



Green Stimulus and Recovery Series

GREEN STIMULUS IN THE CARIBBEAN

Resilient Distributed Energy Resources Can Support Job Creation
and Economic Diversification

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Green Stimulus and Recovery Series

Rocky Mountain Institute’s Green Stimulus and Recovery Series presents our insights on how countries around the globe can use stimulus and recovery investment to build back better from the COVID-19 crisis and advance us toward a cleaner, healthier, more just, and more resilient future for the one planet we all share. The reports provide a framework for planning and evaluating stimulus efforts along with recommendations for green stimulus and recovery investments and actions specific to the United States, China, India, sub-Saharan Africa, and the Caribbean that can help optimize efforts to rebuild in these countries and regions.

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Executive Summary

Distributed energy resources (DERs) bring multiple benefits not only to electricity systems but also to communities and economies. Many islands in the Caribbean are transitioning from electricity systems that are traditionally centralized in nature and powered by fossil fuels, to a new paradigm incorporating DERs. While this transition was underway prior to the current global COVID-19 pandemic, stimulus efforts to recover from its effects should aim to accelerate progress in implementing DER solutions and provide other significant benefits. The main need in the near term to support a successful recovery is jobs; advancing DER projects such as solar photovoltaics (PV), wind, electric vehicles, and energy efficiency creates immediate and diverse jobs, including project managers, electricians, civil engineers, electrical and mechanical engineers, plumbers, machinists, heavy equipment operators, technicians, metal workers, general construction workers, designers, and salespeople.

Of the nine islands representing the Eastern Caribbean States (ECS), five fall within the top ten countries worldwide that rely on the travel and tourism industry for more than 15% of their total share of employment. All nine states fall within the top twenty. Furthermore, on average, the ECS rely on travel and tourism for more than 60% of their total share of employment. These states comprise a total area of approximately 3,000 km², 650 thousand people, and 500 megawatts of installed capacity for electricity generation. This presents a tremendous opportunity for stimulative job growth in these countries and the wider Caribbean market. The analysis presented here focuses on representative islands in the Caribbean and shows an opportunity to create immediate job opportunities to offset approximately half of the job loss seen during the current pandemic by focusing stimulus efforts on DERs, including:

- 750 jobs over five years by pursuing 50 megawatts of solar PV;
- 300 jobs over five years by pursuing 30 megawatts of wind;
- 300 jobs over three to four years by converting 10,000 vehicles to electric;
- 300 jobs by installing electric vehicle charging infrastructure for every 10,000 vehicles; and
- 100 jobs and 80% energy savings by investing \$10 million in energy efficiency updates in existing buildings.



In addition to putting people back to work now, incorporating DERs supports long-term priorities, including improving system resilience and supporting economic development through a diversified economy. The experience of the Caribbean region in deploying DERs as a form of resilience to hurricanes and as a cornerstone of the recovery from the current pandemic can inform opportunities in other geographies.

Rocky Mountain Institute recently released a global stimulus principles paper that provides a framework for planning and evaluating future stimulus efforts. The report emphasizes four priorities: create jobs and grow the economy; support public health and reduce air pollution; enhance economic, energy, and climate resilience; and decarbonize. These principles are applicable in the Caribbean region, and the opportunities available to deploy them in the Caribbean can inform and support stimulus efforts in other regions as well. In line with the global stimulus principles that RMI has proposed, this report highlights opportunities for following actions in the near term to drive recovery and growth through a focus on DERs in island nations:

- Backstop electric utility credit;
- Create clean energy lines of credit; and
- Enact policy measures to incentivize DERs.

Caribbean islands have positioned themselves as leaders in the global energy transition. From electricity systems that have historically been heavily reliant on imported fossil fuels burned at a central plant, island leaders have spearheaded a transition to distributed indigenous resources for electricity generation that are connected to the grid at various locations. For example, Saint Lucia's first large solar photovoltaic (PV) project generates an amount of electricity equivalent to the needs of approximately 6% of homes on the island, and displaces 1.5% of the diesel fuel previously required each year to generate Saint Lucia's electricity. Islands are poised to continue and accelerate this transition; while each island may have unique priorities, this trend toward utilizing local, renewable resources results in benefits such as lower electricity costs, increased resilience to external shocks, and enhanced economic development and diversification.

COVID-19 has highlighted the importance of resilience—not only to climate-related crises such as hurricanes, flooding, and droughts, but also to other types of crises such as the ongoing economic and public health system shock. The clean energy transition already happening in many islands should not stop because of the pandemic, and in fact shaping stimulus and recovery efforts to center on accelerating the energy transition will result in many layers of benefits in both the near and long term.



Resilient DERs Can Support Job Creation and Economic Diversification



1 The Power of Distributed Energy Resources

A focus on distributed energy resources (DERs) in stimulus and recovery efforts will ensure a continuation of the Caribbean's current energy transition trajectory and provides other direct benefits. DERs can include sources of electricity generation as well as energy storage technologies, electric vehicles and charging infrastructure, and energy efficiency or other demand-side efforts. Utilizing these resources in a distributed manner (rather than the traditional centralized electricity system architecture):

