Nuclear Waste - A Long Lived Legacy

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What is the Canadian Environmental Law Association?

- CELA is a public interest law group
- Founded in 1970 for the purposes of using and improving laws to protect public health and the environment
- Funded as a legal aid clinic specializing in environmental law

What is CELA? /2

- CELA represents individuals and citizens' groups in the courts and before tribunals on environmental matters
- In addition, CELA staff members are involved in various initiatives related to law reform, public education, and community organization

CELA Memberships

- Founding member of Campaign for Nuclear Phase-out
- Member of Nuclear Waste Watch
- Member of Energy Vision, a newly formed network to advocate for a renewable, sustainable energy future
- Co-Authors of Power for the Future, a 2004 report prepared with Pembina Institute

A Sustainable Electricity System for Ontario

- The Independent Market Operator Forecast is that we will require 30,000 MW Peak Capacity for electricity by 2020
- CELA and Pembina, with the help of scientists at Simon Fraser University calculated that this total requirement could be met by 2020 with zero nuclear power, and zero coal plants

Sustainable Electricity - where does it come from?

- To do so would require different investment decisions for our future electricity supply
- We would get this from:
  - 12,000 MW in demand reductions, efficiency and co-generation
  - 2000 MW in load shifting
  - 750 MW in on-site solar roofs
  - 6,300 MW of Existing Hydro power
  - 3,000 MW Existing peaking gas and replaced oil

Electricity sources cont'd

- 3,000 MW Wind power
- 1,200 MW New Hydro power
- 375 MW Biomass
- 3,800 MW new combined cycle natural gas

- Based on these projections, total Peak demand is 15,216 MW and total supply is 17,909 MW leaving a 2,693 MW contingency by 2020

Our Projections

- Critics of our report note that we were far too conservative (i.e. underestimated) the potential for new wind, solar, and biomass in our projections
- For the potential for efficiency and demand reductions, we used only existing technology
- Accordingly our projections should be even more achievable than we estimated

Smart Generation - Powering Ontario with Renewable Energy

- David Suzuki Foundation issued this report in 2004 following Power for the Future
- Elaborating on the renewable power opportunities, that report estimated that Ontario has technically achievable wind resources in southern Ontario of 58% of current consumption and could install 8000 MW of that by 2012 which would be 10% of current consumption

Suzuki estimates cont'd

- The Suzuki report estimated that there is an additional 2450 MW of generation from various biomass sources also available in Ontario
- The potential for solar is 1263 MW to the grid and thousands of hot water systems, pool heaters, passive heating in new homes, and air ventilation systems which would also hugely reduce the central power demand; similarly geothermal heat pumps

How are we doing so far?

- The Ontario government issued a call for proposals for renewable power in 2004, seeking 350 MW
- They received 10 times that much in bids for renewable power in that initial call but took 395 MW of it
- Another 1000 MW call for renewable power is in progress by the Ministry of Energy at present, plus 200 MW of small and medium renewables under 20 MW each

Conservation

- Peter Love has just been appointed Ontario's Chief Energy Conservation Officer, within the new Ontario Power Authority
- He will be required to develop a Conservation Plan for the province and to report annually about how he and the province are doing in achieving the conservation objectives of the Plan

Nuclear Power - why not?

- Nuclear power is not sustainable nor renewable
  - Uranium mining in northern Saskatchewan
  - High level radioactive waste from used fuel thousands of years' legacy of highly toxic, radioactive waste - will require centuries of governance structures to safeguard

Nuclear Power - why not? cont'd

- Nuclear power is not environmentally friendly. For example:
- Routine nuclear power emissions such as tritium to drinking water are health threats
- Nuclear power presents enormous security risks - such as risk of terrorist attacks on plants, waste facilities or diversion of high level waste

Nuclear Power - why not cont'd

- Nuclear power is enormously costly - for example Darlington was 500% over budget
- Nuclear power reliability is poor - instead of a reliable 30 or 40 years of operation, major problems develop after around 12 years
- Nuclear power requires major public subsidies and special rules to operate such as the Nuclear Liability Act with its $75 million cap on liability from a nuclear accident!

Nuclear Power - why not?

