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Clive Mather was appointed President & CEO of Shell Canada Limited effective August 1, 2004. Shell Canada Limited is a large integrated petroleum company in Canada with three major businesses. Exploration & Production explores for, produces and markets natural gas and natural gas liquids. Oil Sands is responsible for an integrated bitumen mining and upgrading operation in the Athabasca area of Alberta and Shell Canada’s Peace River in situ bitumen business. Oil Products manufactures, distributes and markets refined petroleum products across Canada.

Clive’s career of 36 years with Shell has spanned all of its major businesses, including assignments in Brunei, Gabon, South Africa, the Netherlands and the United Kingdom. His last position was Chairman of Shell U.K. Limited, based in London.

Clive is a prominent business leader, who writes and speaks internationally on business, leadership and corporate social responsibility (CSR). He was chairman of the U.K. Government/Industry CSR Academy and currently serves on the board of directors of the C.D. Howe Institute in Canada. Clive is a trustee of the Royal Anniversary Trust and an advisory board member of the Relationships Foundation, both in the United Kingdom. He was a director of Placer Dome Inc. until its takeover in January 2006. He has previously held many public appointments in the United Kingdom including commissioner for the Equal Opportunities Commission, deputy chairman of the Windsor Leadership Trust, chairman of the Petroleum Employer’s Council and chairman of the Lambeth Education Action Zone. He has also been chairman of the IMD Business Advisory Council in Switzerland.

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I recall the exploration manager who drilled a series of abandoned wells in West Africa at horrendous cost and, apart from the intellectual fascination that dry holes have for subsurface scientists, of no use to anyone. Eventually, he came to the general manager and offered his resignation. It was refused point blank. His boss said, “This was the costliest training program I have ever paid for. I’m not having you take all that learning to the competition!”

And so it is – patience, perseverance, professionalism or just pig-headedness – but one way or another we carry on and the results do come. Techniques and technologies improve every year and, despite the increasing challenge of finding conventional resources, we continue to justify exploration budgets, not least here in Canada. Of course I have a dream that one day we won’t need to drill expensive wells to determine structures and scale – that is, we shall know from modeling in the office through advanced seismic – but that holy grail is still elusive.

Does this all matter? You bet it does! Energy is at the heart of modern civilization, it’s the core of sustainable development and it’s at the centre of how we address climate change and other systemic environmental issues.

The energy challenge is a worthy test for everyone in this conference and many more besides. If we address it and pass, then we can look forward to a future where mankind continues to enjoy the fruits and fullness of the natural world as we know it today. If we don’t address it or we fail, we face an uncertain future, where nature will compensate for the excesses of man’s impact on our fragile planet. We can see some of the possibilities already. There may be some upsides, like shorter winters in Calgary and enough sunshine in my native England to grow grapes and make half decent wine – unthinkable in my childhood. But there will be more downsides: remorseless desertification, wilder weather patterns, water shortages in some areas, floods in others.

Geo is probably a more popular prefix these days than it has ever been – commentators and journalists routinely use it to underline their global perspective. Geopolitical, geocentric, geospatial, geo-anything. At first school, I learned that the earth was round; later I was told it wasn’t really round because the poles were squashed like an orange. At university, I learned that the technical name for this is an oblate spheroid, and later still I heard on the radio that our planet is actually geoid. I looked it up: it means, “earth shaped.” So for all you earth-shaped people, thanks for having me. Geologists and geophysicists: two great disciplines, two remarkable careers – and sometimes too jolly expensive?
melting ice caps, loss of biodiversity. It sounds alarmist, but it is happening already and is predicted to intensify.

Now, energy is not the only issue here, nor the only solution. Population growth, agriculture, changing land use, fishing, etc., are all vitally important. But I want to spend just a few minutes thinking about energy.

The world’s appetite for energy is undiminished and indeed it must grow as populations increase and developing nations aspire to modern economies. China and India are the two biggest and most quoted examples, but Indonesia, Eastern Europe and South America also represent huge populations with large aspirations.

New fuels like wind, biomass, ethanol, hydrogen and solar get a lot of publicity. The reality is that it will take a long time for these alternatives to penetrate the market to make a difference. Solar, wind and hydro already make a contribution to the world’s energy supply but their combined impact is very small. It will take massive public policy support and consumer behaviour changes to bring them to levels that would have a significant impact on total supply. And what of nuclear? It’s often touted as the get-out-of-jail card if GHG emissions need to be attacked big-time quickly. Indeed, it produces minimal CO$_2$ but it has other issues and is a hard political sell. So the general conclusion is that hydrocarbons – gas, oil and coal – are going to remain the main provider for several decades to come. The issue will not be availability or affordability. The resources are there, not least in Canada, which boasts extraordinary conventional and increasingly unconventional deposits. Even at today’s prices, the economic incentive to produce them is very strong. No, the issue will be acceptability and especially the impact on our land, water and air.

