NARUC-NASEO Nuclear Resources

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Author	Title / Description	Date	Length
General Information on Advanced Nuclear Energy's Role and Potential for Growth			
National Association of Regulatory Utility Commissioners and National Association of State Energy Officials	Developing State Advanced Nuclear Energy Strategic Frameworks: Guidance for State Energy Offices and Public Utility Commissions • Assist public utility commissions and State Energy Offices preparing to lead and/or contribute to the development of a strategic framework for new nuclear energy generation projects in their states • Summarizes suggested steps for developing a strategic framework, discusses factors for states to explore, and offers considerations for integrating an advanced nuclear energy strategic framework with other state processes	June 2025	34 pages
U.S. Department of Energy	Pathways to Commercial Liftoff: Advanced Nuclear • Foundational report from DOE looking at challenges and strategies for the advanced nuclear sector • Update to 2023 report, incorporates impacts of load growth and R&D milestones in the advanced nuclear sector • Provides steps for public and private sector entities to achieve NOAK cost reductions	Sept. 2024	83 pages
Prepared for the National Association of Regulatory Utility Commissioners by Energy Ventures Analysis	Nuclear Energy as a Keystone Clean Energy Resource • Nuclear energy's contribution to clean electricity • Recommendations for state regulators and policymakers to retain and advance nuclear generation	Aug. 2022	60 pages

Gateway for Accelerated Innovation in Nuclear (Idaho National Lab, Argonne National Lab, Massachusetts Institute of Technology, Breakthrough Institute)	Meta-Analysis of Advanced Nuclear Reactor Cost Estimations • Most recent available estimate of cost ranges of advanced nuclear for use in decision-making and energy planning • Based on public information • Includes estimates for large and small reactor sizes from first-of-a-kind to *Nth*-of-a-kind	April 2024	181 pages

Idaho National Lab, Argonne National Lab, Massachusetts Institute of Technology	A Tool to Quantify Capital Cost Reduction Pathways for Advanced Nuclear Reactors • Overview of a capital cost reduction tool and accompanying report • Attempts to relatively quantify specific pathways towards capital cost reduction of advanced reactors • Discusses assumptions, framework inputs, and output overviews	June 2024	4 pages
Prepared for the U.S. Department of Energy by the National Reactor Innovation Center, Gateway for Accelerated Innovation in Nuclear, and Idaho National Lab	Nuclear Energy Supply Chain Deep Dive Assessment • Description of current and future roles for nuclear energy in the U.S. and abroad, segments of the nuclear energy supply chain, and risks	Feb. 2022	60 pages
Nuclear Energy Institute	State Legislation and Regulations Supporting Nuclear Energy • Periodically updated list of state legislative actions in support of nuclear	Jan. 2025	25 pages
Prepared for the U.S. Department of Energy by Argonne National Lab and Idaho National Lab	Factors Impacting Nuclear Energy Share in U.S. Energy Markets • Collates information and findings from recent studies conducted by national and international entities to identify approaches for maintaining	Aug. 2020	60 pages

	or enhancing the role of nuclear energy in the current and future U.S. energy mix		
National Conference of State Legislatures	Nuclear Power and the Clean Energy Transition • Motivations for state consideration of nuclear power • State legislative actions to support nuclear • Federal legislation (IIJA, IRA) and DOE programs	April 2023	20 pages
National Academies of Sciences, Engineering, and Medicine	Laying the Foundation for New and Advanced Nuclear Reactors in the United States • Identifying opportunities and barriers to advanced nuclear reactor commercialization in the U.S. over the next 30 years as part of a decarbonization strategy • Recommendations for DOE, NRC, other federal agencies, industry, and other stakeholders to accelerate commercialization	April 2023	278 pages
Electric Power Research Institute & Nuclear Energy Institute	Advanced Reactor Road Map • Outlines the critical strategies and support actions necessary for the successful large-scale deployment of advanced reactors.	May 2023	66 pages
National Academies of Sciences, Engineering, and Medicine	Merits and Viability of Different Nuclear Fuel Cycles and Technology Options and the Waste Aspects of Advanced Nuclear Reactors • Explores merits and viability of different nuclear fuel cycles, including fuel cycles that may use reprocessing, for both existing and advanced reactor technologies • Discusses waste management (including transportation, storage, and disposal options) for advanced reactors, and in particular, the potential impact of advanced reactors and their fuel cycles on waste generation and disposal	2023	315 pages

