

BECOMING INCREASINGLY UNCONVENTIONAL: WHY ENERGY IS IN NEED OF A STRATEGY

Kevin G. Lynch and Kathy Sendall

The global energy picture is shifting. World energy demand is expected to increase by one-third between 2010 and 2035, with the vast majority of the demand driven by the rapidly emerging economies. China alone is forecast to consume 70 percent more energy than the US by 2035. Incremental supply will remain predominantly from hydrocarbons, but will increasingly come from unconventional sources and geographies. Canada should benefit from this, Kevin Lynch and Kathy Sendall argue, provided it pays greater attention to where the shifts in energy demand will come from and how the demand will be met. Unconventional oil and gas development depends on new and innovative technologies and, to supply the new energy, consumers in Asia will require new transportation infrastructure. All require leadership and a strategic game plan.

À l'échelle mondiale, le secteur de l'énergie est en pleine mutation. On prévoit que la demande augmentera du tiers d'ici à 2035, essentiellement sous l'effet de la croissance des économies émergentes. À elle seule, la consommation chinoise devrait à cette date dépasser de 70 p. 100 celle des États-Unis. Cette énergie supplémentaire continuera de provenir majoritairement des hydrocarbures, mais puisera aussi à des sources et des régions nouvelles. Une évolution dont le Canada pourra profiter, soutiennent Kevin Lynch et Kathy Sendall, à condition de prêter plus d'attention au déplacement des points de demande et aux moyens d'y répondre. Le développement de gaz et de pétrole non conventionnels sera tributaire de technologies innovantes, et l'approvisionnement des nouveaux consommateurs d'Asie nécessitera de nouvelles infrastructures de transport. Mais plus encore, il faudra un leadership fort et un véritable plan stratégique.



It would be rather understandable for a neutral observer of global energy developments in 2011 to sympathize with John Cleese, of Monty Python fame, as he gasps “It’s not the despair Laura, I can stand the despair; it’s the hope...”

Consider the contrasts in how the year evolved. A year with another purportedly make-or-break global conference on climate change, and unabated rises in global CO₂ emissions. A year of strong public support for environmentalism and conservation, and publics rewarding political parties that promised lower energy prices. A year of increasing supply from unconventional energy sources, and growing vocal resistance to these new technologies and sources. A year of continuing US concern about national security writ large, and the unwillingness of the US to sanction a new Canadian oil pipeline that would provide secure and market-based energy to the American heartland. A year of structural shifts in global growth and economic power toward energy-challenged Asia, and an apparent Canadian aversion to developing a strategic

perspective on how to maximize the longer-term benefits of our energy resources in the face of such seismic shifts. In short, a year that should inform how and why we can do better.

Let’s start with the 2012 global context for energy. On the economic front, we are facing a long, slow and slobby recovery in OECD countries, whereas there is much more robust economic performance in the dynamic emerging economies. In this two-speed world, some 80 percent of total world growth this year will come from outside the OECD, and about half of that will be generated by China alone, with a further 25 percent from economies closely linked to China (Hong Kong, Singapore, Taiwan, Thailand, etc.).

Geopolitically, the initial exhilaration of the Arab Spring has given way to the reality of ongoing turmoil and uncertainty about the behaviour of future regimes in this oil and gas rich part of the world. Indeed, much of the incremental conventional oil and gas supply is in countries with either challenging security or political situations, or state-directed

energy companies or in unconventional geographies such as deep-water offshore regions and the Arctic. Further, post-Fukushima, the nuclear energy sector is facing renewed uncertainty.

According to the International Energy Agency's (IEA) *World Energy*

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Outlook for 2011, despite the short-term impacts on energy demand resulting from the economic weakness in many OECD countries, little has been done "to quench the world's increasing thirst for energy in the long term" (figure 1). The IEA still expects world energy demand to increase by one-third between 2010 and 2035, on a current policies basis, and projects energy-related CO₂ emissions to increase by 20 percent over this same period. With today's technologies, it is an inescapable truth that economic growth, energy consumption and greenhouse gas (GHG) emissions are inextricably linked.

So what is driving this energy demand growth? Simply put, it is the emerging economies. As indicated in figure 1, over 90 percent of the projected growth in world energy demand comes from non-OECD countries, with China alone accounting for more than 30 percent of the projected growth between now and 2035. To put the implications of this growth in perspective, China is forecast to consume 70 percent more energy by 2035 than the US on an absolute basis, although American per capita energy use will still be higher.

