



## Seminar #1

“The Role of Nuclear Power in Ontario’s Long Term Energy Plan”

Assistant Deputy Minister of Energy, Rick Jennings

Mindfirst Inc.

<http://mindfirst.com>

Toronto, Ontario

[events@mindfirst.com](mailto:events@mindfirst.com)

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# Introduction

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## Mission

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To provide an unbiased, objective platform for the informed discussion of important energy issues thereby encouraging deployment of better, more sustainable decisions.

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## Mindfirst™

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Mindfirst Inc. (M1) was founded in 1999 to provide strategic planning services for growing businesses focused on taking advantage of opportunities in the areas of clean energy, clean technologies and sustainability opportunities. M1 has developed a significant database of organizations, contacts, best practices and analytics, which it mines to facilitate business development, investment, partnership and other activities. Most recently Mindfirst™ has created and organized seminars and conferences with a view to help inform energy discussions.

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## Future of Nuclear™

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The first Future of Nuclear™ (FoN) conference was held in Toronto on October 9, 2013 at MaRS™ Discovery District to address the need for an unbiased, objective discussion regarding the future of nuclear power. The conference targeted industry executives, stakeholders and affiliates, as well as those who are generally concerned about nuclear power and associated policies/practices. Participants in the conference expressed a need to explore the complexities of nuclear power issues in more detail. This led to the creation of the FoN Seminar Series, which is a series of luncheon seminars discussing nuclear energy related topics over the course of 2014. The first of six seminars featured Assistant Deputy Minister from Ontario's Ministry of Energy and Infrastructure, Rick Jennings, who spoke about Ontario's recently released Long Term Energy Plan (LTEP) and the role of nuclear energy as part of that plan. The LTEP report, entitled "Achieving Balance", addressed the growing role of renewables in the energy mix, the ongoing need for safe, reliable base load energy and the export business development potential for the nuclear industry.

## Top 10 Learnings

A survey is conducted at the end of each Future of Nuclear™ seminar to gain additional insights from the event. An open-ended question was asked of participants in the questionnaire, “What was the most important insight, ‘takeaway’ or actionable information that you learned at today's Seminar?” The responses to this question are extracted and summarized in this section with edited commentary from Mindfirst™ associates based on research to support and clarify the expressed views. For the purposes of summarizing The Top 10 Learnings from this Seminar, the responses were categorized into six main points.

### The importance of balance in long term energy planning

#### Selected quotes from seminar attendees

- “I appreciated both the importance and the difficulty of achieving balance in long-term energy planning, which requires an appropriate amount of flexibility to make course corrections in the future – including a re-evaluation of the role nuclear will play.”

#### Discussion

The title of Ontario’s LTEP is “Achieving Balance”, which underscores the importance of balancing not only the energy demands of Ontarians with the cleanest available supply options, but also balancing the interests of thousands of key stakeholders across the province. Below is a tabulation of all solicitation and consultation activities [1]:

- 12 regional sessions
- 10 Aboriginal sessions
- Over 1000 EBR submissions
- 7883 questionnaires
- Significant volume of form e-mails through letter writing campaigns
- 673 technical session registrants
- Approximately 275 Aboriginal session registrants
- Over 300 open house attendees

The Ministry of Energy advances the following balancing principles that will guide future development of Ontario’s energy infrastructure [1]:

1. Cost-effectiveness
2. Reliability
3. Clean energy
4. Community engagement
5. Emphasis on conservation and demand management before building new generation

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## The importance of flexibility in long term energy planning

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### Selected quotes from seminar attendees

- “I did not know that Ontario's LTEP is revised every three years, adjusted to changing conditions and needs.”
- “It was interesting to see how the government ‘thinks’ when it is coming up with a long term energy plan - in that they plan on meeting demand needs well into the future with current technology. I was happy to learn that they have built some flexibility into the plan to account for technological game changers.”
- “In the near future, nuclear refurbishment is the plan and no new build. With that said, since LTEP is updated every three years, the need might be changed too in the future.”
- “I learned that the Ontario government will revisit the nuclear new build decision every three years. The Ministry of Energy has created a Long Term Energy Plan using short-term vision that will inevitably box the Province into using natural gas solutions for quick build, as demand will increase in coming years.”
- “Canada is one of the only modern industrial nations that does not have a thermonuclear fusion program, and could realize one day not too far away that our vast ‘energy resources’ have become obsolete.”

