Energy Facility and Infrastructure Siting Experience and Capabilities

Energy facility and infrastructure siting entails more than just placing a structure or technology in a location—it requires interdisciplinary scientific analysis; technological and institutional innovation; and skillful integration of public stakeholders, science, and policy. Pacific Northwest National Laboratory (PNNL) advances energy facility and infrastructure siting by harnessing the talents of experts across multiple disciplines, from social and environmental sciences to natural sciences and engineering, and beyond.

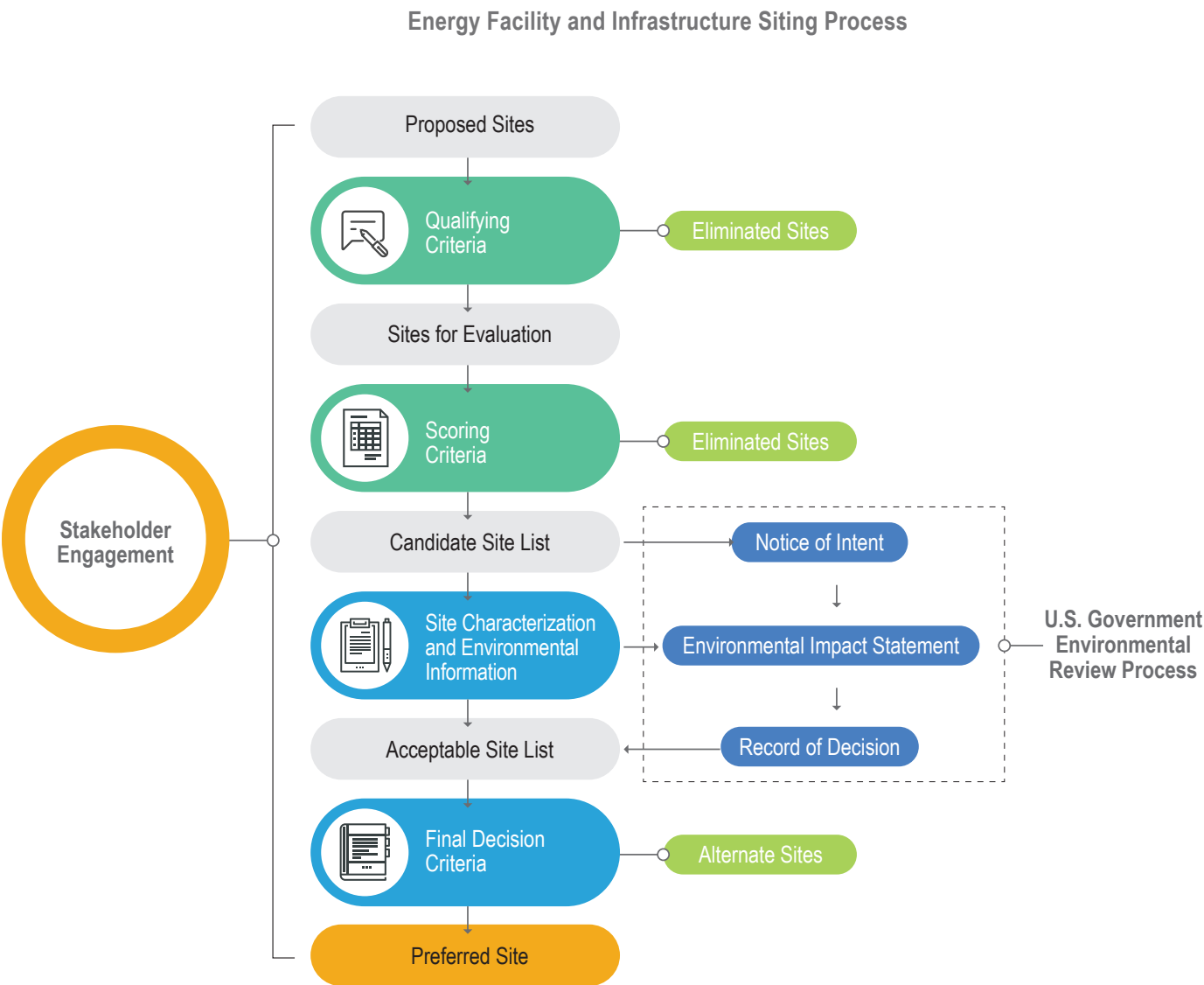# Site Identification, Characterization, and Selection

