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Alternative Strategies are Needed to Lower Renewable Energy Prices

Energy prices in the Caribbean are more than twice the world average, for a majority of countries. This information may be found in Marla Dukharan's [*Caribbean Energy Price, Second Edition*](#). The most expensive electricity in St Kitts-Nevis, Bermuda, Saba and Bonaire, is over three times the world average. The only places in the Caribbean where electricity costs are relatively low by world standards are Suriname and Trinidad and Tobago.

Most Caribbean countries have ambitious targets for switching to renewable energy sources in hopes of reducing energy costs. However, as of 2024 only three countries had achieved renewable energy production in excess of 30% of usage - Belize with 77%, Suriname with 61% and French Guiana with 44%. Suriname has the lowest energy price in the Caribbean (along with Trinidad and Tobago) - about 80% below the regional average - and prices in Belize and French Guiana are also substantially lower than elsewhere in the Caribbean. The thing that distinguishes

these three countries is the fact that their main source of renewable energy is hydroelectric power.

In contrast, in countries where the renewable energy strategies depend on solar and wind, the proportion of renewables in total energy consumption is no higher than 11% and energy prices remain high.

The important distinction between a strategy based on hydropower on the one hand, and one based on solar and wind on the other, is that the latter sources are variable. Hydro power systems operate just like fossil fuel plants: full power is available on demand, to be turned on and off as needed. The power is supplied from central generating stations, just like fossil fuel plants, and is distributed through the existing grid.

A renewable energy strategy based on solar and wind power is more complicated because it requires a form of storage. The power is produced during sunlit hours and when winds reach operational speeds, and it must be stored to be delivered as and when needed. As with hydro power, there are no fuel costs, but the costs of installing, maintaining and operating storage facilities adds to the total cost of delivering variable power to businesses and households.

One form of storage facility is an artificial hydro system with two lakes, separated vertically so as to allow power to be generated by releasing water from the header to the lower lake. Variable power is used to pump the water back up to the header lake. This system is therefore referred to as pump storage. In Germany variable power is used to pump water into existing hydro systems in Norway, to the benefit of both countries. In the Caribbean, where similar ready-made pump storage options are not available, installing pump storage is a very expensive option.

Battery storage is cheaper and more common. However, batteries have a finite life and battery technology is still evolving, so battery storage is more costly than first appears, once the risks and costs of obsolescence and replacement are taken into account.

The cost of renewables may rise even further if the country chooses to go the route of distributed power, licensing individual consumers and businesses to supply power to the grid. The less costly alternative is to opt for solar and wind farms operated by an already established power supply company. The company can store the power centrally for distribution through the existing system with no further cost.

However, Caribbean countries have mostly opted instead for distributed power supply, which comes with very high additional investment requirements. The existing distribution systems, which step down power from central generating stations via substations to consumers, have to be replaced in order to allow large amounts of distributed power to be fed into the grid. A new system must be installed, with sensors throughout the grid reporting to a central highly sophisticated controller, which modulates the balance of power produced and consumed at every node in the network at all times.

The high costs of a renewable energy system using mainly variable sources, together with a distributed power supply, have now become apparent in many countries which have adopted this strategy. With energy prices already very high, raising electricity rates to cover the finance costs of investment in storage and smart grids may not be the best option for the Caribbean. An increase in tariff rates would lower standards of living and increase costs to domestic producers, making countries less competitive internationally.

Evaluation and adaptation in the light of experience are key to the success of the renewable energy strategy. The Caribbean experience to date suggests that the preferred option for the renewables strategy is hydroelectric power, either as the main element in the strategy or as the storage facility for systems that use solar and wind power.

It is also evident that the objective of lowering energy costs to the consumer will not be achieved with a system of distributed power supply. The way to afford consumers the benefit of low-cost wind and solar power is to provide incentives for power companies to invest in solar and wind farms with storage, and to distribute electricity through the existing grids in which investment has already been sunk over many decades.

My Economic Letters may be found under "[Commentary](#)" at DeLisleWorrell.com. I welcome your comments.