### Discussion

Nothing in the LTEP is set in stone. The Province of Ontario recognizes the inherent uncertainties in demand projections and has, in response, established the following [1]:

- Ontario Energy Report, which will provide Ontarians the supply/demand landscape annually (starting in 2014).
- A three-year revision cycle to “give everyone an opportunity to monitor progress and understand developments that will be important in the next formal review”.

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## Canadian nuclear sector faces short term gain but potentially long term pain

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### Selected quotes from seminar attendees

- “The assessment of one of the participants whom I spoke to was that the provincial and federal governments have decided that the CANDU<sup>®</sup> (beyond refurbishment of existing reactors) is no longer a viable technology economically in comparison to the light water reactors, and there will never be another CANDU<sup>®</sup> built in Canada. Whether or not that is a fair assessment, it seems clear from the remarks that there is not much federal support to promote international sales.”
- “I learned that the Province stands behind the excessive build-out of wind/solar backed up by natural gas and the prospect for new-build nuclear is bleak.”

## Discussion

Shelving nuclear new build in Canada while placing an emphasis on refurbishment has two consequences. One outcome will be that the industry will experience short to medium term growth as both the Province and Bruce Power invest in large capital programs to upgrade their fleet. The nuclear industry will benefit from a final “resurgence” as retirees come back to offer whatever they have left in order to upgrade the large fleet of reactors (short-term gain).

The unintended consequence will be that Canada’s role will be significantly diminished on the global stage as the rest of the world gains proficiency and develops new nuclear capability (i.e. China, India, Russia, Japan) while the Canadian nuclear know-how continues to decay (long-term pain). With the policy in place today, the Province of Ontario risks losing its nuclear capability altogether. If the other low carbon options (conservation, renewables, hydro) do not deliver on their promises to meet future demand, then the Province of Ontario may be forced to either revive carbon intensive options (natural gas or coal), or import new nuclear technology beyond 2031.

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## For long term survival, the Canadian nuclear sector must find export markets

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### Selected quotes from seminar attendees

- “It came as a bit of a shock to me when I learned the seriousness of the crossroads that the Canadian nuclear sector is at.”
- “I learned that the government is committed to exporting nuclear expertise, but what I did not hear was how?”
- “I am concerned that Canada will face a reality like Britain, which is having France build their new nuclear plant.”
- “I learned that it costs Ontarians millions in taxpayer dollars to maintain the site license with the CNSC to build new nuclear power plants. But nuclear is not built overnight due to the long lead times. So even if the site license remains open, the LTEP may compromise the future of nuclear in Ontario altogether as the pre-existing expertise vanishes to retirement.”

## Discussion

The nuclear sector is at a crossroads in Canada. While the LTEP affirms a commitment to nuclear by a decision to refurbish its pre-existing fleet and to support the export of nuclear capabilities, it remains silent on the mechanisms that will be used to evolve the Canadian nuclear industry so that it can compete in the global market place beyond 2031.

Ontario Power Generation (OPG) intends to maintain the site license granted by the Canadian Nuclear Safety Commission (CNSC) for building the two new nuclear units envisioned for the Darlington site. However, this action may cost taxpayers millions and not yield the intended benefits. The nuclear industry depends heavily on the aging boomer generation that possesses the deep technical expertise to either refurbish or build new CANDU<sup>®</sup> nuclear power plants. The knowledge vacuum left by the experts

as they exit the industry at a rapid rate can only be filled if there are adequate commercial opportunities for younger and seasoned generations of nuclear professionals to collaborate and learn. In so doing, the knowledge will be passed along, giving Canadians a hope for sustaining the industry. The competitiveness of Canadian nuclear plants must be ensured in Canada before it can be viewed as competitive abroad.

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## Installed capacity is “best-case”, not what is generated at any given time

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### Selected quotes from seminar attendees

- “I am concerned that the public is not receiving the correct message about the costs/benefits of renewables.”

