



SASKATCHEWAN ENVIRONMENTAL SOCIETY

POSITION ON NUCLEAR POWER

The Saskatchewan Environmental Society has examined the option of using nuclear power as an electricity source for Saskatchewan and finds it to be an undesirable choice.

This conclusion is based on a review of the following factors:

- Economics
- Management of long-lived radioactive wastes
- Routine and accidental radioactive emissions
- Weapons and security
- Greenhouse gas emission reduction efficiency

It is concluded that better, safer and cheaper options for meeting our energy needs and for reducing greenhouse gas emissions are available.

1. ECONOMICS:

Nuclear reactor construction projects have a history of design problems and big cost over-runs that result in large public debt. Experience shows that either high electricity rates or significant government subsidies are required to make the nuclear choice a feasible option.

Canada subsidizes the cost of insurance for nuclear operations by limiting the legal liability of reactor owners to a very small fraction of the potential loss anticipated in the case of a major accident. The remaining damage would be paid for by the tax-payer. The future cost of

decommissioning a single reactor after its useful operating life will exceed two billion dollars.

2. RADIOACTIVE WASTES:

In the process of producing energy, a nuclear reactor transforms its uranium fuel into intensely radioactive waste that does not exist in nature. This used fuel contains the same deadly isotopes found in the fallout from nuclear bombs. There is no demonstrated safe way of disposing of it or of managing it securely for the necessary time period. Reprocessing of used fuel is energy-intensive, expensive, and hazardous. It creates additional security risks. Used fuel needs to be kept out of the environment for hundreds of thousands of years. The core of the reactor itself also becomes a bulky, hazardous, radioactive waste problem.

Lower-level radioactive wastes are also produced in significant quantity during reactor operations. Currently several Ontario communities are fighting a plan to bury such wastes close to Lake Huron. They fear that a drinking water source for millions of people will be contaminated.

3. ROUTINE AND ACCIDENTAL RADIOACTIVE EMISSIONS:

In their day to day operations nuclear power stations emit tritium and other radioactive materials into the environment. There is increasingly strong evidence linking these emissions to

childhood leukemia. Nuclear reactors also pose the remote risk of an extremely serious radiation accident. While such accidents are very uncommon, they are so catastrophic that they are uninsurable. If even one percent of the fission product material inside a reactor were released into Saskatchewan's environment, it would be catastrophic, making vast land areas unfit for living or farming due to radioactive contamination. With the critical exception of the Chernobyl disaster in Ukraine, such a severe accident has not happened in the nuclear power industry. However there have been other serious incidents that demonstrate the vulnerability of reactors, including a 1957 fire at the Windscale reactor in Cumbria, Britain which released a plume of radioactive debris, the Three Mile Island accident in Pennsylvania in 1979, and the failure of two of the four back-up generators at the Forsmark reactor north of Stockholm, Sweden during a power failure in 2006.

4. WEAPONS AND SECURITY:

While it may seem unlikely that the plutonium in nuclear fuel waste from a power reactor would currently be attractive to nuclear bomb-makers, it is clear that related parts of the nuclear fuel chain are vulnerable. If used fuel is re-processed, the plutonium becomes much more readily accessible. Uranium enrichment (required for most power reactors except the Candu) is universally recognized as a potential route to weapons-quality uranium. Depleted uranium left over from the enrichment process is currently used in conventional weapons, leaving low-level radioactive contamination scattered over battlefields. Used fuel can be used in "dirty bombs" –

conventional bombs that are loaded with nuclear fuel waste so that the target area becomes heavily contaminated. Because of these hazards, nuclear installations become of interest to terrorists and require extremely heavy security.

5. GREENHOUSE GAS EMISSIONS:

The Saskatchewan Environmental Society has re-examined the nuclear power option in light of the climate crisis and the need to drastically reduce greenhouse gas emissions. A top priority in Saskatchewan should be to phase out our coal-fired power stations. However, building nuclear reactors is an unwise way to try to accomplish this goal. Not only are they extraordinarily expensive to build, but nuclear power stations take 12 to 15 years to plan and construct, making this a very slow way to respond to climate change. Ironically, the Saskatchewan Government is not proposing nuclear power as a way to replace coal. Instead, serious consideration is being given to the concept of using nuclear power in addition to the coal-fired power plants. Then we would have the worst of both worlds – high levels of greenhouse gas emissions and a radioactive waste problem that lasts for ever.