The Laboratory's support, early in the decision-making process, is proven to save time and resources during the site selection and characterization process. PNNL has a diversified team with environmental, geotechnical, engineering, and public relations experience when developing siting methodologies and involving stakeholders. Qualifying, scoring, and best value-criteria are established to identify and avoid potential challenges.

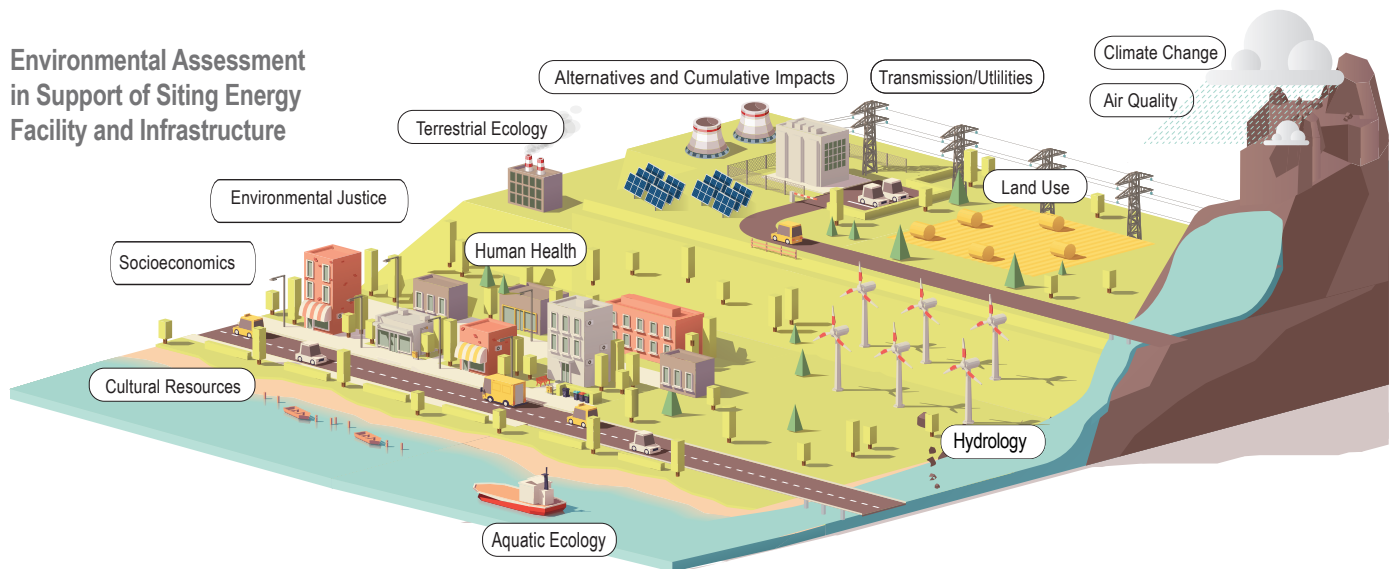PNNL also established systems to provide a standardized and equitable valuation of benefits and costs to stakeholders, including both quantitative and passive, or nonuse, valuation frameworks. The Laboratory's experts work interactively with clients and stakeholders using tools and techniques that rigorously analyze the tradeoffs between costs, public risks, and stakeholder values.

Risk Assessment

By advancing the understanding of complex Earth systems, PNNL experts quantify and mitigate the human and ecological risks posed by built systems, regulatory policies, and/or decisions made in critical areas of energy and the environment. Researchers cultivate and apply analytic methods to assess, quantify, and understand risk (e.g., safety and security) as needed to support decision-making and policy development.