What energy source is meeting this energy demand (figure 2)? Yes, Dorothy, it will still be a hydrocarbon energy world in 2035, with oil, gas and coal supplying about three-quarters of global energy needs. Oil demand increases are largely transportation driven, particularly in the non-OECD economies (figure 3). Coal demand increases are develop-

ing-economy driven. Natural gas increases are driven by both demand and supply shifts, and gas, both conventional and unconventional, will significantly increase its share over this period.

A key consideration for the global energy outlook is the growing impor-

tance of unconventional gas and oil for the global energy supply equation. Two questions with respect to the energy outlook that have yet to be addressed are the pace and scale of nuclear power expansion, particularly if political concerns solidify, and the willingness to invest massively in new energy supply capacity in the Middle East, particularly if regime uncertainty is prolonged. Both may place upward pressure on energy prices. Finally, in this changing energy dynamic, as figure 4 demonstrates, the Russians are coming.

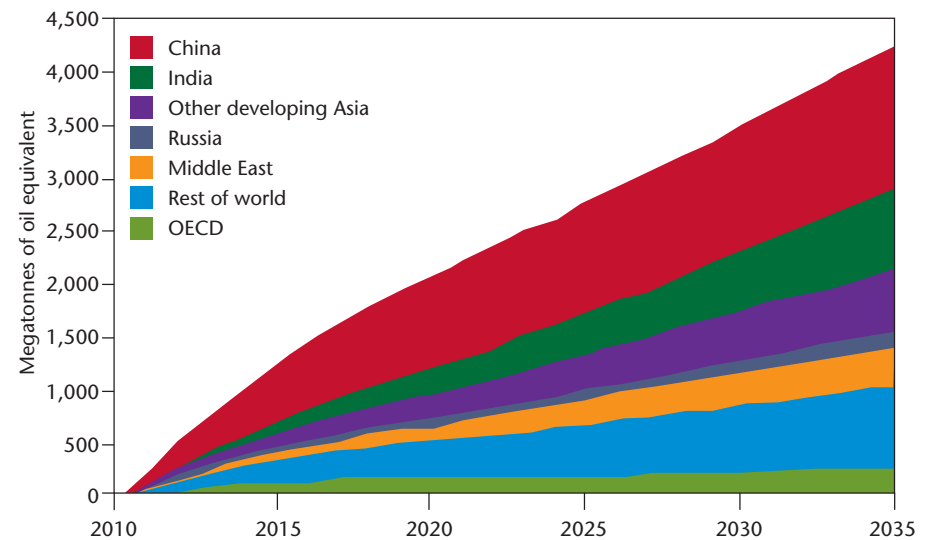
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the projected growth in energy demand, which is not a new phenomenon, there will also be the need for enormous new energy transportation infrastructure to reach and serve the new global energy consumers. Indeed, reflecting the profound shift in global economic gravity, the dynamics of world energy markets will be more and more determined by the rapidly emerging non-OECD economies, with more and more inter-regional energy trade than has been the norm for decades.

What does this changing global picture mean for Canada? As the IEA analysis clearly demonstrates, and despite much hoopla to the contrary, hydrocarbons will remain key energy sources for the foreseeable future and this benefits a hydrocarbon abundant country such as Canada.

But we need to pay greater attention to the shifts in where the future energy demand will come from and how the demand will be met. Today's energy demand growth is not being driven by our traditional markets in the US, but by the sheer size and rapid growth of the new energy consumers of tomorrow —

FIGURE 1. PROJECTION OF GROWTH IN WORLD ENERGY DEMAND, BY REGION, 2010-35



Source: International Energy Agency, *World Energy Outlook*, 2011.

in the Asia Pacific region. And incremental supply to meet these demands will increasingly come from unconventional oil and gas sources and from more complex environments and geographies.

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This puts a premium on technological innovation to improve the efficiency of oil and gas recovery from oil sands, shale and other unconventional sources, at lower costs and with reduced environmental impacts. And all of this is predicated on having the necessary energy transportation infrastructure — growing energy demand is meaningful only if you can get your energy to those markets efficiently and effectively.

Further, it puts a premium on timing: many countries are already vying to meet the growing energy demands of the dynamic emerging economies. These emerging economies are racing to lock in secure energy supplies that are so critical to their continued economic growth in an uncertain global environment.

