Dominica commercial microgrids

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It"s October, and that means it"s still hurricane season in the Caribbean. The people of the region and their governments can be forgiven for viewing each tropical depression with dread. The hurricanes that battered Caribbean islands in 2017 have imposed devastating economic and personal hardships, with effects that will linger for years.

Monster hurricanes have prompted intense scientific study of the complex relationships between fossil fuel burning, climate change and the strength of tropical storms. Meanwhile, fossil fuels also create financial challenges for island economies.

Most Caribbean islands are heavily dependent upon diesel oil for electricity generation, leaving island governments and utilities vulnerable to unpredictable fluctuations in world oil prices and delivery interruptions caused by severe weather. Aside from the energy security issues, the import of expensive liquid fuels to generate electricity imposes burdensome cost-of-living expenses on economically disadvantaged residents and stifles economic opportunity. For example, the Caribbean regional average for residential electric utility rates is a whopping US$0.33 per kilowatt hour (kWh), nearly three times more expensive than the US average of US$0.12/kWh.

In the Eastern Caribbean, countries are implementing pilot projects and examining new policies to promote renewable energy and improve their local economies as well as their resilience to severe weather events. Specifically, the island nations of St. Lucia, St. Vincent and the Grenadines and Grenada – are exploring the most promising business models for scaling up commercial and industrial solar (C& I) photovoltaics (PV) and studying ways to eliminate barriers to clean energy development.

The countries of the Eastern Caribbean benefit from sharing experiences and observing rapidly advancing solar development in other countries. But, Emily Chessin of the Cadmus Group says, "Small Caribbean island nations face their own particular challenges which need to be addressed in a way that is tailored to their national context."

Given the high cost of fossil fuel-generated electricity and the abundant renewable energy resources, why haven"t Eastern Caribbean countries made more progress in their transition to renewable energy? Despite government commitments and utility actions their mixture of ownership models, the utilities of the Eastern Caribbean are all facing similar types of challenges, not the least of which is extreme weather that can threaten investments in renewable energy infrastructure, and lack of space for PV arrays on small islands.

One of the most important challenges, according to Chessin, is the small scale of the utilities on these Caribbean islands, sometimes limited to serving tens of thousands of customers. This means that customer-sited solar PV projects have an immediate impact upon revenues. "This is creating some opposition

to rapid development of customer-sited solar development among these utilities for several reasons," she says, and points out that commercial and industrial customers are a vital source of revenue for utilities. They include hotels, resorts, airports and large stores, farms, breweries and a bit of industry on the larger islands.

Local solar developer Denell Florius, CEO and Co-Founder of EcoCarib in St. Lucia says for utilities, "This is a massive opportunity for them, a chance to update their systems and move into the future." He adds, "The C& I customers are really the drivers of this because we are a following culture. Most people will observe what the bigger players are doing and follow them."

As a response, utilities are implementing or considering an approach that requires customers to sell all of their generation and purchase all their electricity from the utility, thereby reducing some of the revenue erosion concerns. St. Lucia, for example, is considering this "buy-all, sell-all" policy and it would effectively bar self-consumption. In order to avoid these constraints, some customers are considering grid defection. That is still relatively minimal but it"s starting to occur among tourist destinations that want to project a "green" image. It could pose financial and technical operational issues to the utility if enough customers – encouraged by declining storage prices – leave the utility provider.

There are some policies to encourage solar PV investment on these islands including waivers on import duties and value added tax, net metering, and net billing schemes. But, utilities and island governments haven"t yet determined a mix of policies, regulations, and incentives that would balance the priorities to encourage customer-sited solar PV development while ensuring financial survival of the utilities, and preventing cost shifts to customers that do not have solar PV systems.

Other important barriers to new solar PV development in the Eastern Caribbean include:

HOMER Energy is participating in a World Bank-funded study of the most promising business models for scaling up commercial and industrial solar (C & I) photovoltaics (PV) in the Eastern Caribbean. The study parallels development of three World Bank-sponsored solar PV projects: a hospital in St. Lucia, a school in St. Vincent, and a Community College in Grenada. These solar PV projects will increase the amount of renewable energy in each country"s electricity mix while helping them reach their energy security, resilience, and sustainability goals.