AN INDEPENDENT REPORT FROM MEDIAPLANET TO THE NATIONAL POST

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MEDIA PLANET

ALTERNATIVE ENERGY

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Why we'll still need oil

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What alternative resource development means for the job market

"Hydropower, wind solar and all other forms of renewable energy are playing on the same team."

JACOB IRVING
President,
Canadian Hydropower Association

RENEWING OUR FOCUS

A realistic look at energy generation in Canada—and how we need to **adapt to sustainable solutions**

CHALLENGES

FACT 1

BIOFUELS CREATE GREEN-COLLAR JOBS

IMAGE: FOTOLIA

A growing Canadian population means increasing energy needs and exploring power options. **Fortunately, Canada is at the forefront of renewable resource development.**

Diversification: The path to Canada's energy future

Our energy landscape is constantly changing. As our global population grows and developing countries become more prosperous, the demands on energy resources will constantly be stretched thinner and we are going to need a diverse mix of energy sources to meet those demands.

In Canada we are well positioned to adopt renewable fuels, primarily ethanol and biodiesel, as a significant part of our transportation and heating fuel supply. Liquid biofuels offer all of the benefits Canadians are looking for in alternative energy. They create good, stable, green-collar jobs in both rural and urban areas; reduce the harmful impacts of transportation on the environment; and encourage local, Canadian innovation.

A sustainable strategy

The federal government has shown support for renewable fuels by putting into place a national renewable fuels standard for five per cent renewable content in gasoline and two percent in diesel. The addition of biofuels at the pumps not only takes pressure off oil supplies, it reduces greenhouse gases (GHGs) every time you drive.

Transportation emissions account for 30 percent of our GHGs, but there is something we can do about that right now. Depending on the feedstock, ethanol and biodiesel reduce GHG emissions by 62 to 99 percent, and also cut down on a whole host of other pollutants. Higher blends mean higher emission reductions and fewer particulates in our air. The end result is fewer smog days in urban centres and cleaner breathing for us all.

Looking beyond the pump

Recently, the Conference Board of Canada concluded in its report, "Ethanol's Potential Contribution to Canada's Transportation Sector", that due to its many positive benefits, ethanol should be a part of Canada's energy mix. This is following more than a year of research and the exhaustive examination of all available information. One of the key findings in the report states that government support through programs is more than balanced by the taxes paid by the industry. This means that the government has an over 100 percent return on investment and is helping to grow a strong local industry that creates jobs for Canadians and is an example to the world.

A global leader

Canada is at the forefront of renewable fuels innovation. Companies such as Enerkem, Inc. from Montreal are a stellar example of what we can accomplish. Enerkem is currently constructing a first-of-kind waste-to-biofuels ethanol production facility at the City of Edmonton integrated waste management site. This will allow Edmonton to divert almost all of its non-recyclable and non-compostable municipal solid waste into clean-burning ethanol.

In the following pages you will hear from experts in many fields of energy production and learn how Canadian companies are working to diversify our energy supply and find new solutions to growing concerns. Renewable fuels are but one part of a kaleidoscope of alternative and sustainable energy sources, from both traditional and non-traditional sources, that are going to help provide us with a secure energy supply for generations to come. We are pleased to be a part of this talented and creative group.

Tim Haig
Interim President,
Canadian Renewable Fuels Association

MY BEST TIPS

Did you know?

- The federal renewable fuels mandate is equivalent to removing one million cars from the roads annually.
- Traditional ethanol reduces GHGs by up to 62 percent—cellulosic by up to 90 per cent.
- Biodiesel reduces GHGs by up to 99 percent, depending on the feedstock.
- Construction of biofuels plants in Canada has created 14,000 new direct and indirect jobs, adding 1000 more each year.
- The biofuels industry annually adds $1.4 billion to Canada's economy.

Read more on the web:
www.greenfuels.org.

TIM HAIG
editorial@mediaplanet.com

Changes abound for Canadian wind power

An element as old as time—wind—is reemerging as the front runner in renewable energy.

According to Bill Smith, senior vice president of the energy sector at Siemens Canada, "At the moment, wind is the dominant player in the renewable energy space. Part of the reason is its history; wind energy has been around for a lot longer, and for that reason, acceptance in all parts of the world is high," he says. "Because wind energy has been around for so long, customer and technological efficiency is improving in two-year cycles."

Utilizing abudant resources

In Canada, we are blessed with a highly diverse supply of energy—but finding ways to utilize these energy forces in a sustainable and economic way is an evolving challenge.

Given that our country is home to the longest coastline in the world and some of the world's largest prairies, wind has long been sought after as an alternative to conventional forms of energy.

Scott Harper, CEO of the Wind Energy Institute of Canada, says that despite its lengthy history, the ways we generate and store wind power are constantly evolving.

"Back in the 80s we were doing 500 kw turbines on massive wind farms. Over the course of the 90s and in through the 2000s the focus started moving more towards small wind technology—homes, small businesses use—things of this nature."

Today according to CanWEA (the Canadian Wind Energy Association) wind power turbines in Canada have a capacity of 4,708MW.

