Environmental Impacts of Options for Producing Electricity
by Allen Frechette, Green Committee member

The most interesting duty of my career was preparing environmental review documents for proposed development. Minnesota has some of the best laws for protecting our environment and public health. Preparing an Environmental Assessment Worksheet or Environmental Impact Statement involves study of virtually every conceivable potential environmental impact that could result. This process gives policy makers a better understanding of the impacts before they approve permits for large projects.

Recently I was asked to participate in a panel of experts who had helped write or implement our state environmental laws. We shared our experiences with the newly appointed heads of state agencies and citizens who have been appointed by Governor Walz to the Minnesota Environmental Quality Board. That experience gave me an idea for this article.

The Environmental Review process for Environmental Impact Statements, done on major projects, involves looking at every conceivable environmental impact as well as alternatives. Since our understanding of impacts is often based on past experiences, this is an evolving process. As we learn more, our decisions get better. So it is with how we produce our electricity.

Humans started to advance technologically when we discovered we could produce electricity to power our machines, provide light and heat our buildings. How we do that has evolved through trial and error and relative cost. We are used to making decisions on the basis of cost vs. benefit, but we don't always have a good understanding of risks. The environmental review process is designed to discover as many risks as possible. Historically, by choosing to generate most of our electricity by burning coal we failed to understand the risks involved; risks that we now recognize will severely impact our children and grand children. We also chose to build light water based nuclear reactors before we had an environmental review process in law. Our decisions were primarily on the basis of cost to build and produce electricity as safely as we understood at the time. However, we failed to factor in the long term cost of storing the resulting nuclear waste. Costs which future generations must bear.

When nuclear energy was being studied and advanced during the middle of the last century, several technologies were identified. The decision to proceed with light water reactors was based likely on the lower cost for building the structures needed compared to some of the other options. But at the time, all of the options included finding and preparing the nuclear fuel needed. Now however, with tons of waste fuel rods from light water reactors available, which still contain more than 90% of the energy, several of the understood alternative technologies, which could use this waste, have become viable economic options. Unfortunately public opposition to nuclear energy is an obstacle.

When in college as a resident assistant at St. Cloud in the late 1960s, I was asked to take a weekend live-in training in fallout shelter management. Those fallout shelters, once maintained by our government for all major cities, have now almost all been abandoned and the stockpiles of survival supplies of medicines, bedding, food, water and radiation detection equipment have all been decommissioned and abandoned. But the fear of nuclear accidents has not been removed from society's mind. Our fear about nuclear accidents has even been funded by fossil fuel interests[1] who have contributed millions to environmental organizations like the Sierra Club that I've been a member of for almost 40 years. So changing the publics' opinion about next generation nuclear energy will be difficult.

1 http://environmentalprogress.org/the-war-on-nuclear

About ten years ago, I attended a presentation by a Scott County business owner, Joe Shuster, a chemical engineer who built a successful manufacturing company in New Prague. Joe was promoting his new book called "Beyond Fossil Fools" that proposed the need to transition to next generation nuclear energy. He proposed reconsideration of a known nuclear technology that could safely and economically generate electricity. His proposed "next generation" technology could recycle the waste fuel rods from the existing nuclear reactors, which otherwise require expensive storage for thousands of years. Joe estimated that the waste fuel rods could produce enough electricity for our nation's needs for the next 100 years without the need to mine anymore uranium. The remaining radioactive waste would be a fraction their original size and the resulting elements would be safe in several hundred years rather than tens of thousands as they are now. It sounded too good to be true. In addition this next generation technology had no risk of meltdown or radioactive release. I bought and read his book, now available free to download.[2] I also sent a copy to Dr. James E. Hansen, who as NASA's Director of the Goddard Science Division warned congress in 1988, of the impending threat of global warming. Dr. Hansen[3] wrote me back saying he fully endorsed this next generation nuclear energy as an important part of meeting our energy needs in the near future. He has also criticized[4] many of the environmental groups for taking money from fossil fuel interests and furthering public opposition to safe nuclear energy options.

What we need now is a generic Environmental Impact Statement examining the alternatives for meeting our energy needs based on science and not opinion. We need, as members of the public, to improve our understanding of the options and to influence our policy makers to base their decisions on informed science. There are many resources available to learn more including: Unintended Consequences[5] written by another Minnesotan and best-selling author, George Erickson, and a report by Yale Univeristy.[6]

2 http://www.thesciencecouncil.com/index.php/more-info/books-audio-video/beyond-fossil-fools
3 http://www.columbia.edu/~jeh1/publications.shtml
4 https://seekerblog.com/2015/09/10/james-hansen-on-antinuclear-environmental-groups/
5 https://tinyurl.com/yas7x2ok
6 https://e360.yale.edu/features/why-nuclear-power-must-be-part-of-the-energy-solution-environmentalists-climate