RE DATA EXPLORER: SUPPORTING RENEWABLE ENERGY ZONES TO ENABLE LOW EMISSION DEVELOPMENT

Figure 1. The RE Data Explorer is available for the Lower Mekong region of Asia as well as other geographic locations.

The RE Data Explorer, developed by the National Renewable Energy Laboratory, is an innovative web-based analysis tool that utilizes geospatial and spatiotemporal renewable energy data to visualize, execute, and support analysis of renewable energy potential under various user-defined scenarios. This analysis can inform high-level prospecting, integrated planning, and policymaking to enable low emission development.

In 2016, the RE Data Explorer was significantly expanded and scaled up to support renewable energy planning in several partner countries of the U.S. Agency for International Development's Enhancing Capacity for Low Emission Development Strategies (EC-LEDS) program. The RE Data Explorer is currently available and being applied to support LEDS and related efforts in the Lower Mekong region of Asia (Figure 1) and the Philippines. The RE Data Explorer is currently under development for Afghanistan, Bangladesh, Indonesia, Kazakhstan, Kenya, Mexico, and Nepal. The RE Data Explorer builds on a desktop-based version of the tool (available for the countries listed above along with several others) to provide further functionality and a user-friendly online interface.

WHAT IS GEOSPATIAL DATA SCIENCE?

Geospatial data science characterizes the surface of Earth—from topography and the atmosphere to groundwater and geology, on scales from local to global.

With geospatial data science, we can examine, for instance, the spatial relationship of wind speed—or wind resource—to other pertinent information, such as locations of environmentally sensitive areas and transmission lines.

By recognizing these spatial relationships, we can gain a fundamental understanding of renewable energy potential: how much energy we can get out of the technology. That understanding can guide decision making, attract investment, and ultimately reduce greenhouse gas emissions.

Geospatial data science can support a number of key policy areas to enable low emission development, as highlighted in Figure 2.

THE **EC-LEDS** PROGRAM

Low emission development strategies (LEDS) are national development plans that promote sustainable human and economic development while reducing greenhouse gas emissions.

Enhancing Capacity for Low Emission Development Strategies (EC-LEDS) is a U.S. government program that supports partner countries in their pursuit of LEDS. EC-LEDS enhances other LEDS efforts by (1) providing technical assistance to develop and implement LEDS and (2) building a shared LEDS knowledge base.

EC-LEDS country partners include Albania, Bangladesh, Colombia, Costa Rica, Gabon, Indonesia, Kenya, Macedonia, Mexico, Moldova, the Philippines, Serbia, and Vietnam.

RE DATA EXPLORER FOR RENEWABLE ENERGY ZONES

Renewable Energy Zones (REZ) are developed through a transmission planning and approval process customized for renewable energy. The process aims to enable full use of high-voltage transmission lines. REZ have been successfully deployed in the states of Texas, California, Colorado, and internationally. The REZ process is guided by in-depth stakeholder engagement to identify new transmission zones with access to large amounts of high quality renewable resources. REZ analysis can play an important role in supporting implementation and mobilizing finance for critical low emission development actions in the energy sector. To support REZ analysis, the RE Data Explorer can be used to identify and visualize potential transmission corridors through the evaluation of accessibility and feasibility (technical potential) and resource quality and quantity, as shown in Figure 3. These corridors can then be designated as REZ. The RE Data Explorer visualization, analysis, and data access functions can also enable project developers to evaluate each zone based on desired metrics.

RE Data Explorer analysis can feed into broader stakeholder discussions and allow stakeholders to easily visualize potential REZ and access pertinent data to inform transmission planning and enable investment. For more information on REZ, read the Greening the Grid overview.[1]

RE DATA EXPLORER SUPPORT RESOURCES

The EC-LEDS Geospatial Analysis Tools web page (https://www.ec-leds.org/tools-page/geospatial-analysis-tools) provides training materials, including a web-based tutorial for the RE Data Explorer. Up to 40 hours of expert assistance to support geospatial analysis for low emission development is also available through the LEDS GP Remote Expert Assistance on LEDS (REAL) service (ledsgp.org/assistance/).

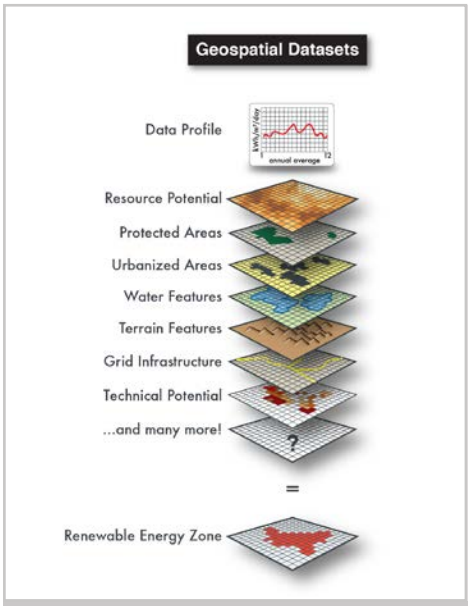

Figure 3. The RE Data Explorer helps visualize potential transmission corridors based on layers of geospatial data.

EC-LEDS is working with Mexico to develop and implement a REZ methodology. The REZ process will enable analysis to define areas with high renewable energy resource potential. The overarching goal is to design and construct transmission infrastructure in a way that cost-effectively delivers the electricity generated by clean energy resources to load centers across the country.

[1] http://www.nrel.gov/docs/fy16osti/65988.pdf

Figure 2. Geospatial data science can support a number of key policy areas to enable low emission development.

For questions about EC-LEDS

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