That's enough to power over one million homes or equivalent to about two percent of the country's total electricity demand.

On paper, that may not seem like a lot, but Harper says it plays into Canada's move towards alternative energy.

Busting big wind turbine myths

The wind sector is not without opposition. Bill Smith concedes that "big wind turbines can constitute a form of visual pollution, and they also create noise. Both factors can cause local populations to object to them. People are more drawn to solar energy, because the panels are less obtrusive."

Helmut Herold, managing director of REpower Systems, a subsidiary of the German wind turbine company, says addressing public concerns helps develop the product.

In Ontario, provincial regulations now dictate that turbines must be 550 meters away from residential areas.

"I'd say that a lot of the early mistakes are now addressed and provinces have regulations in place to protect the people," says Herold.

He adds a significant amount of planning is put into where the turbines will go including studying bird migration habits and noise levels. Another concern is the effect of the electric fields from the turbines.

"I think if you have an overvoltage line going near your house with a few hundred thousand volts, that's creating much stronger electromagnetic fields than a 2MW generator in a machine standing 100 meters above the ground."

According to Glen Estill, president of Sky Generation, which operates in Ontario, "the big one is health, but that this issue seems to be at the fore in only one jurisdiction—Ontario." Estill points out that there are over 100,000 wind turbines around the world with hundreds of thousands of people living near them. "The Germans, Danes, and others who have decades more experience with wind look at you funny when you tell them this is the big issue."

Harper says the only way to quell opposition to wind energy is to focus on product development.

"As we learn more about this, wind turbine companies and research organizations and academia work to find solutions for those types of things," adds Harper. "The product is always evolving."

ANDREW SEALE
CHRIS FORREST, CANWEA
editorial@mediaplanet.com

WE RECOMMEND

PAGE 7

A team leader
How hydro power enables the development of several renewable resources.

"Because Canada has so much hydropower, integrating more wind and solar can be less challenging than if it might be elsewhere in the world."

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Responsible for this issue:
Publisher: David Shoemaker
david.shoemaker@mediaplanet.com
Designer: Penelope Graham
penelope.graham@mediaplanet.com
Contributors: Chris Campbell, Pierre Guimond, Tim Haig, Jacob Irving, Indrani Nadarajah, Andrew Seale

Canadian Electricity Association, Canadian Hydropower Association, Canadian Renewable Fuels Association, Canadian Solar Industries Association, Canadian Wind Energy Association, International Energy Agency, Ocean Renewable Energy Group

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Managing Director: Gustav Aspegren
gustav.aspegren@mediaplanet.com
Production Coordinator: Jemima Codrington
jemima.codrington@mediaplanet.com
Business Developer: Chris Vassallo
chris.vassallo@mediaplanet.com

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DID YOU KNOW?

How geothermal power works

Heating
In the winter, a geothermal system extracts this heat from the earth. The process is highly efficient, self-contained and produces no carbon emissions. The system consists of a geothermal unit inside your home (roughly the size of your existing furnace) and a series of pipes buried underground on your property.

Cooling
In the summer the process is reversed - heat is extracted from the house and deposited in the ground, with equal efficiency, using the same equipment.

TRAVIS SCHMIDT
Marketing Manager,
NextEnergy inc.
editorial@mediaplanet.com

Capital Power Corporation

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INSPIRATION

As Canada's alternative energy resources grow, a dialogue is needed. In order to maintain this new and diverse system, **significant investment will be required over the coming decades.**

FACT
2
REINVESTING IN THE ELECTRICITY GRID WILL GUARANTEE FUTURE SUPPLY RELIABILITY

Clean energy sets Canada apart

HOW WE MADE IT

Our world increasingly demands cleaner energy. Canada's electricity sector delivers.

According to Statistics Canada, roughly 80 percent of Canada's electricity is generated from non- and lower-emitting sources. Very few countries enjoy such a clean power system.

Even better, this clean energy advantage will grow over the coming decades. By 2030, we could easily increase Canada's clean electricity production to 90 percent of the total—if we are able to make the necessary investments in our electricity infrastructure.

An undeniably important component

Renewable energy—mostly hydro power—is the major contributor to our clean mix now. About 60 percent of our power is generated by water-power plants across Canada. Nuclear power, also with virtually no greenhouse gas emissions, accounts for another 15 percent of our clean electricity supply.

Wind and solar are green power sources that are gaining momentum in most provinces. Canada has the ninth largest wind energy portfolio in the world while Ontario's solar industry, with more than 30 manufacturers, could one day make the province a world-class solar manufacturing hub.

"Canada's electricity mix is diverse and growing more so by the year."

Pierre Guimond
President and CEO,
Canadian Electricity Association

Broadening our options

Other clean technologies such as biomass, geothermal, tidal and wave power and clean coal are under development or being added to our supply.

Canada's electricity mix is diverse, and growing more so by the year. Each electricity source has an important role to play in ensuring we have power when we need it.

