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## South Asia Group for Energy–Bhutan

Bhutan's electricity system is already low-carbon through the use of hydropower. However, generation from hydroelectric plants is reduced during the dry winter months and will be impacted by climate change and other extreme weather events. Bhutan is mitigating these risks by diversifying their energy mix with clean energy resources.

Bhutan is exploring photovoltaic (PV) solar energy development to enhance its energy system's overall resilience. To ensure efficient grid planning and solar integration, Bhutan's power generator, Druk Green Power Corporation, and the transmission and distribution utility, Bhutan Power Corporation, are partnering with the **South Asia Group for Energy (SAGE)** to develop their solar capabilities, integrate solar energy into the grid, and strengthen Bhutan's energy infrastructure and efficiency.

### Project Activities

#### 1. Site-Specific Solar Resource Assessment

SAGE aims to empower Bhutan's power grid stakeholders with the skills needed to assess site-specific solar resources. This includes understanding solar radiation and measuring it accurately and modeling PV potential.

The National Renewable Energy Laboratory (NREL), one of the SAGE members, is developing Bhutan's capability in solar resource assessment through training on site-specific solar radiation measurements, available tools and resources for solar assessment, and hands-on, in-person workshops.

#### 2. Capability Building in Solar Engineering Design

SAGE is also working to enhance Bhutan's capacity in solar engineering design and project delivery processes. This involves comprehending PV device principles, site selection, integration into the electric grid, and the financial aspects of PV projects.



Engineers and the NREL team visiting solar sites near Paro, Bhutan in June 2023. Photos courtesy of Andy Walker, NREL.

NREL helped equip stakeholders with skills in PV system design and operation through visits to potential PV sites and a comprehensive solar system design engineering workshop in June 2023. The team conducted an example site assessment near Paro, Bhutan, and prepared site assessment and feasibility study reports as part of the training.

### 3. Knowledge Cohorts on Essential Topics

SAGE is facilitating knowledge-sharing sessions between Bhutan's grid stakeholders, international experts, and the Royal University of Bhutan. These sessions cover critical topics such as solar grid-interconnection codes, energy efficiency, and seasonal storage to accelerate Bhutan's clean energy progress.

## About SAGE

SAGE is a consortium consisting of the U.S. Agency for International Development and three U.S. Department of Energy national laboratories: Lawrence Berkeley National Laboratory, NREL, and Pacific Northwest National Laboratory.

Through SAGE, governments, public institutions, and private sector partners in South Asia can access best-in-class energy expertise from U.S. national labs to support long-term planning and strategic development and receive consultation on complex energy challenges.

SAGE is supporting Bhutan's transition to a more sustainable and renewable energy future, aligning with the nation's ambitious goals for a greener energy grid. Learn more and explore SAGE resources by visiting [www.sarepenergy.net/sage](http://www.sarepenergy.net/sage).



Solar and wind site near Paro, Bhutan. *Photo courtesy of Andy Walker.*

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## South Asia Group for Energy



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