

Thank you, madam chair, and members of the Committee. My name is Dr. Patrick White, and I am a Project Manager with the Nuclear Innovation Alliance – a non-profit, non-partisan think-and-do-tank focused on creating the conditions for success for advanced nuclear energy as a climate solution. I appreciate the opportunity to provide comments on Senate Bill 73 and on small modular reactors more broadly.

Small modular reactors (or SMRs) are a potential paradigm shift for the use of nuclear energy here in Colorado, nationwide, and around the world. While conventional light water nuclear reactors currently in operation in the United States produce reliable carbon-free energy and are safe to operate, they are also large, capital-intensive, baseload electric generation units. These characteristics may limit their ability to integrate into future energy systems with large percentages of variable renewable energy sources and the need to provide reliable carbon-free energy for heating, transportation, and industrial processes.

SMRs are a nimbler approach to carbon-free nuclear energy. These SMR may leverage existing light water reactor technology or other advanced reactor technologies, each with unique safety and operational attributes. Some examples of non-light water technologies currently under development for SMRs include high temperature gas reactors and sodium fast reactors.

These SMRs are obviously smaller than conventional nuclear reactors but this reduced size has several significant operational and safety advantages. The smaller size and a focus on flexible operations allows SMRs to effectively match changing energy demands and renewable energy generation throughout the day without the need for large amounts of energy storage. Numerous academic studies have found that including “firm” clean energy sources like SMRs can significantly reduce the average cost of energy from 100% clean energy systems.

Smaller reactors also enable modular addition of nuclear energy capacity that can more efficiently meet the increasing energy needs of communities over time. Their size and modularity of these new reactors enable the factory manufacturing of reactor modules and can reduce the time needed on-site for construction and installation as compared with conventional nuclear energy.

The smaller reactor size and developer emphasis on inherent safety may simplify the siting requirements for SMRs and reduce the burden on surrounding communities. Advanced reactors are subject to review by the Nuclear Regulatory Commission and will meet or outperform the safety standards for nuclear energy in the United States. Finally, while we tend to focus on decarbonizing our electricity sector, decarbonizing all major energy uses will be needed to help mitigate climate change. SMRs can help provide clean, reliable, carbon-free energy, heat, and electricity to a wide variety of energy sectors including residential, commercial, industrial, and transportation historically powered by natural gas or other fossil fuels.

SMRs could readily integrate with solar, wind, hydroelectric, and other zero-carbon sources as part of broader clean energy strategy in Colorado. A variety of potential advanced reactor technologies are currently under development by companies across the United States and will be ready for commercial deployment by the end of this decade. The SMR feasibility study in Senate Bill 73 will help provide Coloradans with more information on how SMRs could help supply the state with safe, clean, reliable, and affordable energy.