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MAINE CHAPTER

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To: Joint Standing Committee on Energy, Utilities and Technology
From: Sierra Club Maine
Date: March 13, 2025
Re: **Testimony in Opposition to L.D. 342: An Act to Include Nuclear Power in the State's Renewable Portfolio Standard; L.D. 343: An Act to Direct the Public Utilities Commission to Seek Informational Bids Regarding Small Modular Nuclear Reactors in the State; and L.D. 601: An Act to Remove State-imposed Referendum Requirements Regarding Nuclear Power**

Senator Lawrence, Representative Sachs, and members of the Joint Committee on Energy, Utilities and Technology,

I, David von Seggern of Westbrook, Maine, am testifying on behalf of Sierra Club Maine, representing over 22,000 supporters and members statewide. Founded in 1892, Sierra Club is one of our nation's oldest and largest environmental organizations. We work diligently to amplify the power of our 3.8 million members and supporters nation-wide. In line with Sierra Club energy policy, we urge you to recognize the severe complications and hazards of nuclear power generation and oppose L.D. 342, L.D. 343, and L.D. 601.

The Sierra Club policy language on nuclear energy is clear:[1]

> *The Sierra Club opposes the licensing, construction and operation of new nuclear reactors utilizing the fission process, pending:*
> 1. *Resolution of the significant safety problems inherent in reactor operation, disposal of spent fuels, and possible diversion of nuclear materials capable of use in weapons manufacture.*
> 2. *Establishment of adequate regulatory machinery to guarantee adherence to the foregoing conditions.*
>
> *Further, the Sierra Club supports the systematic reduction of society's dependence on nuclear fission as a source of electric power and recommends a phased closure and decommissioning of operating commercial nuclear fission electric power reactors.*

Specific reasons to oppose these bills are given below in subsections addressing the several problems of nuclear power generation.

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[1] Sierra Club, Nuclear Power Policy. https://www.sierraclub.org/policy/energy/nuclear-power

Unsolved Nuclear Waste Disposal:

In the 1950s the idea of the peaceful atom was born, leading to the development of reactors that could generate nuclear power for the nation. However, from the beginning, the ultimate disposal for the extremely hazardous products, called high-level waste (HLW), of this power production was given too little attention. Today, we have in the US no permanent solution for the storage of this HLW. We firmly hold that no licensing of new nuclear power reactors, small, medium, or large, should take place until a permanent solution for the inevitable HLW is implemented.

The Government Accountability Office reports that as of 2022, the US had 90,000 metric tons of commercial HLW sitting at roughly 70 sites around the country.[2] None of this HLW is now confined in what is considered a permanent manner. As time progresses, the risk involved with these sites grows. And the cost continues to mount up in storage fees paid by the Federal government, according to the same GAO report which says this unsolved problem may cost billions in the future in fees alone.[3]

The 64 casks of HLW on the peninsula south of Wiscasset, Maine, site of the decommissioned Maine Yankee nuclear power plant, are a stark reminder to Mainers that the nuclear waste problem is not solved. They lie roughly 30 feet above mean sea level, and may be threatened by rising sea levels in the years ahead.

Over the years, many attempts have been made to create a permanent repository for the nation's commercial HLW. It began with the 1982 Nuclear Waste Policy Act.[4] A 1987 amendment resulted in the designation of Yucca Mountain, Nevada, as the site of the permanent geologic repository.[5] Yucca Mountain was the target of a broad and intensive, 20-year, scientific investigation for its suitability as the repository, but the project was effectively mothballed in 2010 by the elimination of funding. In addition to scientific uncertainties about the containment of HLW permanently, political resistance from the State of Nevada was continuous and effective. Subsequently, efforts have focused on "interim" HLW storage facilities, but these are subject to many of the same scientific and political hurdles that Yucca Mountain was subjected to. At this moment in March 2025, we have an interim facility in Andrews, Texas, that has been given a license by the Nuclear Regulatory Commission (NRC), which license is now under the scrutiny of the Supreme Court of the US.[6] A decision in this case will likely not come out until mid-year. Elsewhere, other than in Texas, citizens and government units have