### Discussion

The LTEP states, “By 2025, 20,000 MW of renewable energy will be online, representing about half of Ontario’s installed capacity.” While this may sound impressive, without a capability to store such vast quantities of energy, the real output to the grid is expected to be a mere 6,700 MW (roughly 33% of 20,000 MW or 17% of the generated capacity). This really means that out of the 20,000 MW installed capacity, 13,300 MW of it will not be available to Ontarians at any given time.

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## There is a disconnect between political interests and long term requirements

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### Selected quotes from seminar attendees

- “I learned how complex energy policy decisions are in a political environment.”
- “I fear that the government has little interest in developing nuclear expertise, and sees little downside in having this sector whither.”

### Discussion

It is critical for the young generation of educated energy professionals to get involved in the process of energy planning. It is a highly politicized field. When it comes to long term infrastructure planning, the interests and outlooks politicians have may be at odds with the interests and outlooks of future generations. It is the younger generations that will either be saddled with or benefit from the good or bad decisions made by an older generation of politicians and bureaucrats.

## Conclusions

The presentation by Assistant Deputy Minister of Energy and Infrastructure, Rick Jennings, “Ontario’s Long Term Energy Plan and Nuclear Energy” launched the Future of Nuclear™ series by situating nuclear in the broader context of Ontario’s energy needs. It was apparent from the discussion that while the Canadian nuclear industry fights for survival, the refurbishment of a fleet of 10 reactors promises to keep the industry in good health over the next decade. Therefore, the future of nuclear will depend upon the extent to which the Federal Government, Province of Ontario and the nuclear industry can work together to capitalize on opportunities both:

- At home by (a) demonstrating a successful (on time/budget) execution of the refurbishment project, and (b) re-introducing new nuclear into LTEP over the next revisions to meet the carbon-free demands beyond 2030;
- Abroad by building strategic partnerships with governments and private sector who stand to gain from the extensive nuclear knowledge base that exists in Ontario.

Since long term energy planning incorporates a three-year review cycle, it is important for all who are concerned with Ontario’s energy future to inform the decisions through the established consultation mechanisms.

## Acronyms

CNSC	Canadian Nuclear Safety Commission
FoN	Future of Nuclear™
LTEP	Long Term Energy Plan
OPG	Ontario Power Generation

## References

- [1] Ontario Ministry of Energy, “Achieving Balance – Ontario’s Long Term Energy Plan”, 2013.

## Registered Participants

The contents of this report were created from inputs obtained in surveys and do not, in any way whatsoever, reflect the views of the organizations that the registered participants listed below belong to.

LAST	FIRST	TITLE	COMPANY
Banack	Adam	Associate	Torys LLP
Barrett	John	President and CEO	Canadian Nuclear Association
Beiki	Andisheh	Sustainability Research	Mindfirst Inc.
Belmore	Mike	External Relations Officer	Society of Energy Professionals
Bennett	Terry	Vice President	TransCanada Energy Ltd.
Bergen	Tom	Sr. Adv. Government Relations	Ontario Power Generation
Berger	Stanley	Environmental and Nuclear Law	Fogler Rubinoff
Bojic	Mihajlo	Nuclear Research	Mindfirst Inc.
Bradford	Adrian	Senior Business Consultant	Ministry of Economic Development and Trade
Butler	JoAnne	Vice President, Electricity Resources	Ontario Power Authority
Chown	Dan	Electromechanical Systems Research	Mindfirst Inc.
Crawford	Glen	Account Director	Rolls-Royce Civil Nuclear Canada Ltd.
D'Andrea	Andy	Unit Director	Society of Energy Professionals
Dart	Jonathan	Consul General/Director-General UKTI Canada	Foreign and Commonwealth Office
Drake	Nicole	Legal Assistant	Torys LLP
Fehrenbach	Brian	Director of Sales	Candu Energy Inc.
Fortin	Michel	Director of Strategy	OSEA
Freire-Gormaly	Marina	Research Assistant	Mindfirst Inc.
Gandhi	James	Manager, Business Development	Aecon
Godfrey	Michael	Business Development, AP1000	Westinghouse Electric Company
Hammond	Katherine	Vice President, Legal	Borealis Infrastructure
Hannah	Justin	Senior Manager, Marketing & External Relations	Candu Energy Inc.
Hay	David	Vice Chairman	CIBC World Markets Inc.
Hill	Krista	Partner, Infrastructure and Energy Law	Torys LLP
Hux	Robert	Member	Committee for the Republic of Canada
Irving	Gillian	Senior Communications Coordinator	Candu Energy
Jennings	Rick	Assistant Deputy Minister	Ontario Ministry of Energy
Kokhanova	Milla	Investment Banking Associate	RBC Capital Markets
Kyriacou	Elias	Unit Director	Society of Energy Professionals
Lacy	Alison	Partner	Torys LLP
Lara	Alvaro	LTEP Research	Mindfirst Inc./U of T
Leung	Derek	Manager, Contract Management	Ontario Power Authority
Maltese	Rick	Publisher	Energy Reality Project
Manad	Andres	Manager - Infrastructure & Renewables	Ontario Energy Board
Markowitz	Thomas	Consultant	Enerhope
Masuda	Mickey	COO	HOPE Innovations Inc.
McLennan	Ian	Digital Marketing Specialist	Mindfirst Inc.
Mikkelsen	John	Director	TransCanada Energy Ltd.