Energy Facility and Infrastructure Siting Process

Environmental Assessment in Support of Siting Energy Facility and Infrastructure

Labels in illustration: Alternatives and Cumulative Impacts, Transmission/Utilities, Climate Change, Air Quality, Terrestrial Ecology, Environmental Justice, Land Use, Human Health, Socioeconomics, Cultural Resources, Hydrology, Aquatic Ecology

Environmental Assessment

Using specific measures identified during the site selection and facility design processes, PNNL supports sponsors in avoiding or significantly reducing many potential adverse effects during siting. PNNL has a team of more than 50 staff to support all aspects of environmental reviews. Competencies include integrating relevant science and engineering disciplines to evaluate environmental impacts and design effective mitigation strategies.

These credentials include deep experience in complying with National Environmental Policy Act and state equivalents, and leveraging expertise in key resource areas, including the following:

- land use
- terrestrial and aquatic ecology
- earth sciences
- meteorology and air quality
- predictive climate change modeling
- hydrology and geology
- socioeconomics
- environmental justice
- waste management
- cultural and historic resources
- visual resources
- transportation
- noise
- human health and safety, and accidents

Impacts on the environment can also affect public acceptance and stakeholder perceptions, which PNNL can characterize and address with its social science capabilities.

Environmental Baseline and Predictive Modeling

PNNL develops and performs confirmatory assessments of models to describe and understand resource baseline conditions, trends, and interactions spanning time and geographies, and models that can rapidly predict the effects of anticipated natural changes and socioeconomic activities on resources. Experts also offer their proficiency in predictive modeling to forecast impacts on environmental baselines associated with climate change.

Threatened and/or Endangered Species

Experts provide analysis and assistance to federal sponsors when conducting biological evaluations and assessments to support compliance with Section 7 of the Endangered Species Act. PNNL biologists are also experienced in the preparation of essential fish habitat assessments to support federal sponsor consultation with the National Marine Fisheries Service in compliance with the Magnuson-Stevens Act.

Stakeholder Engagement

PNNL is an experienced leader in developing, organizing, and facilitating in-person and hybrid public and tribal meetings that meet the needs and requirements of the client and effectively engage affected and underrepresented stakeholders.

StakeholderEngagement

Consent-Based Siting

PNNL helps federal agencies approach the siting of facilities in ways that prioritize the participation and needs of people and communities. Experts develop and facilitate outreach strategies, communication tools, stakeholder events, and more opportunities that help sponsors seek a community's input into the process.

Native Nations, Tribal Engagement and Consultation

With experience in supporting federal sponsors in developing and maintaining trusted relationships with Native Nations and American Indian tribes, PNNL has a strong track record in conducting tribal-specific, culturally sensitive engagement and collaboration. This includes identifying tribes that have geographic connections to various projects throughout the U.S. and expertise in National Historic Preservation Act, Section 106 consultations, experience with traditional cultural property documentation, and conducting oral history interviews.

Environmental Justice

As it relates to the nation's energy system, PNNL is helping to achieve environmental justice by partnering with federal and state agencies, and industry, to identify and include disadvantaged and underserved groups in regulatory decision-making, and in the evaluation of the consequences of large and complex policies and projects.

PNNL experts apply their proficiencies in social and decision science to conduct assessments that examine environmental, cultural, and socioeconomic impacts of proposed actions, as well as tradeoff assessments.

Science and Society

As applicable during site selection, risk and environmental assessment, and stakeholder engagement, PNNL experts also offer various capabilities and tools to collect, track, and analyze public input. Doing so enhances understanding of the relationship between energy systems and individuals and communities to support decision-making and produce an administrative record. The tools and capabilities include the following:

- a public comment database
- community-scale surveys
- social media and web content (conceptual and relational) analyses
- multistakeholder interviews
- focus groups
- community modeling
- educational and communications materials testing

ENVIRONMENTAL JUSTICE ANALYSIS PROCESS