For example, while technologies such as hydro and nuclear require more time and capital to build, they operate continuously and with low costs, meeting our constant power needs. Other energy types such as fossil fuels and biomass have the advantage of starting up or shutting down quickly, so they make the system more flexible. Stored water behind dams meets power needs during those hours when our demands are highest. Newer, renewable technologies such as wind and solar operate only intermittently (when the wind blows and the sun shines), but are quick to build, very clean, and increasingly economic as these technologies mature.

Supporting the system

We need to maintain, and enhance, this clean and diverse electricity system. To do so will require significant investment over the coming decades.

Capital investment in electricity infrastructure declined dramatically in the 1990s. After reaching a peak of $15 billion in 1991, investment fell rapidly to just $5.3 billion in 1997. The average age of Canada's electricity generating units is about 32 years.

The Conference Board of Canada forecasts that Canada must invest $294 billion, or $15 billion a year, in its electricity infrastructure between now and 2030, both to meet our growing power needs and to replace aging generating stations, as well as transmission and distribution equipment.

While this is a significant cost, reinvesting in the electricity grid will guarantee future supply reliability. It will also make the system even cleaner, with large amounts of renewable generation added and most coal plants retired or capturing their greenhouse gas emissions.

The economic benefits

We also have an unprecedented opportunity to stimulate the economy by supporting economic infrastructure investment that creates wealth. A recent CIBC Economics Report, "Energizing Infrastructure," makes the case for moving forward with electricity investments. According to CIBC Vice-Chairman Jim Prentice (a former federal Minister of both Industry and Environment), "For every $1 billion investment in the electricity sector, CIBC economists estimate close to 1,100 jobs will be created, for a grand total of more than 320,000 jobs building electricity infrastructure over the next two decades."

A Canadian conversation

A dialogue on the need to invest in Canada's future electricity system has already begun among politicians and stakeholders. Much of the focus is on the challenges—the large investment required; expanding the role of the private sector; reducing regulatory overlap, inefficiencies and costs that can be cleared away in the system; and the need for clearer public communications on investing in our electricity infrastructure.

Expanding this dialogue with Canadians is an imperative. An even cleaner and more reliable power system is achievable if Canadians are willing to make and support the necessary investments.

PIERRE GUIMOND
editorial@mediaplanet.com

PROFILE

CEA

Canadian Electricity Association (CEA) members generate, transmit and distribute electrical energy to industrial, commercial, residential and institutional customers across Canada every day. From vertically integrated electric utilities, to power marketers, to the manufacturers and suppliers of materials, technology and services that keep the industry running smoothly—all are represented by this national industry association.

ETHIOPIAN MUSTARD: A NEW PLAYER IN AVIATION'S CARBON NEUTRALITY

PHOTO: AGRISOMA BIOSCIENCES

Few industries see the urgency of biofuel research and development as the aviation industry.

The aviation industry generated nearly 650 million tonnes of carbon dioxide last year says Wajid Chishty, research officer at the National Research Council of Canada's Gas Turbine Laboratory, which is part of the Institute for Aerospace Research.

"The (industry) wants to reduce its carbon footprint," says Chishty.

Reducing the atmoshperic impact

With its sights set on carbon neutrality and a 50 percent reduction of greenhouse gases (GHGs) by 2020, it's no surprise that biofuel development has become a chief concern of the sector.

According to Chishty, the price volatility of crude oil and diversifying fuel sources also play a big role in bio jet fuel development.

In the third quarter of 2011, Air Canada spent $943 million on fuel.

"This is the largest single expense for the industry," says Chishty.

But reducing the carbon footprint of the industry won't lie in the development of new aircraft technology so much as the bio jet fuel industry's ability to adapt its product to meet the demands of current aircrafts.

"For now, and for the next 20 to 30 years that current aircrafts and the current aircraft engines are in service, any new fuel that is brought up—biofuel being one of them—have then to meet a specification according to the engines," says Chishty.

At the moment, oils refined from canola and mustard make the most likely candidates for organic-based fuels.

A new staple

Ottawa-based Agrisoma Biosciences have turned their focus towards Brassica Carinata, an oilseed commonly referred to as Ethiopian mustard (a cousin to the tabletop condiment).

Patrick Crampton, vice president of business and product development for Agrisoma, says, "The aviation industry demands a drop-in solution that meets all the stringent safety standards."

Crampton says the fastest and most sustainable track is developing a crop platform where the oil is non-food and can grow in semi-arid or tough areas. This will prove vital to the economic viability of bio—jet fuel development.

He points to the southern prairies where on any given year there's over five million acres of foul land.

"There is an opportunity to introduce an industrial oilseed crop onto those acres in rotation and improve the overall land use," says Crampton.

ANDREW SEALE
editorial@mediaplanet.com

NEWS IN BRIEF

A NEW WAVE
The testing of an EnCurrent generator at a Manitoba Hydro facility.
PHOTO: OREG

Leading the way in renewable ocean energy

Five years ago, Canadian interests set out to capture a position among the world leaders in marine renewable energy, by forming the sector association (www.OREG.ca) to create a place for the industry to emerge—and a market to drive it. The foundation has been set and November 2011 has seen the release of a roadmap that finds Canada in a leadership role.