Monaghan	Brian	Senior Advisor	Monaghan Consulting
Movchovitch	Emanuel	Manager, Risk & Treasury	Ontario Power Authority
Myers	Jonathan	Associate	Torys LLP
Myette	Dave	Society LVP Bruce Power Local	Society of Energy Professionals
Mykhaylova	Natalia	Chemical Engineering Research	Mindfirst Inc.
Newall	Paul	Consultant	Newall Consulting
Roger	Don	Partner	Torys LLP
Russomanno	Sergio	Consultant, Nuclear Applications	RPC Radly
Shanker	Shobhit	Analyst	AMEC NSS
Shekhar	Mukul	Real Time Software Designer	Candu Energy Inc.
Siller	Ariel	Associate	Torys LLP
Tarnawsky	Lillian	Director Estimating and Cost Control	Candu Energy Inc.
Thomas	Krista	Senior Regulatory Policy Analyst	Canadian Nuclear Safety Commission
Vehovec	Henry	President	Mindfirst Inc.
Wallace	Donald	Staff Officer	Power Workers' Union
Wang	Maggie	Business Analyst	Ontario Power Authority
Zemanek	Milosz	Associate	Torys LLP

## Credits

### Authors

- Shobhit Shanker, Associate, Future of Nuclear™
- Ian Angus McLennan, Associate, Digital Marketing and Social Media, Mindfirst Inc.
- Henry Vehovec, President, Mindfirst Inc.

### Future of Nuclear Advisory Board

- Stan Berger, Partner, Environmental and Nuclear Law, Fogler, Rubinoff LLP
- Robert Bodner, Independent Consultant, Hatch
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- Jason Cameron, Vice President and Chief Communications Officer, CNSC
- Milt Caplan, President, MZ Consulting
- Paul Dinner, Consultant, Mindfirst, IAEA
- Michel Fortin, Director of Strategy and Member Services, OSEA
- Lee Harrison, IQ Partners Inc.
- Krista Hill, Partner, Torys LLP
- Colin G. Hunt, Publisher and Editor, Nuclear Canada Yearbook
- Eric Jelinski, Lecturer, Nuclear Engineering, University of Toronto
- Ronald Kwan, Assistant Deputy Minister, Corporate & Electricity, Ontario Financing Authority
- Dr. Richard Lester, Head of Department of Nuclear Science and Engineering, MIT
- Dr. John Luxat, Professor of Nuclear Safety Analysis, McMaster University

- Hugh MacDiarmid, President, VISEX Corporation
- Rick Maltese, Blogger, Deregulate the Atom, The Energy Reality Project
- Brian Monaghan, Independent Consultant
- Roger Newman, UNENE Representative, University of Toronto
- Shobhit Shanker, Analyst, AMEC NSS
- John Sprackett, Staff Officer, Power Workers' Union
- Henry Vehovec, President, Mindfirst Inc.
- Rosemary Yeremian, President, Strategic Insights Inc.

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