Again, what should all of this mean for Canadians? We believe it should cause us to pause and reflect on five seemingly simple propositions that appear to be much more challenging in practice.

First, why have we not diversified our trade relationships and investment links, in line with the profound shifting of the global marketplace? The world is changing. Its economic centre of gravity is shifting toward Asia, and political power will soon follow. Pervasive globalization and the Internet are connecting markets, capital, people and information to a previously unimaginable extent. Demographics and technology are redefining competitiveness, and the demographic dividend is in the developing economies. Asia is not emerging but re-emerging: in 1720 Asia

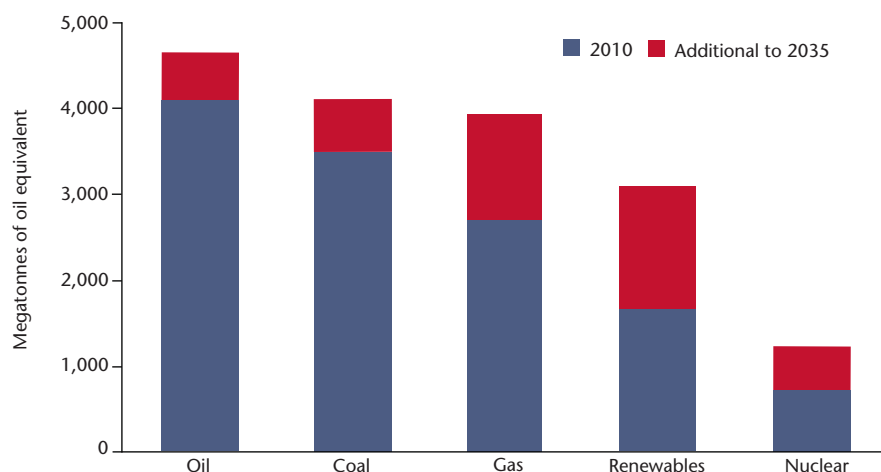
accounted for roughly 50 percent of world GDP, as it will again in 2020.

To date, two of Canada's great advantages have been geography — our proximity to the US and history —

our historical links to Europe. Neither can play the role in our future that they played in our past.

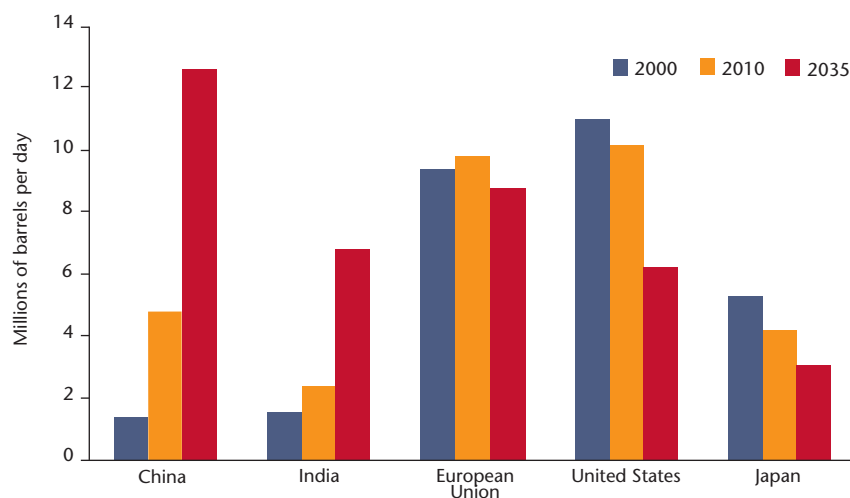
The market opportunities for Canadian companies are shifting, moving away from the mature Western economies and toward the dynamic emerging economies of Asia and elsewhere. And yet, 75 percent of Canadian exports go to the United States while just over 3 percent reach China and less than 1 percent each go to South Korea, India, Taiwan, Singapore, Indonesia, Brazil, South Africa and Russia, to name a few, all of which are growing at multiples of US and European growth. China, India and Brazil alone now account for 40 percent

FIGURE 2. PROJECTION OF SOURCES OF ENERGY SUPPLY TO MEET THE GROWTH IN WORLD ENERGY DEMAND, 2010-35



Source: International Energy Agency, *World Energy Outlook*, 2011.