Canada has committed more than $75 million in federal SDTC and ecoEnergy, and provincial support to renewable wave, tidal and in-stream river energy development projects in the last five years; $100 million will be invested in phase 1 of demonstration in Nova Scotia; installations of technology arrays could see upwards of $500 million invested in the coming five years.

A renewed focus

In 2010 to 2011, Canada witnessed a dramatic increase in support for marine renewable energy: plans for focused feed-in tariffs in Nova Scotia and British Columbia, a resource-development strategy in Quebec, the inclusion of marine renewable energy in federal research and development funding programs and fiscal supports for renewable energy. In July 2011, the Government of Nova Scotia announced its plan to create the "winning conditions" for development of an in-stream tidal energy sector that will serve Nova Scotians for generations to come; an industrial strategy, 65 MW by 2015, another 300 MW in five to 10 years.

The new Roadmap targets 75MW of wave, tidal and river current installation by 2016, 2,000MW in Canada and Canadian businesses involved in 50 percent of world projects by 2030.

Read more on the web:
The Roadmap is available at: oreg.ca/web_documents/mre_roadmap_e.pdf .

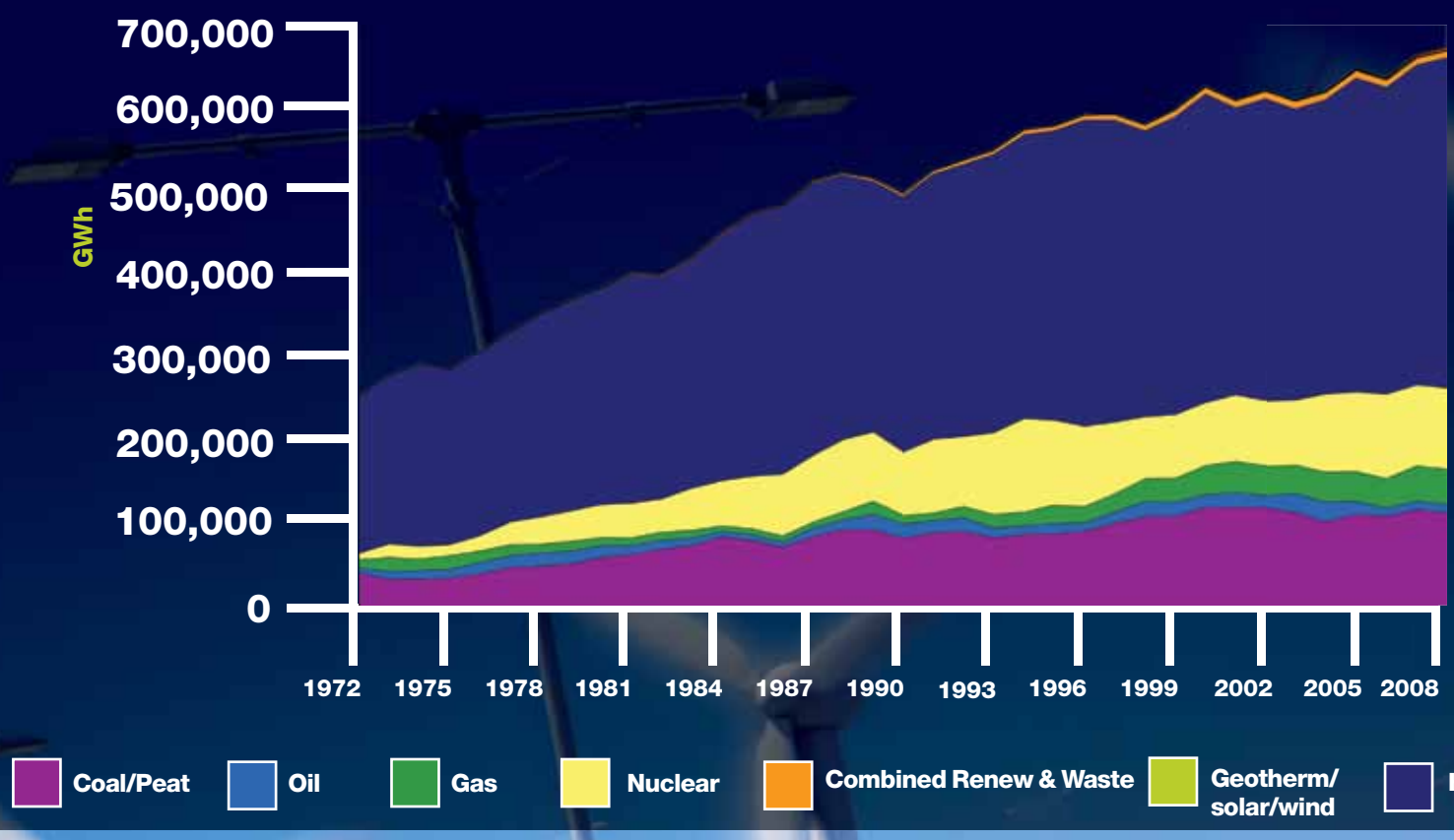
CHRIS M CAMPBELL PH. D
Executive Director,
Ocean Renewable Energy Group
editorial@mediaplanet.com

