CLEAN ENERGY
SOLUTIONS CENTER
ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY

SUPPORTING CLEAN ENERGY DEVELOPMENT IN SWAZILAND

CLEAN ENERGY
MINISTERIAL
Accelerating the Transition to Clean Energy Technologies

Swaziland, a country largely dependent on regional fossil fuel imports to meet power needs, is vulnerable to supply changes and price shocks. To address this challenge, the country's National Energy Policy and Implementation Strategy prioritizes actions to enhance energy independence through scaling up renewable energy and energy efficiency. With approximately 70% of the country lacking electricity, Swaziland is also strongly committed to expanding energy access to support key economic and social development goals. Within this context, energy security and energy access are two foundational objectives for clean energy development in Swaziland.

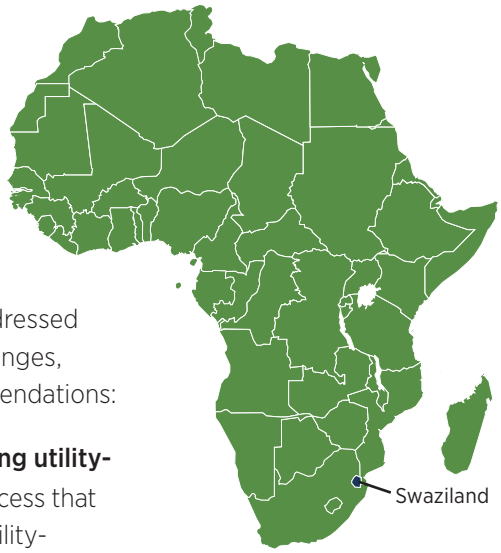
Manzini, Swaziland is the proposed location for the 100-MW solar project.
Photo from Tonny Nooyens

In 2014, the Swaziland Energy Regulatory Authority (SERA) partnered with the Clean Energy Solutions Center via its Ask an Expert service to review a license application for a 100-megawatt (MW) solar photovoltaic (PV) independent power plant to be located on a farm site south of Manzini and interconnected with the national grid. The license application represented the first of its kind for Swaziland, and it provided a new experience for SERA in reviewing the application. Given the size of the proposed project, assessment of impacts on electricity system reliability and costs would play a critical role in application review.

SWAZILAND COUNTRY PROFILE	
Total area	17,364 km^2
Population density	68.2/km^2
Energy supply	66% biomass, 23% petroleum products, 8% coal, 3% hydro
Electrification rate	27%
Installed generation capacity	150 MW (90 MW of thermal power and 60 MW of hydropower)
Electricity imports	80% of electricity imported from South Africa and 10% imported from Mozambique

Source: http://www.sera.org.sz/index.php?option=com_content&view=article&id=7&Itemid=30

Recommended Solutions



The Solutions Center partnered with SERA to support critical analysis of the solar project application. Through review of key regulatory considerations, the analysis identified significant risks in relation to the size of the proposed project and overall system reliability, as well as potential implications for Swaziland ratepayers that would need to be adequately addressed in the context of project development and licensing. To address these challenges, experts from the Solutions Center's service proposed the following recommendations:

- **Develop a streamlined, rigorous and transparent approach for licensing utility-scale independent electricity generation.** A strong framework and process that identifies key steps and actors to efficiently support each stage of the utility-scale renewable energy licensing process can support renewable energy project development in Swaziland. In particular, clearly articulating project and analytical requirements (e.g., interconnection impact studies) and potential opportunities for application improvements and revisions can support project developers in submitting robust applications. In addition, the process can incorporate a multi-tiered approach to allow for a less detailed and faster review of project applications that will not significantly impact the electricity system overall. Finally and importantly, the Swaziland Electricity Company utility can provide critical inputs to the project development and application process by supporting robust system impact analyses for proposed interconnected projects and providing system reliability certifications to be included in application packages. Given the size of Swaziland's current electricity system, accommodating the addition of 100 MW could have serious implications for overall power reliability and service quality. Thus, reliability analysis and certification are key components in supporting further integration of power generation sources.

- **Develop clear plans and guidance regarding payment for system upgrades and utility-scale interconnection.** Developing a consistent approach and rules to cover costs associated with potential transmission extension and system impacts can enable further clean energy development in Swaziland. For instance, it is important to consider how system upgrades, major line extension and incremental system integration costs will be allocated across project developers, utilities and governments. To support consistency across projects, a high-level cost allocation approach can be established and then further defined, based on project specifics, before generation licenses are provided.

- **Establish a high-level renewable energy framework, including a transparent and competitive tendering approach for utility-scale clean energy projects.** At the highest level, development and implementation of a legal and planning framework as well as key objectives for utility-scale renewable energy development can provide a strong foundation for ongoing project development. Within this framework, robust, open and transparent utility-scale tendering processes could support least-cost clean energy generation that is aligned with broader objectives.

Impact of Assistance

To catalyze clean energy development in Swaziland, the partnership between SERA and the Clean Energy Solutions Center supported the formulation of building blocks and a sound framework for renewable energy project licensing. Based on recommendations provided through the partnership, SERA implemented several key actions to improve the robustness of the renewable energy licensing process.

SERA took the following specific actions to improve the 100 MW PV project application review process:

- Requested system impact and compensation studies
- Requested revised financial statements and cash projections for plant development and operation
- Reviewed the Swaziland Electric Company power purchase agreement with an emphasis on pricing.

More broadly, SERA also established renewable energy project application conditions and requirements for licensing, including:

- Engaging key government institutions and authorities to assess environmental and water impacts associated with project development and provide approvals
- Establishing penalty responsibility in the event of default
- Establishing connection and wheeling agreements
- Achieving compliance with the recently adopted grid code
- Conducting network simulations.

The partnership between SERA and the Clean Energy Solutions Center led to concrete outcomes to support clean energy development in Swaziland. Improving renewable energy project licensing processes will enable Swaziland to achieve key national objectives to expand clean energy access and transition to greater energy independence.

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> The report will continue to guide the regulator…[and] also be used as a reference and guide for future applications and developments that will take place in the sector [including] the ongoing development of an Integrated Resource Plan, which requires the Authority to establish a framework for soliciting renewable power as recommended in the review report.
>
> —Mzwandile R. Msibi, Compliance Monitoring Officer, Swaziland Energy Regulatory Authority

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