FIGURE 3. PROJECTION OF WHO BUYS THE OIL, 2000-35



Source: International Energy Agency, *World Energy Outlook*, 2011.

of the world's population, with a middle class larger than the entire population of the North American Free Trade Agreement region.

As table 1 clearly indicates, Canada's trade markets are "over-weighted" in slower-growing economies, many with structural fiscal problems and demographic problems. Canada is a trading nation but not a nation of traders. We need to become a global trade leader not just a bilateral trade partner. This will require new and innovative trade and investment agreements with a select group of dynamic emerging economies that are complementary to our economic advantages. It will also require a more aggressive approach to global markets by Canadian business, large and small. For medium-size countries like Canada, prosperity, trade and investment go hand in hand.

Second, why do we have all our energy eggs in one basket, even if that basket is large, rich and close at hand? Canada is the largest energy supplier to the United States, including oil and gas, but there are a number of countries that compete to supply US energy needs. The United States is the dominant and, in practical terms, the only market for our oil and gas exports, both conventional and unconventional. Basic economics suggests that you seldom maximize the value of what you are selling when there is only one buyer for your products.

In this context, several things are worth reflecting upon. The recent US government rejection of the Keystone XL pipeline application highlights the importance to Canada, an energy exporter, of security of demand just as the US places great emphasis on security of supply. Without the certainty of additional pipeline capacity to move incremental unconventional oil supplies to the US marketplace, the expansion of these unconventional oil reserves becomes less certain, impacting the growth prospects of a key sector of the Canadian economy. Equally disconcerting was the sense that the factors influencing the US government decision appeared to give short shrift to

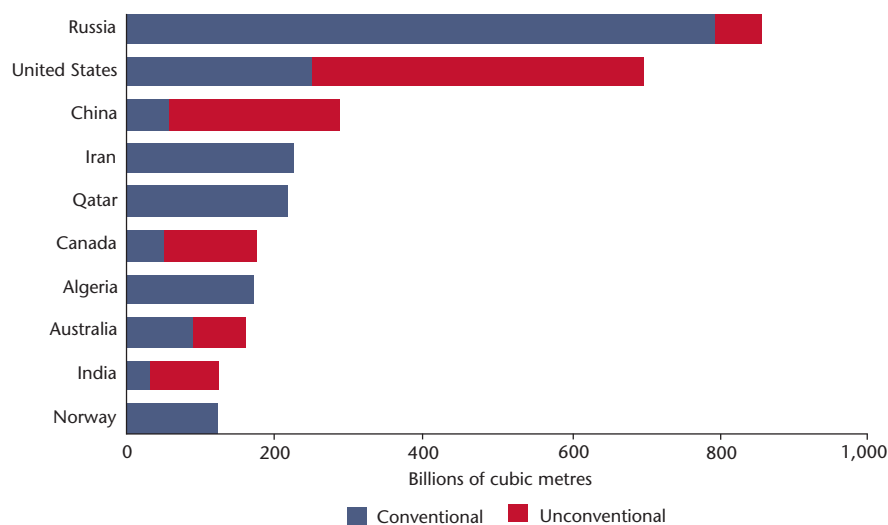
either the economics of the North American marketplace or the relative security of Canadian energy supplies compared to those from other suppliers such as the Middle East, Venezuela, Nigeria and many other suppliers to the US.

The second feature of our energy relations with the US is the "cost" to Canada of having a "single purchaser" of our oil and gas production. A recent path-breaking study by M.C. Moore et al. (2011) explains clearly why Canadian oil trades at a substantial discount to world benchmarks in US markets. These reasons include infrastructure bottlenecks in the US through which Canadian oil

moves (Cushing, Oklahoma), inadequate pipeline capacity to Gulf refineries without a Keystone-sized and routed pipeline, no access to US west coast refineries and the lack of access for Canadian oil to Asian markets.

The Moore et al. study models the impacts on the price discount if Canadian oil was able to reach the Gulf, the US west coast and Asia, an outcome that would require new pipelines to the Gulf and to the west coast of Canada. The results are quite dramatic. Over a 15-year period, in today's dollars, the impact of higher prices to Canadian producers (i.e., a lower discount) would be an additional \$132 billion in Canadian GDP.

FIGURE 4. SUPPLIERS OF GAS



Source: International Energy Agency, *World Energy Outlook*, 2011.

