



Nuclear Value Guide – NVG-012

Technology Selection and Plant Siting Guides Enhance Informed Consideration of New Nuclear

SUMMARY

Two utilities used EPRI’s siting guide to inform their technical evaluation of sites for new nuclear plants. One of the utilities used the guide to evaluate site suitability for nuclear repowering, and used a companion technology selection guide to determine which nuclear technologies were viable candidates. The second utility used EPRI siting guidance to ensure that its proposed nuclear expansion aligned with environmental, technical, and socio-economic criteria.

Background

Many utilities are considering the installation of new nuclear capacity to support demand growth, to address decarbonization commitments, and to maintain access to a reliable and dispatchable energy resource. Successful deployment of new nuclear depends on many factors, including the selection of a technology that meets the intended end-use requirements and the selection of a site that can support safe, reliable, and environmentally responsible nuclear plant operation. Applying a systematic, transparent, and data-driven decision-making process can help identify the most suitable and compliant technologies and sites for consideration.

EPRI’s Role

Several EPRI guidance documents were used by the utilities in their assessment of nuclear for future deployment.

The first utility used EPRI products 3002023910 (*Site Selection and Evaluation Criteria for New Nuclear Energy Generation Facilities*, 2022 Revision), 3002025344 (*Owner-Operator Reactor Technology Assessment Guide*, 2022 Version), and 3002026517 (*From Coal to Nuclear: A Practical Guide for Developing Nuclear Energy Facilities in Coal Plant Communities*) to assess a coal power plant site and the suitability of various nuclear technologies for deployment at that site. The guides provided a methodical approach for evaluating the site and for identifying which technologies would meet the utility’s needs and business objectives.

Applicability

All entities considering the deployment of new nuclear

Value

Application of technology selection and siting guidance can help ensure systematic consideration of all relevant factors

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EPRI's Role (continued from page 1)

The effort complemented a broader coal repurposing study that was examining an array of low to no-carbon emitting resource, but that did not include nuclear.

The second utility used EPRI product 3002023910 (*Site Selection and Evaluation Criteria for New Nuclear Energy Generation Facilities, 2022 Revision*) to help evaluate the feasibility of expanding its nuclear capacity by up to 4800 MW. The utility used the EPRI Siting Guide to identify potential constraints and opportunities at the intended site. Key criteria such as thermal capacity, existing transmission capacity, and land footprint were evaluated to develop a conceptual layout for the expansion. The member used examples and guidance in the EPRI report to establish site-specific criteria. This helped in scoring site suitability and optionality and ensured a data-driven approach to maximize site output potential while adhering to stringent constraints. The siting guide also informed proper use of a Geographical Information System and web-based tool that facilitated the evaluation of site suitability based on environmental, technical, and socio-economic considerations through the integration of various data layers such as land ownership, environmental resources, and infrastructure.

Value

The EPRI guides informed the first utility's consideration of its future generation mix in the context of a migration to low-carbon resources, ensuring that all viable technologies were adequately represented and evaluated. The results of this effort also directly informed the development of an EPRI guide on the transition from coal to nuclear, which lays out a methodical process for siting, technology selection, and the utilization of infrastructure at an existing coal facility.

For the second utility, the siting analysis ensures that the potential nuclear expansion would align with economic, environmental, and technical criteria, and that the most optimal expansion locations are identified to enable engagement before further narrowing of the site is complete. The project benefits society by providing the optionality to enable additional clean energy infrastructure to be deployed, contributing to a sustainable energy future, reducing reliance on fossil fuels, and supporting economic growth.

IMPLEMENTATION GUIDANCE

The siting and technology selection guides provide valuable screening tools as users consider new nuclear deployment. The degree of rigor applied can be modified by the user depending on the level of available information and the desired outcome of the analysis. For example, users can adjust the weighting levels for various screening criteria to align with business objectives. The guides can also be supplemented by EPRI's *New Plant Technical Assistance*, which provides targeted support at key points of new plant development projects.

Resources

- [3002023910](#), *Site Selection and Evaluation Criteria for New Nuclear Energy Generation Facilities, 2022 Revision*
- [3002025344](#), *Owner-Operator Reactor Technology Assessment Guide, 2022 Version*
- [3002026517](#), *From Coal to Nuclear: A Practical Guide for Developing Nuclear Energy Facilities in Coal Plant Communities*
- [3002026494](#), *New Nuclear Plant Project Development and Execution Guideline*
- New Plant Technical Assistance; Contact the Advanced Nuclear Technology Program for details

Access Additional Value Guides and Examples of EPRI R&D Application:

<https://interactive.epri.com/nuclear-value/p/1>

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