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April 20, 2023
Testimony
In Support of

LD 1549, "An Act to Direct the Public Utilities Commission to Seek Informational Bids Regarding Small Modular Nuclear Reactors in the State

Senator Lawrence, Representative Zeigler, and the distinguished members of the Joint Standing Committee on Energy, Utilities and Technology, my name is Reagan Paul and I represent House District 37 which includes the towns of Winterport, Prospect, Stockton Springs, Searsport, and part of Frankfort.

I am before you today to present my bill LD 1549, "An Act to Direct the Public Utilities Commission to Seek Informational Bids Regarding Small Modular Nuclear Reactors in the State."

After serving on this committee for a few months now, I am well aware of the mental anguish long wordy testimonies with no fun colored pictures can induce, so I will do my best to spare you all from that. Along with my testimony I have included colorful infographics to break it up a bit.

Nuclear Produces Less Carbon Pollution

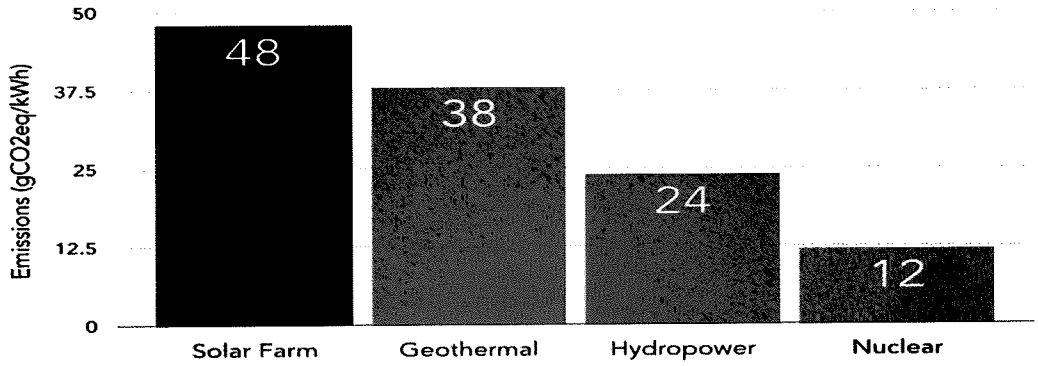
According to the Intergovernmental Panel on Climate Change (IPCC) data, solar farms produce four times more carbon pollution than nuclear power plants. For context, solar produces about 20 times less carbon than a coal-powered plant. Still yet, nuclear's carbon impact is a fraction of

solar. The process of uranium enrichment and fuel fabrication emits minimal carbon dioxide, and the operation of a nuclear power plant results in almost no emissions.

Nuclear Energy Is More Reliable and Has the Highest Capacity Factor

SMRs run around-the-clock (except for scheduled maintenance) power to fill the gaps when the sun isn't shining or the wind isn't blowing. This in turn increases grid security and stability. Fuel