- The wrong kind of accident would be irreversibly catastrophic to Ontario and is not unthinkable - consider Chernobyl in 1986, Three Mile Island in 1979, Windscale in 1957, SL-1 in 1961, NRX at Chalk River in 1952, Fermi in 1966, Lucens in Switzerland in 1969

Nuclear Power - why not? Cont'd

- In addition to these have been many other lesser known accidents and incidents in every decade since the 1950's in every type of nuclear power plant - heavy water reactors, gas-cooled reactors, pressurized water reactors, boiling water reactors and fast breeding reactors
- at least 9 accidents world wide have led to deaths from exposure to ionizing radiation

What about the Waste?

- By the end of 2004, there were 1.9 million used fuel bundles in Canada, or 45,000 metric tonnes of nuclear fuel waste and this number continues to climb with continued production of nuclear fuel waste from on-going nuclear power plant operation
- NWMO estimates the cost of managing this waste to be 24.4 billion dollars

Absurd time scale

- The time over which we have to manage nuclear fuel waste safely is at least 10,000 years - imagine if every generation over the last 10,000 years left us such a legacy!
- In one of the background papers to the NWMO process, Stewart Brand considered the challenges of designing an instrument - a relatively simple one that would reliably last for that length of time

“The Clock of the Long Now”

- In the book he subsequently wrote, Brand noted that such a clock would have massive design challenges of longevity - to display correct time for ten millenia; to be maintainable with bronze age technology; to be transparent in its operational principles; to be evolvable, I.e. to be improveable over time, and to be scalable, I.e. to work over various sizes

Implications

- The challenges and questions around governance arrangements, financing arrangements, and technological arrangements to provide for a 10,000 year legacy of radioactive toxic high level nuclear fuel waste from our current generations' decisions to meet our current wasteful and fleeting energy demands with nuclear power production dictate one answer: we must phase out nuclear power production in Canada and world wide and we must make the decision to start now.

Resources

- Nuclear Waste Watch - www.cnp.ca/nww
- Campaign for Nuclear Phase-out - www.cnp.ca
- Northwatch - www.northwatch.org
- Greenpeace - www.greenpeace.ca
- Canadian Coalition for Nuclear Responsibility - www.ccnr.org

Resources cont'd

- Energy Probe - www.energyprobe.org
- Sierra Club of Canada - www.sierraclub.ca
- Ontario Clean Air Alliance - www.cleanair.web.ca & www.electricitychoices.org
- David Suzuki Foundation - www.davidsuzuki.org
- Pembina Institute for Appropriate Development - www.pembina.org

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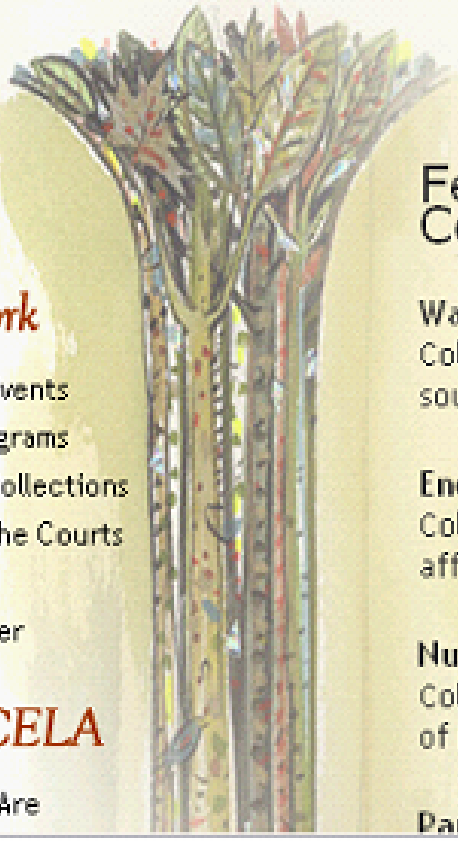

Our Work

About CELA

Featured Items and Collections

Water Source Protection
Collection of materials about protecting drinking water sources

Energy Costs and Low Income Ontario Residents
Collection of materials related to energy conservation and affordable electricity pricing in Ontario

Nuclear Phase-Out
Collection of materials related to CELA's position in support of nuclear phase-out in Canada

Partnership for Pesticide Bylaws

News & Events

May 17 2004
Canada Must Build on Toxics Treaty

May 14 2004
CELA Requests Environmental Commissioner To Investigate Ontario's Refusal To Fix Deficient Water Well Regulation

May 11 2004
Energy conservation could save Ontario $14 billion: new study

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