

RENEWABLE ENERGY RESOURCE MAPPING

Supporting Strategic Planning and Commercial Development by Investing in Global Public Goods



In many developing countries, high quality data on the technical and economic potential, geographic concentration, or seasonal availability of indigenous renewable energy resources does not exist, hampering strategic planning and commercial investment. The impact of this include poorly planned or sited projects, increased site prospecting costs, higher financing costs due to increased resource risk, and a lack of transparency in relation to land compensation.

In response, the Energy Sector Management Assistance Program ([ESMAP](#)) launched a major global initiative in 2013 to support renewable energy resource assessment, mapping, and geospatial planning, including ground-based measurement campaigns where needed. The initiative is now entering a second stage with publication of a [Global Solar Atlas](#) (and plans to do the same on wind and hydropower), which will enable all developing countries to get access to the latest data.

PROGRESS AND INITIAL RESULTS

The ESMAP initiative on [Renewable Energy Resource Assessment & Mapping](#) covers biomass, small hydropower, solar, and wind. Up to the end of 2016, US\$27 million of ESMAP funding has been allocated to a series of global, regional and country projects. ESMAP has

used the experience gained from these projects, and from our team of experts and international vendors, to develop standardized materials to support World Bank Group lending operations, and also projects being undertaken independently by other countries or development partners. For example, our Terms of Reference and other materials have been incorporated by projects in Armenia, Bangladesh, Botswana, Lebanon, Mauritius, Mexico, Morocco, Pacific Islands, West Bank & Gaza, among others.

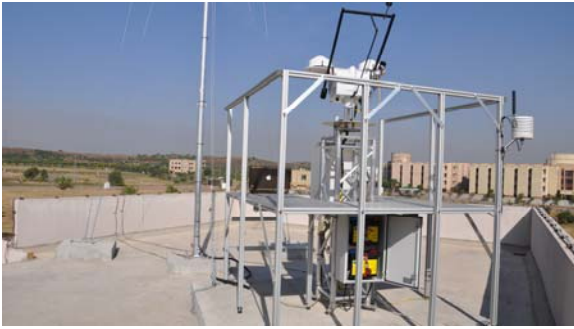
Results from ESMAP-funded project so far include:

Ethiopia | The wind mapping project is being expanded to identify wind farm sites for commercial development

Nepal | The initial wind mapping outputs will provide inputs to a prefeasibility study for a wind farm

Pakistan | The solar and wind maps show huge potential in the west of the country, opening up a new frontier for future development

Tanzania | 70+ promising small hydropower sites were identified, some of which will be offered to private developers under the Tanzania Energy Development and Access Project (TEDAP)



The Energy Sector Management Assistance Program (ESMAP) is a global knowledge and technical assistance program administered by The World Bank. It provides analytical and advisory services to low- and middle-income countries to increase their know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth. ESMAP is funded by Australia, Austria, Denmark, the European Commission, Finland, France, Germany, Iceland, Japan, Lithuania, the Netherlands, Norway, Sweden, Switzerland, and the United Kingdom, as well as The World Bank.

PARTNERSHIPS

ESMAP has partnered with the International Renewable Energy Agency (IRENA) to enable World Bank mapping outputs to be accessible through the [Global Atlas for Renewable Energy](#), with the measurement data published on The World Bank’s new [energy data platform](#). ESMAP is also working closely with the US National Renewable Energy Agency and other expert organizations to ensure close collaboration and to share experience.

At the project level, partnerships have been entered into with a number of our development partners, including the European Commission and GIZ, and with local agencies such as institutes of energy, meteorological departments, and universities.

FUTURE PLANS

Over the next four years, ESMAP will build on the success of this initiative by dramatically increasing the number of countries that benefit from public data on renewable energy resource potential while providing more targeted support to investment projects being developed by client countries with World Bank Group financing. Building on the success of the [Global Solar Atlas](#), ESMAP intends to work with Denmark Technical University to improve and relaunch the [Global Wind Atlas](#), and will explore a similar deliverable on hydropower. In-depth country studies and measurement campaigns will continue, but will be more targeted at near-term investment opportunities.

RENEWABLE ENERGY RESOURCE MAPPING PROJECTS

PROJECT	BIOMASS	SMALL HYDRO	SOLAR	WIND
Bangladesh			✓	✓
Ethiopia				✓
Indonesia		✓		
Madagascar		✓		
Malawi			✓	
Maldives			✓	✓
Nepal			✓	✓
Pacific Islands (SIDS-DOCK)				
Pakistan	✓		✓	✓
Papua New Guinea				✓
Regional: East Africa			✓	
Tanzania		✓	✓	✓
Vietnam	✓	✓	✓	✓
Zambia			✓	✓