Natural Resources Council of Maine
3 Wade Street • Augusta, Maine 04330 • (207) 622-3101 • Fax: (207) 622-4343 • www.nrcm.org

Testimony in Opposition to
LD 342, An Act to Include Nuclear Power in the State's Renewable Portfolio Standard,
LD 343, An Act to Direct the Public Utilities Commission to Seek Informational Bids Regarding Small Modular Nuclear Reactors in the State, and
LD 601, An Act to Remove State-imposed Referendum Requirements Regarding Nuclear Power

To the Committee on Energy, Utilities and Technology
by Jack Shapiro, Climate and Clean Energy Program Director
March 13, 2025

Senator Lawrence, Representative Sachs, members of the Energy, Utilities and Technology Committee, my name is Jack Shapiro, and I am the Climate and Clean Energy Director at the Natural Resources Council of Maine (NRCM). NRCM is a nonpartisan membership organization that has been working for more than 65 years to protect, restore, and conserve Maine's environment, now and for future generations. On behalf of our nearly 24,000 members and supporters, I'm here today to testify in opposition to LD 342, An Act to Include Nuclear Power in the State's Renewable Portfolio Standard; LD 343, An Act to Direct the Public Utilities Commission to Seek Informational Bids Regarding Small Modular Nuclear Reactors in the State; and LD 601, An Act to Remove State-imposed Referendum Requirements Regarding Nuclear Power.

Climate change is one of the greatest threats to Maine's woods, waters, wildlife, coasts, and communities, and we are already seeing its impacts. As laid out in Maine's climate action plan, our core strategy to reduce the dangerous carbon pollution that causes climate change is by replacing its uses – in transportation fuels, in heating fuels, and in power generation – with alternatives, which often come with other benefits, including reduced air pollution and better health outcomes, reduced fuel and energy costs, and jobs and economic growth.

Nuclear power is part of this conversation about Maine's energy future, and it's helpful to separate the issue into two distinct things: existing nuclear and new nuclear, and to talk about the issue in concrete terms for Maine and New England.

New England has two currently operating nuclear plants – Millstone in Connecticut and Seabrook in New Hampshire – and it may make sense to keep those facilities operating to provide low-carbon electricity to the regional grid as we build up our renewable capacity as a state and a region. We should look at what Maine's role and policy options are to do that, and we expect to do so when legislation to implement Governor Mills' goal of 100% clean energy by 2040 is printed.

However, it does not make sense for Maine to pursue *new* nuclear for several reasons:

- Nuclear is an extraordinarily expensive source of electricity compared to the current and rapidly declining costs of renewables.
- The nuclear industry has a dismal and high-risk track record of catastrophic budget overruns and production delays.
- Building new nuclear will not occur in time to meaningfully contribute to emissions reductions, while renewables are being rapidly deployed today.
- Nuclear involves significant risks – including accidents, proliferation risks, and the creation of long-lived radioactive waste – that do not exist for our other alternatives.

Recent nuclear projects follow a pattern of high costs, delays, and budget overruns

Nuclear is an extremely expensive source of power. The two most recent nuclear construction projects in the United States are helpful examples. The VC Summer project in South Carolina, started in 2013, was abandoned in 2017 after spending $9 billion in ratepayer money that those ratepayers are still paying for today.[1] Ratepayers in South Carolina today are paying the costs of that failed project. The Vogtle project, two reactors constructed in Georgia, came online seven years late at a total cost of $35 billion — $21 billion over budget.[2] This pattern is not unique to these projects. One peer-reviewed study looked at 180 nuclear projects worldwide and found that only five of those projects met anticipated cost and time targets. The rest took an average 64% more time than projected and exceeded initial budgets by 117%.[3]

Civilian nuclear projects also rely on legislation placing the vast majority of the liability risk for nuclear accidents on taxpayers instead of private developers or operators. The liability for a nuclear plant operator in the event of a nuclear accident is capped at $16.2 billion.[4] For a sense of scale of the public

[1] South Carolina Daily Gazette. *Here's how much SC power customers are still paying for a failed nuclear project.* April 5, 2024. https://scdailygazette.com/2024/04/05/heres-how-much-sc-power-customers-are-still-paying-for-a-failed-nuclear-project/

[2] AP News. *A Second New Nuclear Reactor Is Completed in Georgia. the Carbon-Free Power Comes at a High Price.* April 29, 2024. https://www.usnews.com/news/business/articles/2024-04-29/a-second-new-nuclear-reactor-is-completed-georgia-the-carbon-free-power-comes-at-a-high-price