INSIGHT

FACT 3

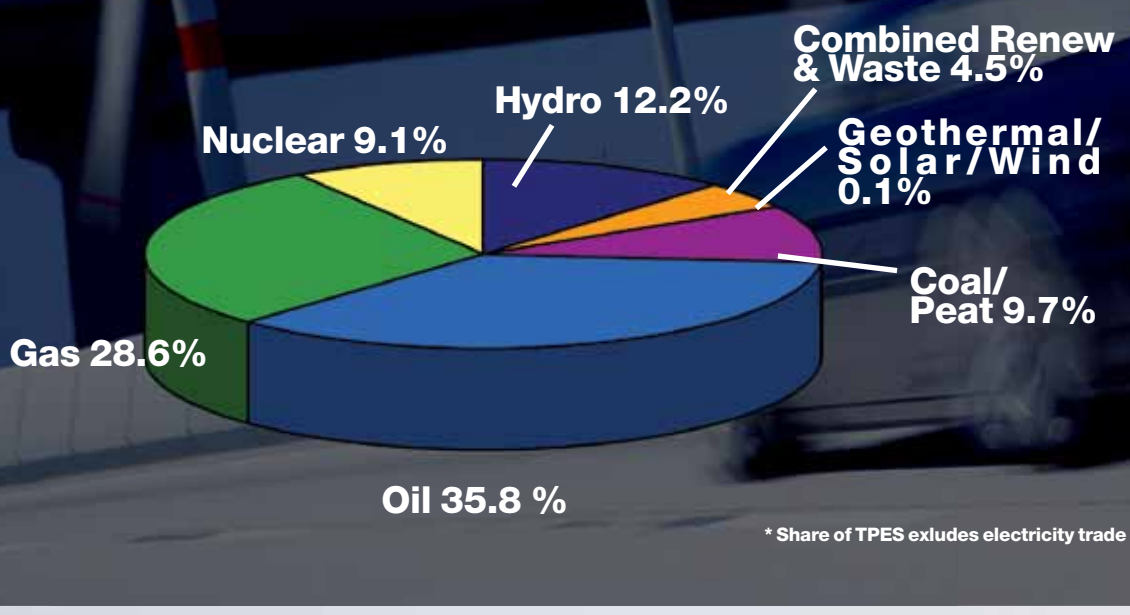
SIXTY PERCENT OF OUR POWER IS GENERATED BY WATERPOWER PLANTS

ELECTRICITY GENERATION BY FUEL IN CANADA



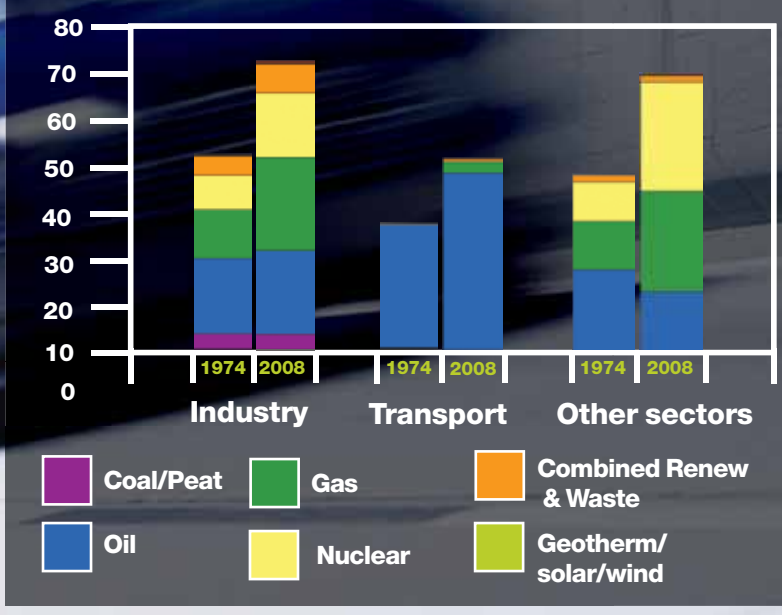
Courtesy of IEA, © OECD/IEA 2010

SHARE OF TOTAL ENERGY SUPPLY* IN 2008



* Share of TPES exludes electricity trade

BREAKDOWN OF SECTORAL FINAL CONSUMPTION BY SOURCE



In addition to being Canada's largest source of electricity, Hydropower enables the development of other clean energy sources.

Jacob Irving

President, Canadian Hydropower Association

INSIGHT

Hydropower: A true team player

Scoring goals can turn a player into a star. But a truly great player doesn't just score goals. A great player makes their teammates great too. This is exactly what makes hydropower Canada's most valuable player in the clean and renewable energy game. At 60 percent of overall generation, we are already Canada's largest source of electricity. Canadian hydropower has some of the lowest full life-cycle greenhouse gas emissions and it produces no air pollution. Canada is also the second largest hydropower producer in the world—only China generates more. Hydropower projects could mean more than 125 billion in investments and over a million jobs for Canadians over the next twenty years. What's more, Canada could still more than double its current installed hydropower capacity, as we strive to meet energy demands and reduce environmental impacts.

