Renewable energy resources project

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DOE is supporting 12 state-based collaboratives working across 13 states as part of the Renewable Energy Siting through Technical Engagement and Planning (R-STEP(TM)) funding and technical assistance program. Learn more>>

The siting of large-scale land-based renewable energy projects on private property brings together a combination of stakeholders from local, state, federal, and Tribal governments, renewable energy developers, landowners, and other community members to consider how factors such as the following will affect the outcomes of a given project:

Renewable energy projects can create benefits for host communities and the environment, as well as developers. To realize these potential benefits, the siting process must include meaningful community engagement, thoughtful planning, careful technical analysis, and integration of stakeholders" priorities. The U.S. Department of Energy (DOE) conducts research, provides science-based resources, and offers technical assistance to inform stakeholders and improve confidence in the siting process.

Large-scale renewable energy projects, especially wind and solar power, will play a pivotal role in decarbonizing the grid quickly and cost-effectively to achieve President Biden"s goals of a 100% clean electricity by 2035 and net-zero emissions economy by 2050.

The entities with authority to review permits and other applications for large-scale renewable energy projects, and the processes they follow, are complex, dynamic, and vary widely by state, facility size, and technology type.

On June 13, 2024, DOE and others released a report cataloging siting policies and permitting authorities on a state-by-state basis. The report highlights how these policies and authorities vary by state, facility size, and technology type. It also identifies the level of government that has the authority to set standards (laws and ordinances) such as setbacks, tip heights, decibel levels, viewshed impacts or acreage limits for large-scale renewables siting and construction. Additionally, the report highlights public involvement requirements, and more for each state.

Click the states on the map to explore state-specific siting policies and permitting authorities. For a detailed explanation of how contingencies differ between wind and solar,please seeFigure 3 and Table 2 in the full report.

A key finding from this state-by-state policy analysis is that, while 97% of states maintain some state-level control of the permitting process, 37 states (73%) empower local authorities to determine the siting standards. To highlight the role and impact of zoning ordinances in renewable energy siting, the National Renewable

Energy Laboratory (NREL) recently published a database of local ordinances for wind energy and solar energy projects. NREL used this database to analyze the implications of restrictive zoning practices on land availability for wind and solar deployment.

Host community members are those who live in the area where a potential renewable energy project will be built. Community members typically have an opportunity to ask questions and voice opinions about proposed facilities through public comment periods or public meetings, hearings, and informational meetings, although the process varies significantly by jurisdiction and by project.

Renewable energy developers often lease or buy land from private landowners. Landowners considering whether to lease or sell their land to developers must negotiate terms and conditions (e.g., amount of compensation) with the developer. Resources for landowners considering leasing or selling land to developers can be found on websites, such as Michigan State University, Pennsylvania State University and Ohio State University for solar and DOE"s Wind Energy Economic Development Guide.

Trusted, third party entities such as universities, Cooperative Extension, community-based organizations, facilitators, legal counsel, and others may also play a key role in siting and permitting decisions for renewable energy projects by providing communities and decision makers with a neutral source of information and educational resources. These entities can also provide advisory services to help communities understand their options when proactively planning for future deployment and opportunities for achieving community benefits when a project is being proposed.

While every community has its own unique priorities and needs, permitting requirements, renewable energy potential, and other siting considerations, siting of renewable energy projects generally includes the steps described below. Community engagement is important throughout this process.