Advanced Nuclear Technology Primers			
Nuclear Innovation Alliance	Advanced Nuclear Reactor Technology: A Primer ● Summary discussion of advanced reactor types ● Water-cooled reactors ● Non-water-cooled reactors: ○ Salt- and sodium-cooled ○ High temperature gas reactors ○ Gas-cooled fast reactors ○ Microreactors ● DOE Advanced Reactor Demonstration Program ● Focus on technologies in development in the U.S. and Canada	Periodically updated, last revised November 2024	50 pages
Resources for the Future	Advanced Nuclear Reactors 101 ● Brief report on advanced reactors, including definitions of basic terminology	March 2021	10 pages
Nuclear Innovation Alliance	Advanced Reactor Deployment Timelines ● Brief one-pager on currently announced advanced reactor projects and corresponding timelines for deployment ● NIA also hosts an Advanced Reactor Deployment Map	December 2023	1 page
Nuclear Energy Agency	The NEA Small Modular Reactor Dashboard ● The SMR Dashboard assesses SMR technology progress across six criteria: (licensing readiness, siting, financing, supply chain, engagement and fuel)	April 2023, updated March 2024	78 pages
Transitioning Coal Plants to Host Advanced Reactors			
U.S. Department of Energy	Coal-to-Nuclear Transitions: An Information Guide ● Guide for communities considering replacing retired / retiring coal plants with nuclear plants ● Based on a technical study by Idaho National Lab, available in *Stakeholder Guidebook for Coal-to-Nuclear Conversions*	April 2024	28 pages

Prepared for the U.S. Department of Energy by Argonne National Lab, Idaho National Lab, and Oak Ridge National Lab	Investigating Benefits and Challenges of Converting Retiring Coal Plants into Nuclear Plants ● Study of the impacts and potential outcomes of a coal to nuclear transition ● Evaluates characteristics of several recently retired plants	Sept. 2022	111 pages
NASEO	Coal to Nuclear Repowering: Considerations for State Energy Offices and Public Utility Commissions ● Highlights benefits and challenges associated with coal to nuclear repowering ● Focuses on policy, programmatic, and regulatory considerations for state decision-makers	April 2024	22 pages
Prepared for the Maryland Energy Administration by X-energy and Frostburg State University	Feasibility Assessment and Economic Evaluation: Repurposing a Coal Power Plant Site to Deploy an Advanced Small Modular Reactor Power Plant ● Report on the feasibility and economic impact of siting a four-unit Xe-100 SMR at an existing coal generation facility in Maryland ● Includes a Strategic Communications Plan to ensure smooth community engagement process near the plant	November 2022	42 pages
Bipartisan Policy Center	Can Advanced Nuclear Repower Coal Country? ● Estimate of savings provided by repurposing infrastructure ● Discussion of workforce and economic impacts	March 2023	30 pages

*Models Forecasting Advanced Nuclear Capacity through 2035 - 2050*For reports longer than 50 pages, links to report synopsis webpages with summary facts and figures are included instead of links to the direct reports. All reports generally include a low, high, and (for some) medium cases for nuclear deployment, although assumptions and methodologies for cases differ across reports.			
Prepared for the U.S. Department of Energy by National Renewable Energy Lab	100% Clean Electricity by 2035 ● Estimates between 3 - 393 GW of advanced nuclear capacity by 2035	2022	161 pages
Princeton University	Net-Zero America: Potential Pathways, Infrastructure, and Impacts ● Estimates between 245 - 285 GW of advanced nuclear capacity by 2035	Oct. 2021	348 pages
Breakthrough Institute	Advancing Nuclear Energy ● Estimates between 185 - 469 GW of advanced nuclear capacity by 2050	July 2022	155 pages
Vibrant Clean Energy	Role of Electricity Produced by Advanced Nuclear Technologies ● Estimates between 60 - 336 GW of advanced nuclear capacity by 2050	June 2022	40 pages
Prepared for the U.S. Department of Energy by Pacific Northwest National Lab	Scenarios of Nuclear Energy Use in the United States in the 21st Century ● Estimates between 90 - 450 GW of advanced nuclear capacity by 2050	Aug. 2022	48 pages