Nuclear produces four times less carbon pollution than solar farms



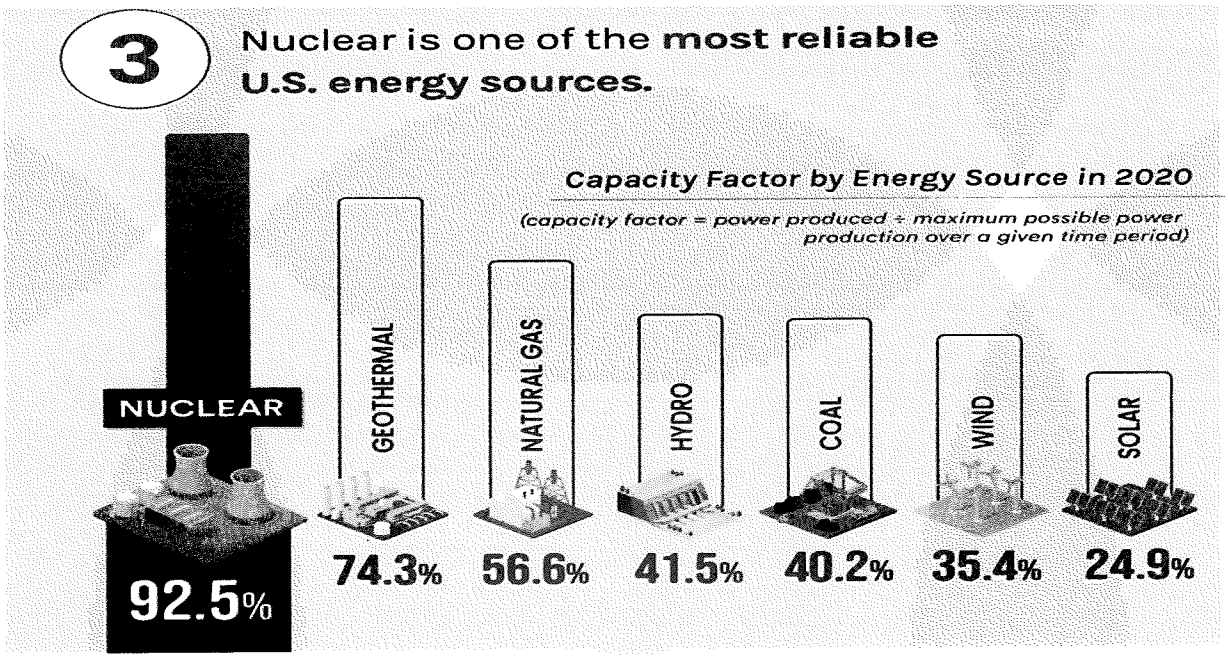
Source: Intergovernmental Panel on Climate Change (IPCC) 2014

Annex III Table A III.2 :: Schlömer S., T. Bruckner, L. Fulton, E. Hertwich, A. McKinnon, D. Perczyk, J. Roy, R. Schaeffer, R. Sims, P. Smith, and R Wiser, 2014. "Annex III: Technology-specific cost and performance parameters." In: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

ENVIRONMENTAL PROGRESS

can also be stored on site for a decade or more without the need for external supply.

Based on information from energy.gov, nuclear energy has an average capacity factor of 92.5%, compared to wind at 35.4% and solar at 24.9%.



According to the International Atomic Energy Agency (IAEA), SMRs also have reduced fuel requirements. Power plants based on SMRs may require less frequent refueling, every 3 to 7 years, in comparison to between 1 and 2 years for conventional plants. Some SMRs are designed to operate for up to 30 years without refueling.

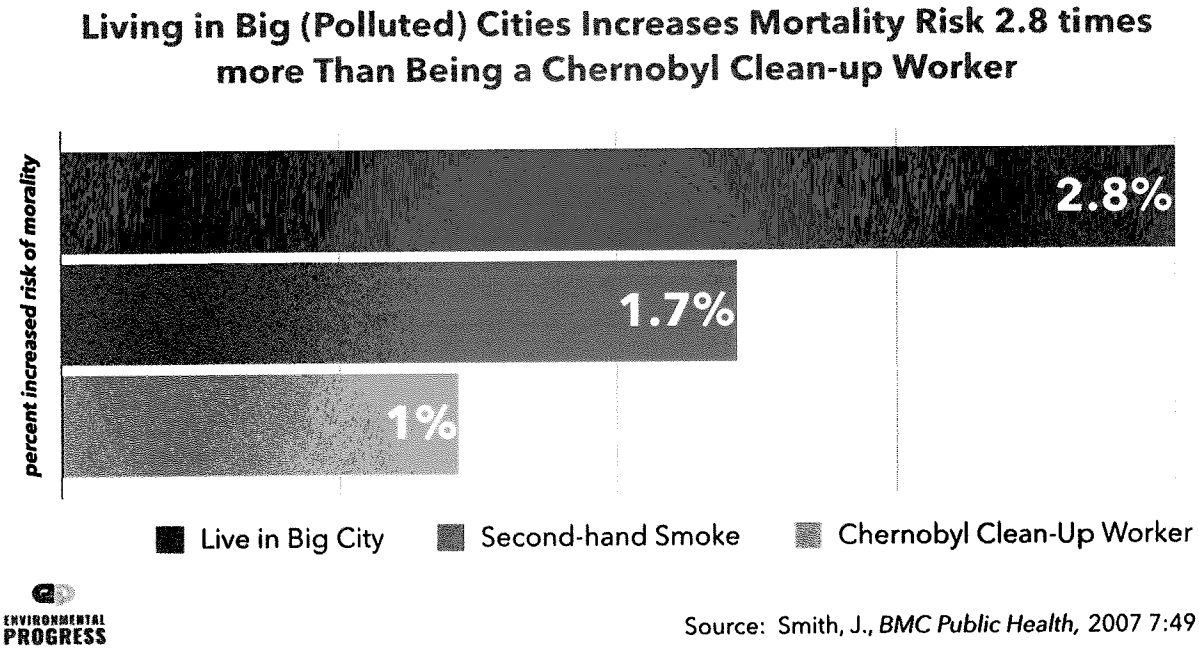
I want to remind the committee that this bill is just proposing an RFP.

