

Seychelles island microgrids

Today, the majority of Small Island Developing States (SIDS) rely on imported diesel fuel to generate electricity on the islands. This reliance on diesel exposes SIDS to multiple challenges. First, the fuel must typically be transported great distances at great expense and the resulting electricity tariffs can be staggeringly high. In 2010, for instance, when global oil prices were higher than they are today, some Pacific SIDS reported tariffs above \$1.00 per kilowatt-hour --roughly 10 times the average price in the United States.

SIDS's reliance on diesel presents serious energy security consequences as well: when oil prices spike, SIDS's utilities can find themselves unable to afford the fuel needed to keep their generators running and severe weather events can make it impossible to deliver fuel. Finally, as part of their efforts to demonstrate leadership in international climate negotiations, many SIDS have set ambitious renewable energy targets that are at odds with their continued use of diesel.

Solar powered microgrids appear to offer a significant opportunity for SIDS to lower their electricity costs and improve their energy security, while also advancing their climate objectives. The cost of solar photovoltaic (PV) installations has fallen dramatically in recent years. The costs of battery storage systems, which make it possible to integrate high penetrations of PV without jeopardizing reliability, have dropped significantly too. In light of this progress, and the extremely high cost of fossil generation on SIDS, the case for transitioning to solar power should be clear.

Despite the great potential microgrids hold, the workshop also revealed a number of challenges that need to be overcome before SIDS can reap the full benefits these systems offer. The "Top Ten" such challenges, and potential strategies for overcoming them, are presented in Part II below. It is our hope that this document will help guide other SIDS that may be considering adopting solar powered microgrid solutions in their territories.

The Grid Code for the Seychelles set out the technical requirements for the connection of renewables to the power system, in order to guarantee stable and safe behaviour given the high shares of renewables planned by 2030. The Grid Code covered steady state and dynamic performance requirements, communication and control protocols, simulation models and certification.

Description: The Seychelles aim to cover 5% of electricity with renewables by 2020 and 15% by 2030. The local power system operator commissioned a Grid Absorption Study to determine the technical limits for reaching these targets. The study focussed on how much photovoltaic (PV) generation the grid can absorb. As result, the primary bottleneck was found to be the maintenance of backup generation reserves to compensate for fast down-ramping of PV generation.

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