have been positive, notwithstanding David Jhirad’s comments yesterday that suggested that, on a world scale, we have a rather large problem to deal with.7 I would say, in the North American context, we have done reasonably well; we need to do better and do more, but, so far, I think it has been working for us.

What are some ideas for how we can go forward? The point was made yesterday and I think I have reinforced it, that one needs to keep an eye on

7 Jhirad, supra note 3, at 316-320.
the other policy objectives. They cannot be compartmentalised; if you talk only about energy and environment, without thinking about economic development or the affordability of energy, or security, you will get the mix wrong. Environmental policy that runs hard up against economic or national security objectives will generate intense political conflict and the environment will (likely) lose. I believe, however, they can be made to work together.

SOME LONG TERM SOLUTIONS

One thing we can do to avoid this problem is to keep an eye on the long-term trends. I believe that wishful thinking that is contrary to those trends is likely to founder because it will overstate the practical scope for energy efficiency improvement, the limited potential for emerging technologies to eliminate impacts, and the practicality of rapid technology take-up and capital stock turnover. Many would say that is backward thinking; they would argue that you can make leaps and disconnects. Indeed, external shocks can create disconnects, as we saw in 1973 and 1979. Sometimes, you get technology disconnects, but I would not count on them. I would, instead, count on a slow, steady push for improving energy efficiency, moving new technologies into the marketplace, and turning over capital stock in an efficient and expeditious way, as opposed to, for example, taking out a lot of perfectly good capital stock to achieve short-term results.

We must also find ways to deal with the local-versus-global-effects issue. Most everyone in the environmental community likes the idea of interminable siting processes right up until the process affects projects that are perceived as environmentally positive. I was at a conference a couple of years ago on wind energy. We had very good discussions on the NIMBY mindset as it affects wind projects. Someone at that conference suggested that, perhaps, we need wind-friendly siting processes. I suggested in turn that what we really need are friendly siting processes for all technologies, and the silence in the room was deafening. I think the rule of law should apply to everyone, and we should be looking at getting more stable and predictable siting processes that are able to deal with the complex issue of local rights versus societal rights. That should be obvious, but if you ever want to talk about the political economy of energy and environment, this is it.

We need to be realistic about what consumers will or will not accept. In North America at least, consumers are not keen on governments levying tax increases as a way to make them absorb a larger part of the environmental externality that they help create. We can make greater efforts to educate the

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public on the need to share some of the burden of achieving environmental protection but this will take time and effort. In the meantime, I think it is naïve to believe that, in the near term at least, we can shove those costs down consumer’s throats. They will shove them right back on the politicians, and the politicians know it.

We need to avoid policy shocks. If you try to force inflections in underlying trends, you will likely get all sorts of unintended effects, including increasing the tendency for market volatility and impairing the movement to competitive markets. You could also end up with some perverse environmental outcomes that you will need to fix later. In any event, they probably will not work.

Finally, just to wrap it up, we should avoid short-term policy shifts to the extent we can. Energy, including the new and desirable energy technologies for the future, requires a more stable and predictable investment environment. I would argue that public policy should create a more, rather than less, stable environment to reduce rather than exacerbate risks. Environment issues are long-term problems requiring long-term solutions. We need to create the policy conditions needed to induce action now, but we should not be fooled into thinking we are going to get the results in the near term, as most of the results of our efforts will arrive in a time horizon that is decades in the future.

Thank you very much.