Supporting a sustainable nation

Canadian hydropower is a clean and renewable electricity source that enables the development of other clean and renewable electricity sources such as wind and solar power. The sun shines and the wind blows with varying intensity which makes wind and solar variable electricity sources. Because water is stored and managed by hydro facilities, hydropower can be ramped up or turned down more quickly than any other form of generation. This helps make hydropower the most flexible form of electricity generation; allowing it to smooth the production peaks and valleys that wind and solar present to the grid. In this way, hydropower helps maintain reliable and secure electricity supply as newer renewables are introduced.

An enviable energy position

Because Canada has so much hydropower, integrating more wind and solar can be less challenging than it might be elsewhere in the world. This increases our ability to add more clean and renewable electricity from more sources.

Hydropower, wind, solar and all other forms of renewable electricity are playing on the same team, pursuing the common goal of sustainable development. In Canada, hydropower continues to lead the way in the development of clean and renewable electricity.

JACOB IRVING

editorial@mediaplanet.com

NEWS

SOARING INNOVATION Solera Sustainable Energy Company's innovative "Solar Sail" at the Ajax Operations Centre.
PHOTO: ROBBIE GOULDEN

How solar power is providing a bright employment future

■ **Question:** What are the rich incentives created by renewable energy development?

■ **Answer:** A positive impact on the economy and job market is just one of of the benefits of pursuing cleaner energy resources.

As the government and the public alike begin to put more pressure on vendors of conventional forms of energy such as fossil fuels, the growth in support for alternative energy is fuelling a job renaissance.

Jon Kieran, chair of the Canadian Solar Industry Association (CanSIA) and director of EDF Energies' solar operations, says the development of Ontario's Green Energy and Green Economy Act (GEA) is a step in the right direction but we are still behind the curve.

"Jurisdictions do not require vendors who are supplying much of the conventional energy in North America to pay the true cost—I'm referring to generators who use the atmosphere as a waste receptacle and there are real costs to that," he says, adding that those costs are becoming more apparent.

The economic impact

He says the key to an effective power system is finding balance.

"Nothing should be a 100 percent; the whole basis of a well-managed power system is to find a diverse mix," says Kieran.

Since the Ontario government established the GEA and Feed-in-Tariff (FIT) program—a contract which offers stable pricing for renewable energy and an 11 percent return on investments—the province has seen a growth in support for renewable solutions.

"Jobs are not a highlight of Ontario's adoption of green energy; in fact it was a specific foundation of the program to condition the procurement of green energy on the creation of jobs," says Kieran. "And the way they did that was through the domestic content requirements."

Kieran estimates 20,000 jobs have been created as a result of the act.

South Korean company Samsung, signed an agreement worth $7 Billion to develop 2500MW of renewable energy through wind and solar.

The deal has faced some scrutiny with critics pointing out that "the government had shut out local companies by giving Samsung preferential access to the electricity grid."

Stefan Baranski, spokesperson for Samsung's renewable endeavours in Ontario says the deal will create 16,000 direct and indirect jobs.

"This is a job creation project as much as it is a renewable energy project," says Branaski.

But critics point out that with the exception of an estimated 900 jobs in the manufacturing plants required to build the turbines and solar equipment - the majority will be temporary construction jobs.

"Ultimately it will create the world's largest cluster of wind and solar power," says Samsung's Stefan Baranski.

Baranski calls it a "win-win" for taxpayers.

"The developer in this case is taking on all the risk when it comes to cost overrun or delays in the project," says Baranski.

"They sell their power to the grid at the same FIT prices that any renewable energy company gets under the program."

But what role does solar play?

"Solar belongs into the mix, there's no question," says Kieran.

Solar's availability during peak times between seven a.m and seven p.m. make it a viable source of energy.

"Solar power is providing the energy at exactly the time when a) energy is most expensive in the margin and b) the sources that are providing energy solutions at the margin tend to be the dirtiest," says Kieran.

But it hasn't been a smooth ride.

With the recent announcement by the Ontario Power Authority in October to review the FIT program, some in the industry feel the slowdown in granting new solar contracts is hindering development of an important asset.

Michael Guest, vice president of Operations for Conestoga Solar in Cambridge says the process has become "very painful."

"I've got nine or 10 million dollars of work sitting there waiting for me to do, I can't do it until I get the final signoffs and right now the OPA isn't releasing any contracts to anybody," says Guest.

He says he eventually hopes the nine-to-10-month contract process will improve as alternative energy continues to pick up steam.

Steve Eng, of Enviro-Energy Technologies says that although the "incentives are rich", the FIT process backlog has definitely impacted the industry.

"Having said that, a lot of people focus on the fact there's only a FIT and Micro-FIT program in the province," says Eng pointing to the Net Metering program—a program throughout Canada that allows energy users to utilize renewable energy with their meters which returns the energy they generate to the grid, offsetting their energy bills.