TABLE 1. CANADA'S TOP 10 IMPORT AND EXPORT MARKETS

Export Markets		Import Markets	
Country	Proportion of Canadian exports	Country	Proportion of Canadian imports
1. United States	74.9	1. United States	50.4
2. United Kingdom	4.1	2. China	11.0
3. China	3.3	3. Mexico	5.5
4. Japan	2.3	4. Japan	3.3
5. Mexico	1.3	5. Germany	2.8
6. Germany	1.0	6. United Kingdom	2.6
7. South Korea	0.9	7. South Korea	1.5
8. Netherlands	0.8	8. France	1.3
9. Brazil	0.6	9. Italy	1.2
10. Norway	0.6	10. Taiwan	1.0
Total	89.8	Total	80.6

Source: Industry Canada, 2010.

The IEA energy demand projection raises another aspect of our excessive reliance on the US oil market to which we should also pay attention. Figure 3 suggests there is a limit to growth in American oil consumption; in fact, it projects declining US oil imports well before 2035. This is a cautionary reminder that it is Asia where the growth in demand for oil is concentrated, not the US. Given the extent of our unconventional hydrocarbon reserves, Canada will need access to Asian markets if we are to develop fully our unconventional oil capacity.

Asia presents enormous potential for Canadian gas as well as oil. A recent study for the Pacific Economic Cooperation Council and the Asia Pacific Foundation, entitled “Prospects for Transpacific Energy Trade,” articulates the segmented nature of gas markets around the world. In effect, there is no global gas market; rather, there are a series of regional markets with very different prices. North American gas prices are dramatically lower than gas prices in Asia (China, Japan, South Korea and India) because of excess supply due to new US unconventional gas development and the absence of appropriate transportation systems to access key Asian markets. Linking the North American and Asian gas markets via the west coast of Canada would reduce these gas price differentials considerably, inclusive of the costs of building pipelines, liquefied natural gas facilities and shipping. The impact on Canadian GDP would again be significant.

However, timing is again critical. Asian countries such as Japan, South Korea and China want to lock in security of gas supply. Other countries, including the US, may be capable of supplying liquefied natural gas to these markets more quickly.

After the Keystone pipeline deferral by the US government, Prime Minister Stephen Harper made the crucial decision that Canada should put its energy eggs in several baskets. The

Prime Minister stated: “This does underscore the necessity of Canada making sure that we’re able to access Asian markets for our energy products, and that will be an important priority of the government going forward.” Having now decided the policy direction, the challenge will be its implementation. And here, the devil is in the details.

Third, why are we forsaking an abundant energy source? Daniel Yergin, in his new book *The Quest*, observed: “There is one key energy source that most people do not think of as an energy source. Sometimes it is called conservation; sometimes efficiency. It is hard to conceptualize and hard to mobilize and yet it can make the biggest contribution of all to the energy balance in the years immediately ahead.”

Despite the evidence pointing to the considerable gains to be had from energy efficiency, it surprisingly does not appear to be a high priority. Why do public policies to encourage energy efficiency seemingly take a back seat to public policies to spur alternative energy sources? Is the latter more effective — unlikely in the near-to-medium term, as

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efficiency gains can be realized quickly from energy demand and supply curves? Is the latter less expensive — again unlikely, as regulatory reform and market instruments can have a real bite on energy efficiency while alternative energy subsidies have to be scaled to offset uncertainty and long lead times?

An interesting case in point is the scope for energy efficiency savings through the greening of commercial buildings, with the renewal of the Empire State building as the poster child. In the US, where 5 percent of commercial buildings constitute 50 percent of all square footage, there is compelling analysis that a regulatory and market instrument focus on large buildings when they approach their

normal capital renewal cycle could yield large energy efficiency savings at minimal long-term cost.

The simplest way to encourage energy efficiency is not to circumvent the market but to employ it, through price signals, to efficiently influence energy choice. However, the stumbling block is too often the unwillingness of governments to increase the price of energy and the unwillingness of the public to accept such an increase. A good illustration was the recent Ontario election in which, despite a majority of Ontarians expressing concern about climate change and the environment, all political parties in the election campaign promised to lower the price of electricity, and the public validated this.

Fourth, why are we not desperately seeking a more strategic approach to Canada’s energy future? Canadian oil and gas producers operate in this incredibly interconnected world of global energy markets, with an assortment of private sector and state-owned energy players, a myriad of domestic and international environment regula-

tions and a raft of transformative technological innovations in the unconventional oil and gas area. It is complexity personified.

