

Theresa McClenaghan

From: "Dorothy Goldin-Rosenberg" <dgoldinrosenberg@oise.utoronto.ca>
To: <tomadams@nextcity.com>
Cc: <energy-vision@list.web.net>
Sent: Saturday, October 29, 2005 4:55 PM
Subject: [Energy-vision] Re: effectiveness of proposed energy solutions

Dear Tom

I was not only referring to the the Bruce refurbishments which in the long run as you know will probably cost Ontario citizens plenty, but indeed to the concept of nuclear power expansion in general draining the money needed for concentrated demand management and renewables - like California and New York are taking up seriously. Ralph Torrie's presentation at the Green Energy Teach in illustrated these possibilities for us with Ontario numbers - as of course do the Suzuki Foundation and CELA/Pembina reports.

But also and very importantly, where are the studies estimating the health costs? As you know, Candu reactors routinely release radioactive tritium, a known human carcinogen, mutagen and teratogen (crosses the placental barrier). Hydrogen is the basic building block of all organic molecules. Tritiated hydrogen becomes incorporated directly into the molecules - a different mechanism from other pollutants.

Human beings can receive exposure to organically bound tritium through the ingestion of plants and animals exposed in an effluent pathway in addition to direct uptake through inhalation, absorption and drinking contaminated water. Especially sensitive to the effects of tritium are rapidly growing cells such as fetal tissue and young girls' pre puberty developing breasts, genetic materials and blood forming organs. Tritium can affect protein precursors that will make up the chromosomal strands in the DNA which can damage the DNA creating a mutational effect. The results of all these processes can result in cancers, miscarriages, birth defects, sterility, hypothyroid, etc..not only in those directly affected but also in their offspring and theirs.

In 1992, a case control study published conducted by the Ontario Cancer Treatment and Research Foundation and the Atomic Energy Control Board (AECB) indicated that death rates from childhood leukemia were 34% above the provincial average around the Pickering and Bruce Nuclear stations (97% confidence level). In May 1994, the Advisory Committee on Environmental Standards (ACES) recommended dramatically reducing the amount of allowable tritium (which unfortunately was not acted upon by the government of the day). Years earlier, other important studies and recommendations attested to the dangers of tritium. I call your attention to the 1980 Study: The Safety of Ontario's Nuclear Reactors (The Select Committee on Ontario Hydro Affairs) which contains important scientific information about tritium and carbon 14, the 1978 Report of the Porter Commission commenting on the increasing levels of radionuclides in the Great Lakes and a British study, the Committee Examining Radiation Internal Emitters (CERRI) Report (www.cerrie.org) pointing out that these

short track emitters can be significantly more dangerous than previously estimated. Then of course, in June 2005, the Biological Effects of Ionizing Radiation (BEIR) National Academy of Sciences Report illustrated firmly that all amounts of ionizing radiation large or small can cause cancer.

Notwithstanding the pain, suffering and misery of these conditions on the victims and their families, the billions of dollars that could be saved in future health care costs must also be considered. As we have been hearing lately, the costs of cancer treatments are rising exponentially according to a recent widely reported Canadian Cancer Society study.

Some of us would like to see much greater attention to these issues not only because of the obvious misery caused, but because of the health costs - no matter who pays for the initial refurbishment of a plant etc. Can you factor all these real externalised costs of cancer and other diagnoses and treatments into the equation for Ontario and if you can't, do you know who can? There must be health economists who might help with this as they are with other toxic substances as in Muir, T. & Zegarac, M. "Societal Costs of Exposure to Toxic Substances: Economic and Health Costs of Four Case Studies That are Candidates for Environmental Causation". *Environmental Health Perspectives* 109 (suppl 6):885-903 (2001).
or

Landrigan, P., Clyde B. Schechter, Jeffery M. Lipton, Marianne C. Fahs, and Joel Schwartz. "Environmental Pollutants and Disease in American Children: Estimates of Morbidity, Mortality, and Costs for Lead Poisoning, Asthma, Cancer and Developmental Disabilities". *Environmental Health Perspectives*, Vol. 110, No. 7, July 2002.

And then what about security and health costs.... Study sees 44,000 radiation deaths.