A few years ago, most of us probably thought the idea of climate change was interesting, but hardly gripping. How life – or politics – changes, especially here in Canada. Today, we live in a different world where at federal and provincial levels, environmental issues currently take centre stage. The same is true in Europe, where the European Union has just committed itself to Phase 2 of Kyoto. Americans too are pressuring Bush to take the issue of greenhouse gas emissions more seriously. And from what I read of the environmental impact of China’s economic revolution, they too are becoming increasingly concerned at deteriorating air, water and soil quality.

My career in the oil and gas industry is coming to an end after 38 years. And you know, my generation may be the luckiest ever. No conscription to fight in world wars, a rising standard of living and the freedom to explore and enjoy this beautiful planet earth. My
son belongs of course to another generation and one that is adept at finding cheap deals on the web. From his laptop, he can book a flight for as little as a few dollars. My satisfaction that he can enjoy a gap year before university from his savings rather than mine is tempered by my concern about the larger question of whether the “real cost” of air travel is captured in the price of the ticket. Who is responsible for the CO₂ generated by more and more aircraft flying more and more often? Is it government or business or is it us as individual consumers?

The same applies to heating, air conditioning, road travel, sport, moving vast quantities of bottled water around the world to satisfy some consumer desire that is beyond me, fresh strawberries in your local supermarket 365 days a year and so on. My central point is that whatever and wherever the demand for energy, let’s stop the finger pointing and accept that we are in this together. Only by all sharing responsibility for action will we make a difference.

The issue of climate change was recognized in Shell Canada more than a decade ago. The company adopted a commitment to sustainable development as an overarching corporate goal and set public voluntary targets to reduce its GHG emissions. Shell Canada was not alone in this, but has certainly always tried to play a leadership role. Like many of you, I have watched Al Gore’s *An Inconvenient Truth.* Well, the truth is that I have seen enough evidence of melting ice caps and growing deserts to understand the problem. What grips me is the question, “So what are we going to do?”

Let’s start with business, which has a key role in developing new technology to help reduce energy needs and emissions. Two months ago, Shell sponsored an address to the Economics Club of Toronto by Sir Nicholas Stern, former Chief Economist of the World Bank. He makes the point in his 2007 book, *The Economics of Climate Change,* that the scientific evidence is now overwhelming: climate change presents very serious global risks and it demands an urgent global response. And as an economist – not an environmentalist, politician or other activist – he argues powerfully that the benefits of strong, early action on climate change outweigh the costs. In other words, pay now or pay much more later. If we take action now, it'll cost us a dollar, but if we wait, it'll cost us four.

I agree with Stern and I agree with Gore, but I humbly suggest both are short on solutions. So let's try to fill some of the gaps they conveniently leave. How do we:

* take carbon out of the atmosphere?
* reduce the carbon emissions of existing mainstream fuels?
* promote the development of lower carbon or new greener, renewable fuels?

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build a coalition of change that will ensure all the forces available work in alignment to address climate change?

Innovation through competition is what the private sector does best, so it won’t surprise you that I am a big proponent of technology as a key lever we can pull. Some of it – like extracting CO$_2$ from the upper atmosphere – is still very tentative. Others, like wind and solar power, are already being deployed. In Shell Canada, we are tracking and supporting many technologies, but let me flag a few that have particular interest because of their relevance to Alberta and to our major operations here.

The first of these is carbon capture and storage. The technologies are expensive and challenging but the concept is simple: you capture CO$_2$ emissions from factories and plants, compress it and pump it underground into old oil and gas reservoirs. For several years, we have been developing a project that could channel CO$_2$ from our Scotford Upgrader to depleting oil fields where it would be used to enhance oil recovery. We continue to work with industry and governments to establish a common infrastructure and an economic environment for this project. It’s not easy – and it’s not economic – especially as a retrofit, but if we can do it, I predict three outcomes: we’ll make significant reductions in GHG emissions, we’ll learn a lot, and we will have a unique opportunity to position Canada as a potential exporter of the technology.

And then there’s cellulosic ethanol, which turns waste straw left after the harvest into ethanol as a fuel. This second-generation ethanol technology is attractive because the waste straw itself produces no net carbon and the overall carbon lifecycle emissions are reduced by 90 per cent. The fuel has strong environmental credentials and there is no issue of diverting a food crop into fuel. Shell has a significant stake in the Canadian company Iogen Energy, which already has a first pilot plant in production in Ottawa and a commercial scale facility planned.

As for energy efficiency, we’ve been at this for years and always will be, as it makes a compelling business and environmental case. One example: our warm water loop at Sarnia extracts heat from water already circulating in various parts of the refinery. The design of this initiative recovers enough energy to reduce projected GHG emissions by 10,000 tonnes.