ANDREW SEALE
editorial@mediaplanet.com

The amount of energy required worldwide is increasing, but aware of fossil fuels' limitations, **Canada is exploring other options.**

The search for new alternatives

The world's dependence on oil and gas will continue for the foreseeable future, but governments are aware that coming up with alternatives forms of generating power is critical for their country's wellbeing.

Canada is no different.

Far from being overwhelmed by the challenge, Siemens Canada Senior Vice President Energy Sector Bill Smith, says looking for more sustainable, less polluting ways to generate power is proving to be fertile ground for innovation.

Increasingly, Canadians are looking for ways to use these finite resources more efficiently, while decreasing their carbon footprint. "Canadians want their energy to be clean, reliable and available when we need it. I am encouraged by what I see in Canada as there is growing momentum behind the sustainable adoption of energy here," says Smith.

Today, global energy production from sustainable sources is in the single digit figures, but this will rise to about 20 percent over the next 30 to 40 years, he notes.

Carbon capture and sequestration or storage from coal-fired power plants technologies are also emerging. The question for countries to consider is, "what do you do with it [stored carbon]?"

The International Energy Agency estimates that globally, over 200 power plants need CCS technology in the next 20 years (by 2030), in order to prevent temperature rises of over three degrees celsius. Research from the Massachusetts Institute of Technology suggests that carbon sequestering can reduce human-generated CO2 to 80 percent of 1990 levels by 2050.

Wind and solar energy

Renewable energy production is fuel friendly, and it is also relatively environmentally friendly, says Smith.

People are accepting of wind technology due to it's long-term use, though there are areas of concern like visual and noise pollution. Both factors can cause local populations to object to big wind turbines, Smith points out, but technological efficiency and planning is improving in two-year cycles.

The amount of electricity generated by wind in Canada remains small compared to other sources such as hydroelectricity and coal. As at October 2011, wind power capacity represents approximately two percent of Canada's electricity demand, with approximately 4,708 megawatts of generating capacity.

Solar energy is also well accepted and is going to be strongly established in southern Ontario, says Smith. "But we will need to see technology improvements. The price point of such energy will also fall as capacity increases. The price point for solar panels has fallen over the past six months, but this has mainly been due to an oversupply."

Tidal power

Smith christens tidal power as a more "exotic form" of renewable energy, which generates electricity by capturing the energy contained in moving water caused by tides. Tides are completely predictable and therefore produce reliable power and generally have low environmental impacts.

Tidal power is already being harnessed in Canada but on a small scale. The Bay of Fundy between New Brunswick and Nova Scotia is the most promising location in Canada for more large-scale tidal energy generation. According to the Pembina Institute, it could potentially produce as much as 30,000 MW of energy.

A multi-pronged approach is needed

Canada recognizes that it will have to adopt a multi-pronged approach to energy. Currently, hydro dominates electricity production here because of our large landmass and abundant water supply, says Smith. In fact Canada, the second largest producer of hydroelectricity after China, is one of the few countries to generate the majority of its electricity from hydroelectricity (59 percent in 2006).

Nuclear power, which produced 15 percent of Canada's electricity in 2009, will continue to be relatively stable, but it will be interesting to see people's reaction to that, especially after Fukushima. "We should get a better idea of the position of nuclear power in Canada in a year or so."

Bill says the concept of sustainability excites him. There is no question about the amount of carbon dioxide that is being released into the atmosphere, says Smith. "Maybe the climate can adjust, or maybe it can't. Regardless of one's personal opinion about climate change, shouldn't we be looking for more efficient ways to do things?"

INDRANI NADARAJAH
editorial@mediaplanet.com

DON'T MISS!

The continued importance of oil and gas

Oil's importance to mankind has evolved slowly. According to the ancient Greek historian Herodotus, unrefined petroleum or "rock oil" was used to light oil lamps in the fifth century B.C. Later, Alexander the Great used flaming bowls of oil to scare his enemies.

In the 19th century, oil from coal was used to light London streets. However, the industry was given a real boost when it was discovered that kerosene could be extracted from crude oil and used as a clean fuel. Petroleum found itself in great demand, and by the 20th century had become a hotly traded commodity on the world market.

In 2007, the Energy Information Administration estimated that the world's primary sources of energy consisted of petroleum (36 percent), coal, (27.4 percent), and natural gas, (23 percent), giving fossil fuels a grand total of an 86.4 percent share in primary energy consumption.

However, with growing international concerns about oil's greenhouse gas emissions, some governments are taking radical steps to reduce their country's reliance on the commodity. In 2006, for example, the Swedish government announced it planned to be totally oil-free by 2020. This date has since been revised to 2030. One thing is clear though the global momentum to reduce oil use is only going to increase.

Fuelling transportation

Natural gas is proving to be more politically acceptable. Gas is commercially extracted from oil fields and natural gas fields, and burning natural gas produces about 30 percent less carbon dioxide than burning petroleum and about 45 percent less than burning coal, while producing an equivalent amount of heat.

Canada is also the third largest producer of natural gas in the world.

The International Energy Agency (IEA) has estimated that, despite an increased share of gas in the global energy mix, oil is to remain the largest energy source till 2035.