<<http://www.thejournalnews.com/newsroom/090804/b0108nukestudy.html>> A new study predicts that a Sept. 11-type terrorist attack on the Indian Point, New York nuclear power plants could result in 44,000 deaths from radiation poisoning and more than a half-million deaths over time from radiation-induced cancer in residents living within 50 miles of Buchanan. White Plains Journal News <<http://www.nyjournalnews.com>>, New York. <http://www.thejournalnews.com/newsroom/090804/b0108nukestudy.html> I might add, Are there similar health studies happening now around Pickering, Darlington or the Bruce nuclear reactors here in Ontario?

Just some thoughts and questions related to other ways of estimating and calculating the economic costs of ionizing radiation, nuclear power and health. I'll appreciate anyone's else's thoughts as well. We could certainly use this information in our campaigns.
Best wishes

Dorothy Goldin Rosenberg MES, PhD

I

>have two comments, one a follow up to the meeting and one a concern about
 >the DSF report:
 >
 >My first point relates to nuclear vs. conservation and renewables.
 >
 >Dorothy raised a comment during yesterday's meeting that I would like to
 >respond to. Capsulizing a long held response of the enviro
 >nmental community to
 >nuclear spending by utilities, I recollect that she remarked to the
 >effect
 >that nuclear investments use up dollars that could be spent on
 >conservation
 >and renewables and that therefore the bad was an alternative to the good.
 >If
 >my gloss is not correct please correct me. My response to this position
 >is
 >that the Bruce refurbishment contract does not involve the expenditure of
 >
 >either utility or government dollars. Instead the investment is being
 >made by
 >private non-utility parties ? TransCanada and OMERS. Bruce Power plays no
 >role
 >in conservation programming and only a cosmetic role renewables. The only
 >
 >financial connection between the Bruce A refurbishment on one hand and
 >conservation on the other hand is related to electricity prices. As my
 >Financial Post column from yesterday attempted to demonstrate, Bruce
 >juice
 >will likely prove to be expensive. Higher prices could encourage
 >consumers to
 >cut usage but it does not appear sensible or serious to suggest that
 >somehow
 >TransCanada/OMERS dollars earmarked for Bruce investments be redirected
 >somehow to conservation programs. Operationally, there is competition
 >between
 >Bruce vs. renewables, since the increasing non-dispatchable nuclear on
 >the
 >grid reduces room for wind power which is even less dispatchable than
 >nuclear.
 >Other than these remote relationships, I see no financial or operational
 >connection between Bruce vs. conservation and renewables.
 >
 >My second point relates to using hydroelectric generation to load shape
 >the
 >intermittent output of wind power.
 >
 >Norm noted that the DSF report ?Smart Generation: Powering Ontario with
 >Renewable Energy?, contains the following claim: "The province's
 >installed
 >dispatchable and storage-based hydroelectric facilities have many times

>the
>capacity to support and help integrate the proposed wind development [of
>8000
>MW]."
>
>I have some operational understanding of only a few of the major
>hydroelectric
>basins, but my understanding is that the dispatchability of these systems
>has
>been very thoroughly exploited and is also declining. One example is the
>Madawaska cascade which has one of the greatest proportional storage
>capacities of any of Ontario's cascades. A combination of factors have
>significantly cut the operational generation flexibility historically
>available from the Madawaska generators. Events contributing to the
>narrowing
>of its operating parameters include the tragic deaths of two local
>residents
>in June 2002 related to operation of the Barrett Chute spillway and the
>1995
>dry-out of the pickerel spawning beds in the tailrace area of the
>Mountain
>Chute generators. (The tailrace area is the only significant pickerel
>spawning
>site below Mountain Chute and above the next dam. Energy Probe played
>some
>role in promoting tougher Spring minimum flow requirements for Mountain
>Chute
>after the 1995 event.) As another example, I believe that since the low
>water
>conditions experienced in 2002, there are more restrictive operational
>constraints in place on the Mississauga cascade but my knowledge there is
>less
>detailed.
>
>The IESO has recently issued public statements expressing concern about
>declining operational flexibility of the hydroelectric fleet.
>
>The DSF report suggests that the Ontario Hydro/OPG and Brascan engineers
>don't
>know how to optimize the value of their hydroelectric systems. It would
>be
>helpful to have an explanation as to what that conclusion is based on
>from the
>authors of that section of the DSF report.
>
>Tom
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