A second example: we announced last year the first commercial application of a new froth treatment technology to improve energy efficiency in the oil sands extraction process. Developed by Shell Canada with the help of Natural Resources Canada scientists at Devon, Alberta, Shell Enhance uses high temperatures to more efficiently remove sand, fine clay particles and other impurities from oil.
sands froth. With this new technology, we expect to use 10 per cent less water and 10 per cent less energy per barrel of bitumen than conventional low temperature processing. And from this improvement alone, we expect to reduce GHG emissions by up to 40,000 tonnes per year.

And we continue to explore many innovative technologies that will demonstrate our commitment to action – like gasification of the heaviest bitumen molecules, which could represent a better environmental solution for asphaltenes and geothermal energy to heat and cool our buildings. We are planning to run a trial at our Calgary Research Centre this year.

Today, thinking differently about any business means gazing at it through a lens of sustainability. Let’s take sulphur: we are a major producer and marketer of sulphur from our oil sands and Foothills gas businesses. Through research and development, we have discovered some neat ways to offset carbon. In China, pyrite is roasted to extract sulphur to produce sulphuric acid; we acquired the technology to convert pyrite roasters to sulphur burners, which are more energy efficient and will reduce GHG emissions. We now incorporate sulphur in our asphalt, which means less use of bitumen, improved road performance and lower GHG emissions. Shell Canada has also developed and patented a technology to produce sulphur-enhanced fertilizer. This can increase soil carbon sequestration while reducing nitrous oxide emissions. We’re working with fertilizer companies to further develop this technology.

All these are good practical technologies related to our business, which would contribute to Canada’s greenhouse gas management and reduction. But as stand-alone commercial investments, few are robustly economic – indeed some are very marginal. Alternative energy and carbon sequestration in particular require huge investments, especially in new infrastructure. Current rates of return make incentive for such investment low, and we cannot expect the market to stimulate necessary cash flow. It will take government action to make projects like this happen.

They need encouragement to get off the ground – which brings me to the role of government and the need for sound public policy. If Canada is to reduce its own emissions and seize the opportunity to position itself as a leading exporter of environmental technology, public policy must stimulate action on many fronts, not least technology development. The federal government’s new technology fund is a good start but it needs to be bigger and better. We need a realistic cost of carbon and the opportunity to build up substantial funds able to support the cost of carbon capture and other game-changing technologies.
Another opportunity for government is to ensure regulations require carbon management to be captured in the design phase of any new operation, building or process – whether these are power stations, factories, hotels, shops, offices or homes. Retro-fitting is very expensive and not a good use of scarce funds available for investment.

We also need to increase public awareness of environmental issues and the implications for individuals. Our strategy in Shell Canada is to focus on youth. I have personally taken this message to post-secondary students across Canada. The next generation is certainly receptive and can play a special role in educating us ‘baby boomers.’ We may tune out when politicians and environmentalists start preaching, but we will listen to our son or daughter. We must recognise the cumulative impact of our combined activities – that consumer-driven activities contribute 80 per cent of Canada’s carbon emissions while business amounts to 20 per cent of that total.

The simple fact is that each of us must get involved if we are to tackle climate change effectively. We need to take personal responsibility for our own carbon footprint – the impact of our energy usage, travel and waste. We must stop talking about “the” environment as if it were some remote concept and start taking action to protect “our” environment. And yes, that means you and me.

None of this is easy. The policy, the technology, the changes in individual behaviour – but is there an opportunity for business? Well, there is certainly a challenge if an individual company gets ahead of its competitors with a major uneconomic investment. Its financial performance would suffer and so would its attractiveness to investors. But I think there are real opportunities too. At the most obvious level, any improvement in energy efficiency goes straight to the bottom line. Cutting energy bills makes good business sense. Sound public policy will directly favour those companies whose emissions reduction programs are the most successful – avoiding penalties or gaining investment credits. Emissions trading schemes will indirectly allow efficient companies to trade in financial markets and improve their cash flows versus weaker or inefficient competitors. With good communications, those efficient companies should be able to improve their reputation and gain market share amongst consumers.

It won’t be easy and it won’t be guaranteed. But the business incentive is clear and over time could become compelling.

All change is testing, but especially when it involves cost and risk. The key will be leadership – from you and me, from politicians, civil servants, regulators and investors. Shell has tried to play this role in Canada for many years, pioneering emissions targets and
public reporting. In our view, we’re long past the time for dooms-day pronouncements, no matter how entertaining – it’s time for industry to take action. Our best bet is to use our technological know-how to make that happen.

But it takes three to tango: government, business and consumers. We need sound public policy, new technology and personal action to preserve the diversity and beauty of Canada for generations to come.

I started with a little teasing about geo careers. Let me end by saying how much I respect geologists and geophysicists, both for the enormous benefit they have brought to modern civilisation and the extraordinary technical progress they have made over my career. It’s that progress which gives me confidence that we can address the environmental challenges ahead. But it is time to get started.

Thank you.


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