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[2] US Government Accountability Office. https://www.gao.gov/nuclear-waste-disposal

[3] *Ibid.*

[4] Nuclear Waste Policy Act (1982). https://www.congress.gov/bill/97th-congress/house-bill/3809

[5] H.R.3430 (1987). https://www.congress.gov/bill/100th-congress/house-bill/3430

[6] US Nuclear Regulatory Commission et Al. v. State of Texas, et al. https://www.supremecourt.gov/DocketPDF/23/23-1300/314852/20240612144746118_NRC_Pet_f.pdf

resisted interim HLW storage. The question here is not whether Maine seeks to have such a HLW storage facility but whether the HLW from Maine nuclear reactors, either past or future, will have a place out-of-state to which Maine can send its commercial HLW for permanent storage. We maintain that, because no such place now exists nor is fully cleared legally for the future, the State of Maine should not be considering any approval for future nuclear power generation within our state. These bills, L.D. 342, L.D. 343, and L.D. 601, are attempting to approve exactly that.

Why turn to nuclear energy when we have mature solar and wind industries whose power generation can only be described as benign in relation to the risks of nuclear power generation? The nuclear accidents at Chernobyl (1986) in the former Soviet Union and here in the US at Three Mile Island (1979) sent shock waves through the industry and the public. The catastrophic accident most recently in 2011 at the Fukushima nuclear facility in Japan is estimated to have cost $180B[7] (US dollars) to clean up. We need not take these risks and then have the problem of how to dispose of the waste products of nuclear power generation when the sun and the wind are abundant and ready to provide Maine's needed power, even at nearly a baseload level if we combine them with battery-storage facilities. That means that wind and solar generation, along with the use of energy stored in batteries, can replace the steady power supply that was once the main reason to use nuclear, coal or oil-fired power plants to cover most electric energy demand and natural gas or oil-fired "peaker" plants to quickly add more supply to meet peak demand at some points in the 24-hour day.

The issue of proper and safe disposal of spent nuclear fuels continues to call into question whether nuclear energy is a clean energy source, and this is the principal reason for our Chapter's opposition to L.D. 342, L.D. 343, and L.D. 601.

Expensive:
The Levelized Cost of Energy (LCOE) for nuclear power is clearly higher than that of wind and solar power.[8] Nuclear energy has always been plagued by high costs that require massive government subsidies. One of these subsidies is actually a dangerous cap on financial liability (of a sort that almost no other industry has) which is provided by federal law (Price-Anderson Act, 1957) and without which nuclear power plants would probably not be able to compete at all in the energy market.[9] The law established accident liability limits for the nuclear industry and a mechanism to ensure that damage compensation to the public would be readily available within those limits. The amounts

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[7] Japan Fukushima nuclear plant clean-up costs double, BBC News, 28 November 2016. https://www.bbc.com/news/world-asia-38131248

[8] Lazard LCOE, June 2024, https://www.lazard.com/media/xemfey0k/lazards-lcoeplus-june-2024-_vf.pdf

[9] Congressional Research Service, Price-Anderson Act: Nuclear Power Industry Liability Limits and Compensation to the Public After Radioactive Releases. https://crsreports.congress.gov/product/pdf/IF/IF10821

available from the federal insurance program under Price-Anderson however are far less than the $180B (US dollars) in damages caused by the Fukushima disaster.

Load Following:

Not only are nuclear reactors expensive to build, but they have difficulty partaking in load-following when electricity demand fluctuates. As of 2023, nuclear reactors in the US had not shown the ability to load follow:[10]

> *Operational inflexibility: In a world with renewables, load following (altering power plant output based on fluctuations in demand for electricity) will be key. No nuclear reactor in the United States has demonstrated the technical capability to load follow, nor demonstrated economic viability when operating at less than maximum capacity.*[11]

Thus, the overall value of SMRs may be limited in a rapidly diversifying energy market.

