

Fueling a Cleaner Future

Balancing the need for more energy and a cleaner environment is our generation's prevailing challenge.

By taking a sensible, pragmatic approach, we can address both

RECENTLY, THE INTERNATIONAL ENERGY AGENCY ISSUED A FORECAST that projects the world's energy demand will be more than 50 percent higher in 2030 than it was in 2000. The next day, the results of a national survey showed that the environment is now a top issue for Canadians, second only to health care.

The sequence of these events reminded me of the close connection between energy and the environment. Together, they represent the fundamental issues of our times: How can we reconcile the increasing need for energy and the growing demand for environmental excellence? Canadians don't want to – and need not – choose between a cleaner, healthier environment and reliable, affordable energy. Both are important. That is why a sensible, pragmatic approach must be created that addresses both matters at the same time and delivers value to Canadians.

But where should we start? The first step is to identify the most critical environmental issues facing us. Recent surveys show that Canadians view air quality and climate change as two of the most important environmental issues. Collectively, we view clean air as essential to our health and quality of life, but we're also concerned about the potential risks that increasing greenhouse gas (GHG) emissions may pose to the global climate.

Of the two, air quality is the more immediate issue and we possess the technologies to address it. Canada's air quality is affected by a number of factors, among them unwanted byproducts such as sulphur dioxide and nitrogen oxides from industrial processes and the use of fuels for light, heat and transportation. Average air quality in Canada has improved over the last few decades, but smog remains a concern, especially in large urban areas. The good news is that technology is evolving to address air pollutants by removing contaminants from smokestacks and tailpipes.

In contrast, dealing with climate change is much more complex and a longer-term task. Quite simply, increasing population and economic growth globally will raise the demand for energy, of which the largest share will come from hydrocarbon sources. Since generating energy from this source involves combustion, GHGs, such as carbon dioxide (CO₂), will grow.

Changing this picture will not be simple. Unlike the challenge to improve air quality, which can occur through evolutionary technologies, CO₂ emissions can only be reduced materially through genuine breakthroughs. We have yet to discover or develop an energy source that meets the world's enormous energy needs with no environmental impact. This cannot, however, be an excuse for inaction. We have to implement existing technologies to solve

known problems now. At the same time, we must search for the means to address issues beyond our reach, providing the conditions for longer-term technological breakthroughs.

In getting off to a good start in any race, it's best to begin where the ground is familiar and where we can make progress quickly. This is particularly true in long races. When it comes to air quality, we've been running a marathon for some time, with good results to show for our efforts. For instance, the petroleum industry has had success in reducing emissions of volatile organic compounds (VOCs), a group of gases and vapours that contribute to smog. Since 2001, VOC emissions from our facilities have been reduced each year, cutting emissions by more than a quarter despite increased throughput. One way this has been achieved is through the installation of vapour recovery units at distribution terminals in smog-prone areas.

As well, billions of dollars have been invested in our country's refineries to significantly reduce the sulphur content of gasoline and diesel fuels. Imperial now produces motor fuels that are among the cleanest in the world. These fuels are the key ingredients that allow new vehicles to produce about 90 percent less smog-forming emissions than past vehicles (see "Contributing to Cleaner Air," page 16).

There are still other opportunities to improve air quality. Part of the solution lies in the development of supportive regulatory frameworks and policies that promote positive results. Here's a recent success story that illustrates what's possible when innovative approaches to regulations are fostered. Canada's petroleum refineries are starting to operate under a new framework to reduce emissions. It was designed by government, industry and community groups working together. The result? A progressive path that allows refineries to achieve significant emission reductions using optimum technologies.

While there has been good progress on air quality, collectively we must also address the challenge of climate change seriously and honestly. It is an area where there are no easy solutions and where action is required on many fronts over the long term.

And, although our understanding of climate change continues to improve, it remains an extraordinarily complex area of study. For that reason, governments should continue to fund research to increase our knowledge of not only the possible effects resulting from human activities but the natural elements that are, and have been, a part of the climate system.