[3] Sovacool et. al. *An international comparative assessment of construction cost overruns for electricity infrastructure.* Energy Research & Social Science. September 2014. https://www.researchgate.net/publication/265731318_An_international_comparative_assessment_of_construction_cost_overruns_for_electricity_infrastructure

[4] Congressional Research Service. *Price-Anderson Act: Nuclear Power Industry Liability Limits and Compensation to the Public After Radioactive Releases.* Updated February 28, 2025. https://www.congress.gov/crs-product/IF10821

subsidy, the damage from the 2011 Fukushima accident is estimated at $200-$300 billion.[5] The damage from the 1986 Chernobyl accident is estimated at $700 billion.[6]

Nuclear compares unfavorably to renewables

U.S. nuclear capacity has been stagnant since the late 1980s, at around 100 GW of capacity.[7] Renewable energy sources in contrast are growing rapidly. Clean energy capacity in the U.S. reached 313 GW last year, with 100GW of capacity installed in just the past three years alone (2022-2024).[8] Unlike renewable energy resources, which have seen dramatic cost reductions in recent years, nuclear power has actually increased in cost over the same timeline.[9]

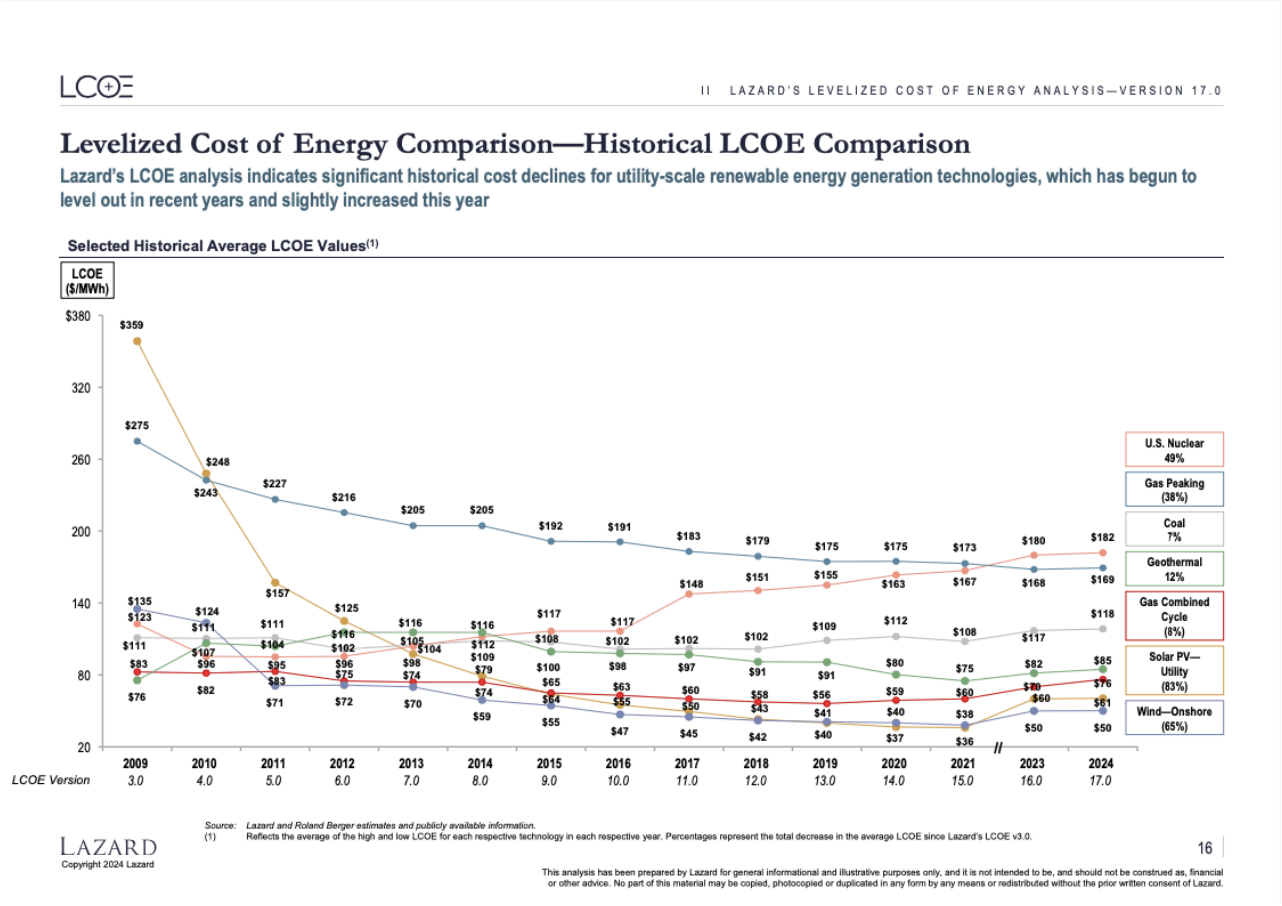
[5] Cancer History Project. *The Fukushima Daiichi nuclear accident: 10 years later.* March 19, 2021. https://cancerhistoryproject.com/article/the-fukushima-daiichi-nuclear-accident-10-years-later/