SMRsTake Up Less Land

A nuclear energy facility also has a small area footprint, requiring about 1.3 square miles per 1,000 megawatts of installed capacity. (equivalent to about 3 small modular nuclear reactors). This figure is based on the median land area of the 59 nuclear plant sites in the United States. Taking the average capacity factors into account, a wind farm would need an installed capacity between 1,900 megawatts and 2,800 MW to generate the same amount of electricity in a year as a 1,000-MW nuclear energy facility. Such a facility would require between 260 square miles and 360 square miles of land. A solar PV facility must have an installed capacity of 3,300 MW and 5,400 MW to match a 1,000-MW nuclear facility's output, requiring between 45 and 75 square miles.For comparison, the District of Columbia's total land area is 68 square miles. The island of Manhattan is 34 square miles, and New York City's five boroughs (Manhattan, Brooklyn, Queens, Staten Island and the Bronx) take up 305 square miles.

Nuclear Is Not Dangerous

A common concern regarding nuclear technology is safety. A word that comes to the minds of many is Chernobyl. A lot of time has passed since that tragic event. Just like GM doesn't build Cadillac Eldorados anymore, nuclear technology has vastly improved since the 1970s. And it will keep improving.But, let's say it did happen again. With a little context, it is plain to see how these unfortunate events were not as dangerous as one may think. Environmental Progress is quick to point out that you are 2.8 times more likely to die from pollution in a big city than you are to die from radiation as a Chernobyl clean-up worker.



Also, many SMRs are constructed underground to make the reactors less vulnerable to extreme weather and physical attacks. SMR designs have the distinct advantage of factoring in current safeguards and security requirements. Most SMRs will be built below ground for safety and security enhancements, addressing vulnerabilities to both sabotage and natural phenomena hazard scenarios. Some SMRs will be designed to operate for extended periods without refueling. These SMRs could be fabricated and fueled in a factory, sealed and transported to sites for power generation or process heat, and then returned to the factory for defueling at the end of the life cycle. This approach could help to minimize the transportation and handling of nuclear material.

New Brunswick Power is working with Generation IV Plus Grid sized SMRs, which reduces the amount of nuclear waste generated from their operation as well as the amount of time it needs to be isolated from the environment. The technology being designed in New Brunswick can also reduce the amount of existing used fuel and convert it into a form of clean energy.

Economic Benefits

In addition to the environmental benefits, nuclear power provides certain economic benefits. In New Brunswick for example, they estimate that 750 jobs will be produced per year over 15 years. In addition, estimated $1 billion in GDP and $120 million in provincial government revenue.

Nuclear power also continues to be remarkably inexpensive. In 2019, the U.S. Energy Information Administration (EIA) estimated that the cost of electricity from new, advanced nuclear power plants coming online in 2023 to be 7.75 cents per kilowatt-hour before government subsidies. Current energy generation in Maine is nearly triple that cost.

SMRs also offer savings in cost and construction time and they can be deployed incrementally to match increasing energy demand.

Again, this bill is just asking for an RFP.

Nuclear Isn't Perfect. It's just better.

In the interest of your time and sanity, I will not get into the weeds regarding this innovative technology but, overall nuclear energy provides several benefits over other forms of energy generation. Its high capacity factor, low carbon emissions, and small footprint make it an attractive option for any state looking to reduce their reliance on fossil fuels and meet their energy needs cleanly and efficiently.

If the goal is truly to reduce carbon emissions, nuclear is the clear path forward. If Maine truly can't wait, we need to investigate this technology now.

Thank you for your time.