

Study of Energy Zones in the Eastern Interconnection

Project Summary

Introduction

The Eastern Interconnection States' Planning Council (EISPC) has identified a total of eight types of energy resources (with subtypes) that could be considered for clean energy resource development within the U.S. portion of the Eastern Interconnection (EI) (Figure 1). These resources include biomass, clean coal technologies with carbon capture and sequestration, geothermal, nuclear, solar (photovoltaic [PV] and concentrated solar thermal, as well as rooftop PV solar), storage (pumped-hydro storage and compressed air energy storage), water (hydroelectric power), and wind (both on-shore and off-shore siting). For each of these major technology categories, the resource data and information will be compiled, reviewed, and assembled into a geographic information system (GIS) database. The information in the database will be used by a Web-based tool that will allow stakeholders to identify areas that could be suitable for developing clean energy resources or to determine potential Clean Energy Zones (EZs).

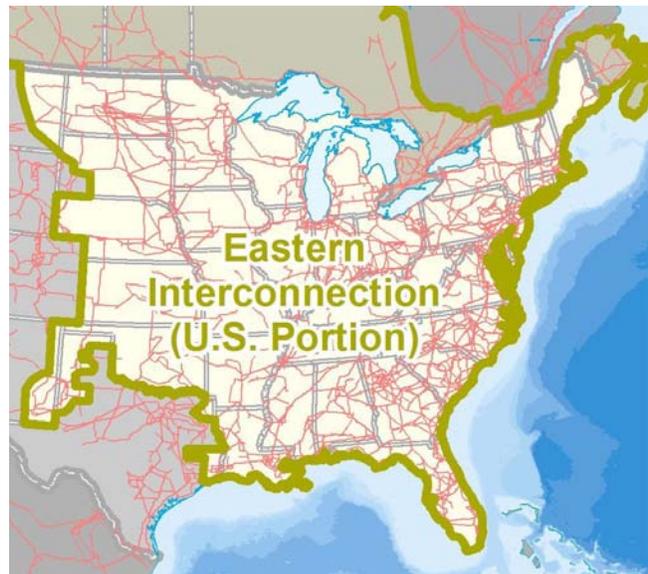


Figure 1: U.S. Portion of the Eastern Interconnection

Methodological Approach

One of the goals of the EISPC Clean Energy Zones study is to develop a methodology and process for identifying potential clean energy resource areas that may lend themselves to designation by States as Clean Energy Zones within the Eastern Interconnection. Therefore, one objective is to identify areas within the EI that are suitable for clean energy resource development, rather than to perform either the actual designation of Clean Energy Zones (this task will be left to the jurisdictional authorities in each State) or the actual siting of new clean energy projects. Another study objective is to develop a Web-based tool that will enable EISPC stakeholders to perform the analysis and identify potential clean energy resource areas within the EI or their State or region of interest. To perform this analysis, the Web-based tool will allow EISPC stakeholders to use energy resource availability, screening parameters,

and other criteria to develop customized maps depicting the suitability of different areas within the EI for clean energy resource development. The stakeholders will be able to perform the analysis for a single clean energy resource or for two or more energy resources by taking possible synergies between the resources into account. The synergy analysis will highlight areas suitable for more than one technology of interest and consider both positive synergies where energy projects would complement each other and negative synergies where energy projects would compete with each other. Possible impacts of nonzonal resources and technologies, such as demand response, energy efficiency, and smart grid technologies, will also be identified because in some cases, these resources/technologies may affect the development of clean energy resources.

GIS-Based, Multi-Criteria Decision Support System (Mapping Tool)

The Web-based mapping tool to be developed as part of this EZ study will be a GIS-based, multi-criteria decision support system (MCDSS) with a set of menu options to guide the analysis. The analytical process will involve a number of steps, which may also be customized by the user depending on the type of clean energy resource being analyzed, the area of interest, and other user-specified parameters. This functionality will allow for an analysis that can be tailored to the specific needs of each user and will result in customized maps of areas suitable for clean energy resource development. The MCDSS methodology and the Web-based mapping tool are not intended to provide the means for a detailed siting analysis of any specific clean energy project. Rather, the intention is to enable stakeholders to identify, in a map format, clean energy resource areas that could have the potential to be developed as energy zones.

Users can gain access to the tool after completing a registration and approval process; subsequently, after completing a login process, users can run the tool and save or recover work between sessions. The underlying intention is for this tool to be public and open to all EISPC stakeholders and other legitimate users. Although the tool will be public, however, the users will not be able to access or download the information stored in the GIS database directly. Rather, depending on the specific options and choices of parameters specified by the user, the tool will retrieve the necessary information from the GIS database, process it according to the user-selected parameters, and display it in a map format. In addition, there will be options so users can save the analysis results in a GIS-compatible format (e.g., shape files [.shp]) or printable map form (e.g., PDF).

Study Team

This EISPC study is a collaboration among three national laboratories: study team members from Argonne National Laboratory, the National Renewable Energy Laboratory, and Oak Ridge National Laboratory provide the analytical and model development support to the EISPC. The funding support for EISPC's Clean Energy Zone study and the national laboratories' work therein is provided by the U.S. Department of Energy.