We should also pursue public policies that start gradually and evolve along the way, with full recognition of the economic con-

sequences of certain actions and the need to engage all countries. More than 80 percent of the growth of CO₂ emissions is expected to take place in the developing world, with only 15 percent of the growth from developed countries. Climate change is a global problem, and, therefore, governments need to encourage global action.

We need to take steps at home to reduce emissions in effective and meaningful ways. One clear area of opportunity is through energy efficiency. Major technological advances have been made to improve the efficiency of heating, lighting, air conditioning and appliances. On the industrial front, companies have introduced energy-efficient equipment and processes.

At Imperial, we've improved the energy efficiency of our operations. Our refineries are about 16 percent more efficient than they were just over a decade ago. This has produced savings equivalent to providing heat to about 80,000 Canadian homes a year. This is pragmatism in action: saving energy while reducing GHGs. Of course, more can be done to improve energy efficiency but we should be clear that the trend of rising emissions cannot be reversed through efficiency alone. At best, energy efficiency advances can only slow the rate of increase.

The most critical tasks remain – expand the use of economic, lower-emission technologies and maintain the search for innovative approaches that can reduce GHGs released through the combustion of hydrocarbons. The situation is clear: if we are to meet growth in energy demands and environmental expectations, we will need to draw on all available energy supply options.

Renewable energy is one option. The use of wind, solar and hydro power will increase, but it is important to put this growth into perspective. Even with better than 10 percent annual growth rates, wind and solar combined are not likely to contribute more than one percent of the world's energy needs in the next 25 years. By comparison, as pointed out by the International Energy Agency, more than 80 percent of future energy needs are expected to be met by oil, natural gas and coal. This is the current reality in the absence of major technological breakthroughs.

Consequently, balancing demands for energy while moderating the risks of climate change requires a commitment to develop innovative, commercially viable energy technologies that address CO₂ emissions from hydrocarbon combustion. There are some promising opportunities to explore but still more need to be considered.

Improving the fuel economy of the light-duty vehicle fleet is one opportunity. The industry, through its long-standing relationships with manufacturers of automobiles and commercial industrial engines, has invested in research and development that could lead to improvements in internal combustion engines resulting in as much as a 30 percent increase in fuel economy and lower emissions.

Reducing emissions from coal-fired power plants must also be a priority, as worldwide CO₂ emissions from this type of power generation are more than four times those from light-duty transport. There are promising technologies that involve clean coal power generation combined with the capture and storage of CO₂. Recently, Imperial joined the Integrated CO₂ Network, an industry-government research initiative to evaluate the feasibility of CO₂ capture and storage in Alberta, potentially for emissions from oil sands production as well as power generation.

We're also contributing to research at Stanford University's Global Climate and Energy Project on possible breakthrough technologies that aim to supply and use energy with significantly lower GHG emissions. The possibilities being studied range from more efficient technologies for transportation and new ways to produce hydrogen to research into underground reservoirs and aquifers for storing CO₂.

I like to think of these and other examples of action as part of a 10/50 approach to our energy and environmental challenges. The idea is to consider where we need to be 50 years from now to meet these challenges and then to figure out decade by decade how to do it.

Many of the suggestions outlined on climate change and air quality share some common characteristics. They are designed to include practical near-term actions while encouraging the development of long-term solutions. They balance the need for evolutionary and revolutionary technologies. They also allow us to test and evaluate different options over time, and to learn as we go.

What can we do to promote this approach?

First, it is the actions of policymakers that have the greatest impact in shaping our country's shared energy and environmental future, because they create the legal and regulatory framework in which multi-billion dollar investment decisions must be taken. A fact-based understanding of the global energy challenge and the energy industry is an absolute necessity to develop appropriate long-term energy and climate change policies. We also need supportive regulatory frameworks to ensure environmental goals are met in the most efficient manner. Furthermore, additional research and development is needed to create innovative and affordable lower GHG emission technologies. Finally, we must continue to evaluate energy alternatives and prioritize our actions, using thoughtful analysis of costs and benefits. As always, our focus should be to achieve the best environmental results while meeting our energy needs.

In the end, our choices should not be between more energy and more environmental protection; we must find a means of providing and consuming cleaner, more environmentally efficient energy. Now is the time, in the spirit of honest pragmatism, to move in this direction. ■

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