Dangerous:

The same safety risks, waste management, and nuclear weapons proliferation issues plague SMRs as traditional, large-scale nuclear power plants.

- A peer-reviewed 2022 study published in the Proceedings of the National Academy of Sciences (PNAS) showed that three designs for SMRs would increase the volume of nuclear waste in need of management by a factor of 2 to 30 times more than traditional reactors.[12]
- SMRs further deepen our dependence on uranium mining, which poses its own set of environmental and safety problems, disproportionately impacting indigenous communities.
- Nuclear plants are highly susceptible to hacking.[13] It has already happened in the UK, as reported:[14]

  Sellafield nuclear site hacked by groups linked to Russia and China "Exclusive: Malware may still be present and potential effects have been covered up by staff, investigation reveals 'Bottomless pit of hell, money and despair' at Europe's most toxic nuclear site – Sellafield has leak that could pose risk to public.

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[10] Natural Resources Defense Council. (2023, December). Small modular nuclear reactors - more questions than answers. https://www.nrdc.org/sites/default/files/2023-12/small-modular-nuclear-reactors-ib.pdf

[11] *Ibid.*

[12] Krall, L. M., Macfarlane, A. M., & Ewing, R. C. (2022). Nuclear waste from small modular reactors. *Proceedings of the National Academy of Sciences*, *119*(23). https://doi.org/10.1073/pnas.2111833119

[13] Wikipedia, *Vulnerability of nuclear facilities to attack*. https://en.wikipedia.org/wiki/Vulnerability_of_nuclear_facilities_to_attack

[14] The Guardian, 4 December 2023, *Sellafield nuclear site hacked by groups linked to Russia and China*. https://www.theguardian.com/business/2023/dec/04/sellafield-nuclear-site-hacked-groups-russia-china

Slow:
We need clean energy solutions that respond to growing demand for energy now, not in a decade or more. At this time, there is only one SMR design (NuScale Power) that has received certification from the NRC.[15] Commercial power plants using such a design can follow, but they must undergo a separate licensing procedure which typically involves years of scrutiny to ensure safety and often reveals problems not known at the start of proceedings. The nuclear power industry's track record in bringing nuclear power plants online in a timely manner is dismal. Lazard's Levelized Cost of Energy report shows utility scale solar can be built in 9 months while nuclear reactors may take 69 months or more.[16] That's build time, not including permitting approvals which can take additional years to secure. The latest US nuclear reactors, brought online in Georgia in 2024, were started in 2009.[17] Although SMR facilities may run a shorter cycle, there is little reason to believe that the NRC and the DOE will significantly lighten their licensing burden.

Diversionary:
Lastly, we point out that, when regulatory bodies and legislatures are busy focusing on nuclear, they are not passing laws and approving permits for solar, wind, battery storage, energy efficiency and more solutions that are ready to implement today. Claims that SMRs are safer, cleaner, and cheaper have not been proven in the real world, where cost overruns have already canceled projects involving them. While billions are invested to prop up unproven technology, we are losing precious time to roll out proven solutions for our energy transition. And, importantly, no SMR designs have entered commercial use, making any legislative action to encourage SMRs for use in Maine premature and, in fact, dangerous.[18]

For the above reasons, we encourage the committee to oppose L.D. 342, L.D. 343, and L.D. 601 and focus efforts instead on real, attainable solutions to our clean-energy transition.

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[15] NRC Certifies the First US Small Reactor Design, US Dept. of Energy, https://www.energy.gov/ne/articles/nrc-certifies-first-us-small-modular-reactor-design
[16] Lazard. (2024, June). Levelized cost of energy. https://www.lazard.com/research-insights/levelized-cost-of-energyplus/
[17] US Energy Information Administration. https://www.eia.gov/todayinenergy/detail.php?id=61963
[18] US Dept. of Energy, *Significant technology development and licensing risks remain in bringing advanced SMR designs to market*…. https://www.energy.gov/ne/advanced-small-modular-reactors-smrs