[6] University of Southern California. *New report examines financial costs of the Chernobyl nuclear power plant disaster.* May 24, 2016. https://globalhealth.usc.edu/2016/05/24/the-financial-costs-of-the-chernobyl-nuclear-power-plant-disaster-a-review-of-the-literature/

[7] U.S. Energy Information Administration. *Nuclear Explained.* Updated August 24, 2023. https://www.eia.gov/energyexplained/nuclear/us-nuclear-industry.php

[8] American Clean Power Association. *NEW REPORT: Clean Energy Dominates in 2024.* March 5, 2025. https://cleanpower.org/news/market-report-2024-snapshot/

[9] Lazard. *Lazard Levelized Cost of Energy Version 17.0*. June 2024. https://www.lazard.com/media/xemfey0k/lazards-lcoeplus-june-2024-_vf.pdf



Source: Lazard

Small modular reactors (SMRs) are more expensive per unit of energy and have other drawbacks

Small modular reactors, or SMRs, are more expensive than large reactors per unit of energy. While the capital cost of a smaller reactor is lower, it by definition will generate less energy. Many of the costs of nuclear plant construction are fixed and do not scale down evenly with a lower capacity project, including, for example, construction costs, fuel costs, staff costs, and security costs.

The main argument for SMRs is that costs could eventually be driven down through mass production, but as those learning curves would require the construction of dozens or hundreds of identical reactors, those theoretical cost reductions are likely illusory, especially in competition with the rapidly expanding renewable power sector, which has demonstrated its ability to reduce costs over time. Two current SMR projects in the U.S. illustrate the enormous economic gap SMRs will have to span if they are to compete with renewable energy. TerraPower's Natrium reactor is estimated to have an installed cost over $26,000/kW. The NuScale UAMPS project's total cost projection when it was cancelled was $9.3

billion or $20,000/kW.[10] In contrast, 2023 average installed costs in North America for wind power were $1,484/kW, and solar were $1,109/kW.[11]

SMR projects around the world have experienced the same ballooning cost estimates and delays that have plagued other nuclear projects.[12] Further, most SMRs use reactor designs that are novel and untested, raising significant questions about safety, security, and environmental risks.[13]

Maine Yankee – Economics, decommissioning, and ongoing waste obligations

Maine's experience with the Maine Yankee nuclear plant is instructive regarding the competitiveness of nuclear power plants and the long tail of obligations associated with nuclear waste disposal.

Maine Yankee was an approximately 900MW commercial nuclear plant that operated between 1972 and 1996. The decision was made to decommission the plant in 1997. A comprehensive review of the decommissioning process makes it clear that the decision to close Maine Yankee was primarily an economic decision, but one driven by a series of operational and safety problems that made it uncompetitive and too expensive to continue operating economically.[14]

Since Maine Yankee's decommissioning, 550 metrics tons of waste, including 1,400 spent nuclear fuel rods and other irradiated steel housed in 64 cement and steel canisters remain at the site in Wiscasset.[15] While this radioactive waste doesn't pose an immediate risk to surrounding communities, the waste will remain dangerous, if disturbed, for tens of thousands of years if not longer. Permanent storage solutions for nuclear waste have been promised but have not materialized, and there is no prospect for a politically, economically, and technically viable permanent solution on the horizon. Any new nuclear facility would confront the same issues.

