THE PROBLEM WITH NUCLEAR IS THE ECONOMICS

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Secrecy and Subsidies

One of the reasons that a nuclear reactor has not been constructed in America for 30 years is the economics. Nuclear generation is not a self-sustaining industry and does not pay for itself. Uranium mining and nuclear generation began in the secrecy of wartime. The federal government supported uranium mining and provided exports of uranium for the Manhattan Project, and the production of the Hiroshima and Nagasaki bombs. (1)

Following this wartime episode, President Eisenhower advocated the "Atoms for Peace" program. In reality it proved a camouflage for the continuation of preparing nuclear weapons by the USA, which resulted in stockpiles of 10,000 Nuclear missiles.(2)

It also initiated a rush by several countries into nuclear generation of power which has resulted in about 430 reactors around the globe. There was great enthusiasm involved. This was a time when it was heralded by Lewis Strauss that nuclear electricity would be "too cheap to meter." This proved to be an illusion.

The Federal Government of Canada proceeded to grant subsidies to Atomic Energy of Canada Ltd. (AECL) for its experimentation and research projects (Chalk River experimental reactors and laboratories, and the Pinawa deep rock experimental cavern), and for the development of the CANDU reactors. Over the years, the AECL was funded by subsidies quietly approved by Cabinet, which were not debated or approved by Parliament. It has been calculated that these subsidies from 1953 to 2002, have totaled $17.5 billion dollars. (3)

Capital Investments

These nuclear reactors are huge, complex machines, which include massive shielding for the nuclear fission, complicated controls and robotic equipment, and safety switches and devices. And for cooling purposes, most of the Canadian CANDU's were built near the Great Lakes. For instance, reactors at Darlington, Ontario were estimated to take 3 years and $6 billion dollars to build. In reality, they required 12 years and $17 billion to construct. These huge figures are difficult for the average citizen to comprehend.

With the prospect of electricity shortages in the future, Ontario is now proposing to spend $40 billion dollars to build two new reactors at Darlington, and to refurbish half a dozen old reactors, for example:

Pickering A
unit 4- restart-- $1.4 billion
restart four units--$ 4 billion

Bruce A plants—
refurbish units 1 & 2-- $4.25 billion (4)

In addition, in 1997, a $1.5 billion loan was issued to the Chinese government so that it could buy a couple of CANDU reactors on a turnkey basis. (5)

Capital Debt

Ontario's 20 CANDU's were purchased in a nuclear buying spree in the 1960's and 1970's by Ontario Hydro. As a result, the construction of these reactors racked up $38 billion in debt. In 1999, when the provincial government separated Ontario Hydro into five different sections, and distributed some of the $38 billion debt among them, it left $19.4 billion of so-called "stranded debt." This is a new feature in fiscal accounting! Subsequently, every electrical bill in Ontario contains a "Debt Retirement Charge" (DRC). For a bi-monthly average of 1,800 kilowatts of electricity per household, that comes to $81 per year. (6)
How long do you think it will take to pay off $19.4 billion? And now Ontario is going to add new debt for its $40 billion worth of proposals for the future!

In 1995, Maurice Strong, then the chairman of Ontario Hydro, said "The utility's existing reactors have proved to be a poor financial investment. The 20 reactors have cost a total $30.8 billion, but they will only produce $18 billion worth of electricity during their lifetime." He also added, "I believe that nuclear energy, like any other source of energy, need to stand on its own economically… A merger is feasible, and there should not be a continuing need for government subsidy." (7)

Regarding the spending spree in the USA on nuclear reactors, the first generation of atomic reactors were labeled an "economic debacle," one that caused electric rates to soar in every part of the nation. The famous Forbes Magazine made the statement that, "The failure of the U.S. nuclear program ranks as the largest managerial disaster in business history, a disaster on a monumental scale." (8)

A recent article in Business Week states that although President Bush and the Utilities are proposing a new round of nuclear plants in the USA, Wall Street is skeptical about investing in a nuclear renaissance. "While smart money is placing multibillion dollar bets on ethanol, wind power, and solar, it is not throwing buckets of cash at nukes." Bob Simon, staff director of the Senate Energy and Natural Resources Committee is quoted as saying, "The real obstacle isn't the Sierra Club but the 28-year old analysts on Wall Street." (9)

Nuclear energy is not economical. It is poor business. If President Bush proceeds with his proposals, it sounds like it will be with government subsidies again, that is, money from the taxpayers, not from corporate investors.