Although Canada’s energy sector is one of our core economic advantages — a source of wealth and jobs and growth and public revenue, there is no consistent and concerted game plan for its development. When the national interest for current and future generations is so evidently at stake, the need for clear strategies to confront the new reality, and shape it to our best advantage, seems rather evident.

A consistent voice for a Canadian energy strategy over a number of years has been Roger Gibbins of the Canada West Foundation. He argues that it

should have five core principles: security of demand, affordability, high environmental standards, a culture of innovation, and an inclusive engagement process to discuss, design, decide and do. The good news is that governments and business are finally warming to the need

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for a coherent approach to such an important sector. The better news would be that they were launching it.

Fifth, where is the leadership? Energy is the lifeblood of every economy and society around the world. But there are inevitable linkages and trade-offs among economic growth, energy use, environment stewardship and standard of living objectives. The challenge is to address these trade-offs, not be stymied by them, and do so in an inclusive, analytic and realistic manner with the clear goal of improving the long-term prospects of Canada and Canadians. The role for industry, governments, environmentalists, Aboriginal groups and citizens is to engage together to find those positive compromises, and this takes leadership.

But have the preconditions for such collaboration and progress changed, making it more difficult to achieve common ground for compromise and to mobilize for change? In this context, it is worthwhile reflecting on the following factors:

The decline in trust in leadership, including business, government, regulatory and others in many Western countries over recent years. This reflects a variety of factors and has made finding common ground and compromises harder to achieve. The positions of various interest groups are now viewed more skeptically by the public, and that same public has less clarity as to where to look for "trusted third parties." This creates the challenge of how to create sufficient "social licence" to lead, and to act.

The segmentation of engagement in issues. Interest groups are less likely to engage with each other in an open dialogue but compete with each other for media attention, using the new media to segment messages and audiences. The impact on the public, which has

the common sense to know there are usually many complex aspects to challenging questions, is often frustration — a feeling there is too much noise, too few undisputed facts and not enough true engagement.

The divergence of time frames, which makes the finding of common ground more fraught. Energy issues are a prime example: they are multi-year at best and more likely decennial whereas capital markets have a quarterly fixation with at best an annual outlook with firms feeling the inevitable pressure to follow suit (the curse of "quarterly capitalism" that McKinsey's Dominic Barton so eloquently bemoans) and politics is increasingly daily, campaigning seemingly perpetual, particularly in the US, and the news cycle risks becoming an instantaneous Twitter feed.

The problem of jurisdiction, where the interconnectedness of markets and issues is not matched by political and jurisdictional boundaries. Again energy and environment issues are a good example: they are local; they are provincial; they are national; they are international; they are intertwined. Who makes the trade-offs across different interest groups? How do you balance national sovereignty with transnational connections and consequences?

The simple answer is that leadership is more difficult for all the reasons cited. But it is also all the more imperative because of the risks and opportunities we face in such a key sector at such a pivotal period. And, at such piv-

otal moments in the past — whether it was the transcontinental rail system, the TransCanada highway system, the west-east oil and gas pipeline system or the Free Trade Agreement with the US, Canadians found imaginative ways to collaborate and take bold decisions that benefited future generations.

Our risk may be national complacency, and our riskiest choice may be the status quo. We have a strong dollar and weak productivity. We have deep trade linkages with the world's richest economy and weak trade linkages with the world's fastest-growing economies. We have abundant energy resources and an inability to convince an energy-challenged world we are a secure and sustainable energy supplier.

Strategy based clearly on our national interests is not always a Canadian trait, argues Ed Greenspon in a paper authored for the Canadian International Council. He observes: "Canadians display an unusual reticence to think in terms of national interests. We often seem to prefer the gauzy candescence of 'values discussions' to the hard reality of producing a more prosperous and secure future. Our interests and our values are not at odds. But we must not fall into the trap of confusing policies that merely allow us to feel good with those that actually do good. If we do not advance our interests aggressively, we will quickly lose our ability to promote our values."

To help strategically shape our future, we should look at energy with less of the John Cleese cynicism and more of the George Bernard Shaw optimism, often quoted by Bobby Kennedy: "You see things; and you say, 'Why?' But I dream things that never were; and I say 'Why not?'" That will require leadership, from all of us.

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