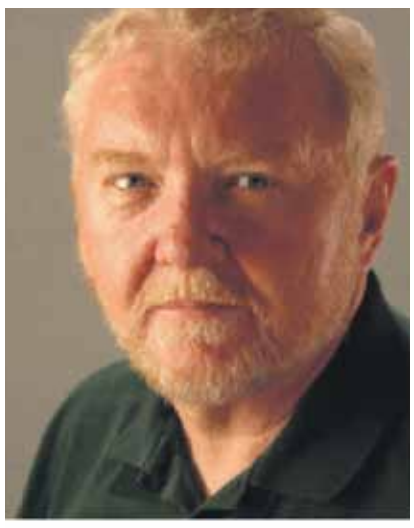
Siemens Canada Senior Vice President Energy Sector Bill Smith agrees with this assessment. "It is a fact that fossil fuels like oil, gas and coal will still play a large role, and that is not likely to change anytime soon."

The reason is that our main modes of transport rely heavily on oil, explains Richard Jones, IEA deputy executive director. There are other factors that add to oil's lustre—its history, the fact that it is found in many parts of the world and that it is a known and mature technology.

However, natural gas growth will become more important, especially for public transportation, Jones adds. Gas is cleaner than coal, but it still produces more carbon dioxide than renewable energies.

INDRANI NADARAJAH
editorial@mediaplanet.com

It Is Time For A Balanced Approach to Ontario's Energy Policy



By Don MacKinnon
President
Power Workers' Union

With Ontario's election over, our newly elected MPPs have the opportunity to get down to work on fundamental issues critical to the future of our electricity system and economy. These include: the importance of nuclear and biomass generated electricity; sustaining a viable provincially owned transmission company; and, making transparent investments that deliver real economic, environmental and social benefits.

The flaws of Ontario's green energy policies are increasingly obvious: huge subsidies to wind and solar developers paid for by Ontario ratepayers; questionable sustainability of forecasted green jobs; single source contracts that threaten all Ontario exporters with retaliatory trade practices; the cancellation of two gas plants whose locations and justification were ill-considered; hidden costs related to the Clean Energy Benefit and the transmission systems necessary to accommodate wind and solar installations; and, the ignored concerns of rural Ontarians opposed to industrial wind farms.

Ontario's long-term energy plan commits billions of dollars for intermittent wind and solar power and carbon-emitting, price volatile natural gas generation. While it's good news for the big multi-national players already benefitting from Ontario's lucrative green energy incentives, it's an ineffective way to reduce greenhouse gas emissions (GHG), needlessly pushes electricity prices higher, and transfers wealth out of province. As well, Ontario's growing dependence on environmentally questionable U.S. shale gas negatively impacts energy security and exposes Ontarians to higher heating and electricity costs when supplies are short.

There are positive aspects to the plan related to nuclear and biomass fuelled electricity. The plan calls for refurbishing Ontario's existing nuclear fleet and building new CANDU reactors for base-load supply, as well as examining the conversion of existing coal-fuelled stations to biomass and natural gas for peak demand.

3,000 megawatts of supply is scheduled to come off-line by 2020 when the Pickering Nuclear Station closes. Any further delays to the decision to invest in new CANDU reactors will undermine the province's long-term energy security and the competitiveness of Ontario's successful nuclear industry.

For over 47 years, GHG emission-free CANDU reactors have safely and reliably met Ontario's electricity needs 24/7, supplying over 50 per cent of our power today. Ontario, the primary beneficiary of Canada's successful $6.7 billion a year nuclear industry, hosts most of the 160 supply chain companies, seventy thousand plus high value jobs and R&D activity. Ontario's forestry and agricultural stakeholders, utilities, academics, and private investors support the plan's biomass initiatives. Unlike intermittent wind and solar, biomass generated electricity is available when needed, and unlike carbon-emitting natural gas does not contribute to the GHG problem. Biomass is an Ontario energy resource that creates jobs in our agriculture, forestry and transportation sector. It's also an opportunity to kick-start a high value bioenergy industry producing new transportation fuels, chemicals and materials.

Linking investments in nuclear and biomass makes even more sense when tied to a plan that encourages the use of zero-emission electric vehicles. British Columbia and Quebec are moving forward with a strategy to provide the necessary infrastructure for electric vehicles. Ontario needs to do the same.

Supporting Ontario's world-class transmission company is also vital. Since 1906, Hydro One's vast transmission and distribution network has reliably, safely and affordably delivered electricity to Ontario homes and businesses. Dedicated work crews provide quick province-wide response to system outages and large-scale emergencies like the 1998 ice storm. Unfortunately, Ontario's successful transmission model is being subverted under the guise of renewable energy projects, turning the transmission grid into a patchwork of privately owned transmission systems.

Ontarians deserve reliable, secure and environmentally responsible electricity at a price they can afford. Reinvesting in Ontario's electricity assets and existing industries is a better way to keep electricity prices affordable, reduce GHG, and create more sustainable jobs and innovation while keeping the economic benefits here. It's time for a more strategic, balanced approach to energy policy making.