Engaging Wyoming Communities in an Environmental Justice Approach for Advanced Nuclear Energy Facility Siting

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ABSTRACT:

TerraPower's and PacifiCorp's plans to site and develop a Natrium advanced nuclear reactor demonstration project near the retiring Naughton coal-fired plant in Kemmerer, Wyoming—an unprecedented sociotechnical effort—provides a unique, timely, empirical context for research on the environmental justice and equity dimensions of siting advanced nuclear energy facilities. This research will illuminate how affected local communities and stakeholders understand the distribution of costs and benefits, procedural dimensions, and restorative justice potentials of this project siting. It will assess opportunities for—and potentially integrate—environmental justice approaches into this siting and design process. Beyond context-specific findings and immediate recommendations for this process, the broader objective of this research is to inform an adaptable, justice-based, community-engagement process for emerging advanced nuclear energy technology siting and development. The proposed research will build on an existing conceptual social and cultural suitability framework to assess community appropriateness for advanced nuclear energy technologies developed through the Idaho National Laboratory Emerging Market Analysis Initiative. The framework synthesizes historical energy and industrial analysis, legal and regulatory analysis, ethnographic research, and public participation processes supported by a community-based participatory research (CBPR) approach with community-based organizations and leaders to promote ethical and equitable practices. Through grounded, ethnographic research on how developers and other elite industry and government stakeholders understand environmental justice, this project will also explore whether and at what critical junctures in the siting process community-based justice priorities may meaningfully inform development decisions.

Through an embedded, single case study, this project aims to provide: [A] clear recommendations to developers, the National Reactor Innovation Center (NRIC), and the Department of Energy's Office of Nuclear Energy (DOE-NE) for the advanced nuclear demonstration project siting and development process in Wyoming; [B] a refined social and cultural suitability and community appropriateness framework based on empirical data for application to future potential advanced nuclear energy technology host communities and other energy siting; [C] legal and regulatory recommendations for environmental justice and participation procedural reforms across advanced nuclear energy siting and permitting processes; [D] scholarly products, such as peer-reviewed and edited law review manuscripts emerging across all tasks; [E] community outreach research, practice, and/or policy brief products relative to the above deliverables and appropriate for CBPR. These deliverables will present a concrete process for incorporating environmental justice into future advanced nuclear energy facility siting processes, especially impending NRIC-supported advanced reactor demonstration projects.

Ultimately, the above strategies will result in empirically based and community-driven siting recommendations to developers and elite stakeholders for advanced nuclear development in present and future siting processes. A deep understanding of the sociocultural nuances and unique needs of rural and remote Americans in the context of the first U.S. advanced nuclear reactor siting effort is, therefore, indispensable to advancing the state—and expanding the scope—of nuclear science research.