Currently, Maine Yankee waste requires the presence of armed guards around the clock at an expense to taxpayers of $10 million per year. Notably, this cost is borne by taxpayers, not the commercial operators

[10] World Nuclear Industry Status Report. *World Nuclear Industry Status Report 2024.* September 2024. https://www.worldnuclearreport.org/IMG/pdf/wnisr2024-v2.pdf

[11] International Renewable Energy Agency. *Renewable power generation costs in 2023.* 2024. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2024/Sep/IRENA_Renewable_power_generation_costs_in_2023.pdf

[12] See testimony from David Schlissel, Schlissel Technical Consulting.

[13] Union of Concerned Scientists. *"Advanced" Isn't Always Better: Assessing the Safety, Security, and Environmental Impacts of Non-Light-Water Nuclear Reactors.* March 2021. https://www.ucs.org/sites/default/files/2021-05/ucs-rpt-AR-3.21-web_Mayrev.pdf

[14] EPRI and Maine Yankee. Maine Yankee Decommissioning Experience Report: Detailed Experiences 1997 – 2004. 2005. https://maineyankee.com/docs/my%20epri%20report-2005.pdf

[15] Bangor Daily News. *"Armed guards protect tons of nuclear waste that Maine can't get rid of."* Updated August 1, 2023. https://www.bangordailynews.com/2021/07/19/midcoast/armed-guards-protect-tons-of-nuclear-waste-that-maine-cant-get-rid-of/

of the nuclear plant, another demonstration of the extraordinary government subsidization of risk that the nuclear industry has long enjoyed.

LD 342

LD 342 would add nuclear facilities constructed after January 1, 2025, to the list of eligible resources for Maine's renewable portfolio standards (RPS).

> *Nuclear energy is not renewable*
> While nuclear energy does not produce direct carbon dioxide emissions, which are the primary cause of climate change, nuclear fission relies on mined uranium fuels, which have their own impacts from resource extraction, and creates wastes that are dangerous for tens of thousands, even hundreds of thousands of years.
>
> *Proposed Clean Energy Standard*
> The Governor's Energy Office's recent *Pathways to 2040* study, suggests adopting a Clean Energy Standard (CES) approach to adding additional carbon-free resources to Maine's energy supply.[16] Other states have adopted this approach. Clean resources in this context are those that don't emit carbon emissions – like nuclear – but are not considered renewable. We understand a bill is being drafted to implement a CES this session, but it has not yet been printed. Our view is that that is the best place to consider the appropriate way to include nuclear energy in Maine's energy mix.

Because nuclear power is not renewable, because new nuclear power is not likely to be constructed in New England, mostly for economic reasons as described above, and because other bills will come before this committee addressing this topic, we urge the Committee to oppose this bill.

LD 343

LD 343 would direct the Maine Public Utilities Commission (PUC) to solicit informational bids every year for an SMR in Maine. SMRs are: 1) prohibitively expensive; 2) if contracted entail significant risks of cost overruns and construction delays; and 3) due to the timelines of permitting and construction, are not likely to a contribute to Maine's need for affordable, reliable, and clean energy. Now is not the time to require an annual solicitation for what is clearly an immature and risky technology. We urge the Committee to oppose this bill.

LD 601

LD 601 removes the requirement that nuclear power plants, waste disposal or storage facilities, and waste disposal agreements be approved by referenda. This section of law begins by stating that: "The

[16] Governor's Energy Office. Maine Pathways to 2040: Analysis and Insights. January 2025. https://www.maine.gov/energy/sites/maine.gov.energy/files/2025-01/Maine%20Pathways%20to%202040%20Analysis%20and%20Insights.pdf

Legislature finds that construction of a nuclear power plant is a major financial investment, which will have consequences for consumers for years to come."[17] This is as true today as it was the day this passage became law, and the same could be said for the generation of nuclear waste, which creates breathtaking waste stewardship obligations and expenses, as we are currently still contending with in Wiscasset. There is no current justification for removing these requirements, unless there is a new nuclear power facility planned for Maine, but as outlined above, Maine should not pursue new nuclear power projects and instead should redouble our efforts to build out Maine-made renewable energy resources to diversify our energy supply, reduce our dependence on out-of-state fossil fuels, create jobs and economic opportunity, and reduce pollution. We urge the committee to oppose this bill.

Thank you for the opportunity to testify on these three bills.

I would be happy to answer any questions the committee has.

[17] MRSA Title 35-A, §4301. https://legislature.maine.gov/statutes/35-a/title35-Asec4301.html