Decommissioning Mysteries

The details above are about the construction and operation of nuclear reactors. No estimates are even available for the decommissioning of these plants. These costs have not been factored into the equation. After 20-30 years these reactors become worn out and unsafe. The pipes corrode and become brittle, the valves deteriorate, the electronics become worn.

After years of nuclear fission, they are tremendously radioactive. They will need to be dismantled by robotic means, and buried deep in the earth. No one has properly estimated the costs, or calculated how they are to be paid. That will be another legacy that we leave to our children and our grandchildren! (10)

We do know that the costs will be extreme. For instance, the Hanford Nuclear Reservation (a nuclear weapons plant) near Yakima, Washington, some seven miles from the Columbia River, has a dangerous collection of nuclear wastes. A vitrification plant is being proposed and planned for dealing with these wastes. In 2000 the estimated cost of construction was $4.3 billion, then in May of 2006 it was $11.55 billion, and in September of 2006 it was $12.2 billion.(11)

This was for radioactive wastes, not the highly radioactive machinery and core of nuclear reactors.

Economics of Alternative Sources of Energy

It appears that when the issue of "climate change" came to the attention of people, that it was real and already here, out of alarm and fear there was a stampede to the nuclear option by some people, and by some environmentalists.

However, there are alternative options and alternative economies available for our energy needs in the future. Germany and Denmark have made significant strides in the use of wind power especially, as well as other renewables. It is interesting to learn also that in Germany the wind power facilities are producing 14,000 megawatts (MW), nearly two-thirds of Ontario Power Generation's entire capacity, including nuclear reactors, coal plants, and Niagara Falls. These decentralized forms of renewable sources of energy also create more jobs in local communities. (12)

Denmark is now producing 3000 megawatts or 20% of the nation's electrical needs with wind power. (13) In California they have brought the cost of wind power down to 4 cents per kilowatt.(14) The National Energy Board of Canada says that wind power, now costs between $50 and $100 per megawatt/hour (MW/h), and expects that it will be down to $40 per MW/h by 2020. (15)

Fortunately, Saskatchewan has developed wind farms, the Cypress Wind Facility near Gull Lake (16 turbines for a capacity of 22 megawatts), and the Centennial Wind Facility near Rushlake Creek (83 turbines for a capacity of 150MW), enough to supply 73,000 homes or 5% of the province's total production.

Alberta also has large wind fields at Pincher Creek (100 turbines), Cowley Ridge (72 turbines), Castle River(60 turbines) and six small wind farms. The Federal Government will invest $900 million in wind projects over the next five years, with the goal of adding 4000MW to Canada's wind energy capacity. (16)
The Global Wind Energy Council announced that our Canadian wind-generating capacity reached the 1000 MW mark in June, and hopes to reach 9000 MW by 2015. Currently, wind turbines generate 59,000 megawatts globally, enough to power 18 million households. Worldwide revenues jumped from $11 billion (US) in 2004, to $25 billion (US) in 2005. (17)

Moreover, close to 40 million households worldwide now heat their water with solar panels. Solar panels now cover more than 400,000 rooftops in Japan, Germany, and the United States.(18)
Space and time are insufficient here to review the economics of many other additional sources of energy.

The economic features of nuclear power are unsatisfactory. The industry cannot survive on its own without government subsidies. This gives no incentive for private and corporate investors. David Freeman, former head of the California Power Authority, and head of two municipal utilities, stated: "Nuclear power had its chance and failed. You need huge subsidies before anyone will even talk about it." (19)

Endnotes—Sources of Information

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