Fortunately we have better options available.

AN ALTERNATIVE DIRECTION:

Electricity conservation and renewable sources of energy are far better choices than nuclear power. They offer proven, safe technologies that can be implemented much more quickly. Their cost can be forecast accurately and the fuel source is usually free. They leave no dangerous wastes for future generations

to contend with.

Saskatchewan has vast renewable electricity resources, but with the exception of our hydro dams and a small amount of wind power, we are not using them. To put this in context let us compare ourselves with Germany. Germany's government is truly committed to developing wind, solar and biomass-sourced electricity. Yet Germany's natural resources for accomplishing this are far inferior to Saskatchewan's. The wind speeds in Germany are lower. Solar energy doesn't work as well in Germany because it is so much cloudier than Saskatchewan. When it comes to biomass, the Germans have a much smaller forest resource. Despite these obstacles, the Germans, with their inferior natural resources, have been able to install more than 30,000MW of electrical capacity from wind, solar and biomass sources. They have done so while living in a total land area that is less than the size of southern Saskatchewan.

In contrast, Saskatchewan people only need 3,500 MW to meet all of our current power needs. 24% of these needs are already being met with our hydro resource and another 3% by wind. A large portion of the remainder could be met by building a decentralized network of large scale wind turbines across southern Saskatchewan and coordinating their use with small scale, low impact hydro development in northern Saskatchewan, hydro imports from Manitoba and electricity generation using our natural gas resources. Wind and hydro work nicely in combination to provide highly reliable base-load power and can be supplemented by natural gas when needed. The rest of our power

needs could come from other valuable base-load sources of low impact, non-polluting electricity including landfill gas in Saskatoon and Regina, waste heat recovery at every natural gas compressor station in Saskatchewan, use of waste wood chips for electricity generation in forest fringe communities, biogas development at hog barns and cattle feedlots, and expanded opportunities for co-generation of electricity in industrial facilities. Another valuable source of electricity in the medium term will come from the expansion of solar photovoltaic systems, as the price of solar PV is steadily dropping. At the same time, electricity storage systems are rapidly improving, making it possible to efficiently store and use an even larger proportion of the electricity produced from solar and wind power at all times of the day or night.

Another valuable electricity option for Saskatchewan people is electricity conservation and electricity efficiency. Manitoba Hydro has traditionally spent more than \$30 million per year on electricity efficiency, while SaskPower has traditionally spent less than \$1 million. Yet electricity efficiency is the cheapest and most cost effective source of electricity available to prairie people, costing less than 5 cents per kilowatt hour in contrast at least 12-15 cents per kilowatt hour for nuclear power. Windpower currently costs about 7 cents per kilowatt hour. A strong electricity conservation program could avoid increasing the power demand, and even reduce it, allowing an even greater proportion of our electricity to be met by renewable sources. This is the cheapest and most environment-friendly way to provide the electricity we need in order to maintain a comfortable lifestyle and a sustainable economy. Significant

additional power would be required only if we want to export it or use it for oilsands extraction.

The Saskatchewan Environmental Society supports a future in which both coal fired and nuclear powered electricity have been retired. The Society proposes that all of Saskatchewan's coal-fired power stations be phased out as they reach the end of their useful lifetimes, and that the nuclear power option be dropped as an outdated and dangerous technology. The billions of dollars that are currently being considered for retrofitting coal-fired generating stations and building a nuclear power station in Saskatchewan should instead be invested in electricity conservation and efficiency and in all the renewable energy technologies discussed above. Some of the money should also be invested in renewable electricity storage facilities and new transmission and grid capacity to facilitate use of distributed renewable sources of energy.

This position paper was written by Peter Prebble and Ann Coxworth and was adopted by the board of the Saskatchewan Environmental Society in 2009.



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