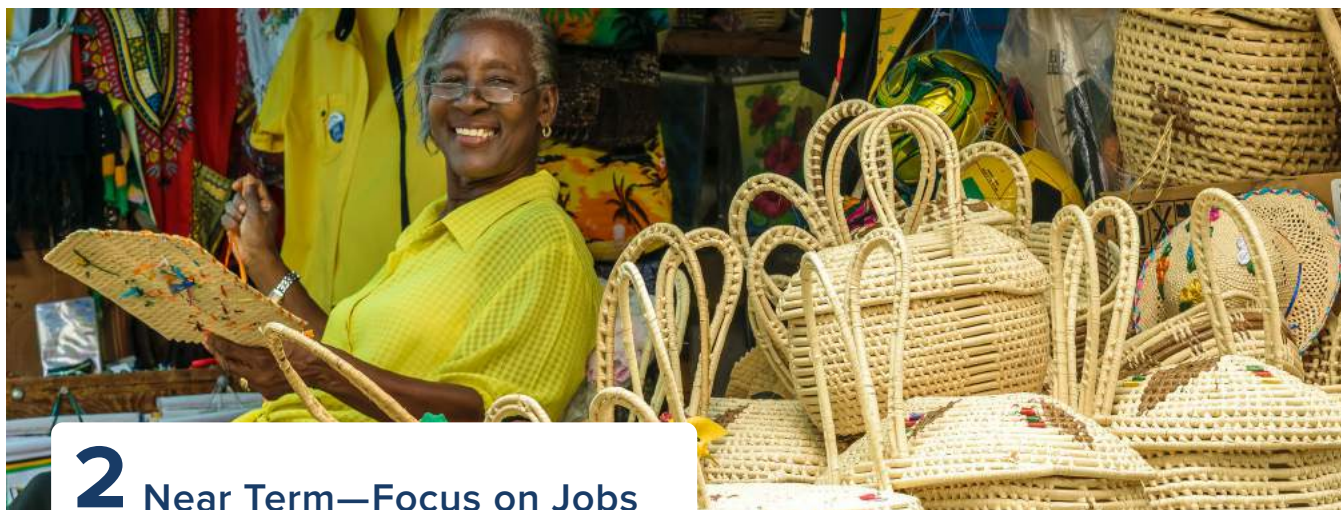
- Enhances resilience (different resource types in different locations are less likely to all be impacted at one time by an external shock);
- Optimizes space (resources are incorporated into the built environment and don't need to compete with other important land uses);
- Raises inclusivity (communities and individuals have more opportunities to participate in and shape their energy systems); and
- Enhances flexibility (different technologies can be incorporated and operated in innovative ways to meet electricity needs in changing circumstances).

An initial focus on critical facilities kickstarts a broader transition to an energy system that incorporates more DERs. Hospitals, water treatment facilities, community centers, and schools provide critical services, and even more so during extreme circumstances (e.g., following a hurricane or during a pandemic). DERs sited at these key pieces of infrastructure can connect with and provide generation and support to the grid during times of normal operations, often at a lower cost than generating additional electricity at a central plant. When an extended outage on the grid system occurs, they can then separate (if designed and installed as microgrids) to continue serving the most critical equipment or electricity needs at that site.

Incorporating DERs into island energy systems will create jobs now, increase resilience to climate and economic factors, and support the development of a diversified economy. Stimulus and recovery efforts should focus on this opportunity to achieve a myriad of benefits in the near and longer term through increased deployment of DERs.



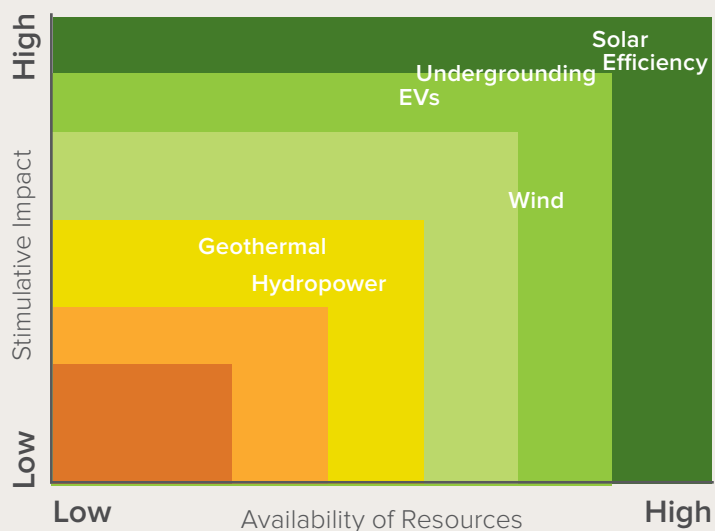
Resilient DERs Can Support Job Creation and Economic Diversification



2 Near Term—Focus on Jobs

The focus on the green energy transition in the Caribbean has created much excitement over the past 10 years. However, often the enthusiasm has been dulled by the limited number of proven pathways tailored to the island context. The dialogue has focused on the environmental impact of the clean energy transition—overlooking the positive impact of job creation. Globally, much of the analysis and studies focus on green job creation via industrial manufacturing. However, given the Caribbean region's limited capacity to manufacture industrial products at a large scale and the physically distributed network of island states, there are few individual islands suited for industrial green jobs. More mature and competitive manufacturing regions in Asia, Europe, and North America will simply out-compete Caribbean manufacturing.

Prioritizing Options



For this analysis we focus on those DER sectors or technologies that can best stimulate job creation in the Caribbean. Although jobs can be created in other sectors, we use this opportunity to focus on those sectors that are most impactful, that have fewer barriers to entry, and where resources are readily available (low-hanging fruit). Accordingly, we excluded sectors and technology such as biomass, ocean thermal, geothermal, hydrogen fuel cells, rooftop solar thermal, and solar thermal electric power. While we know that these sectors can have long-term strategic advantage, they do not provide the immediate stimulus impact needed.



To determine the most suitable technologies, we assessed each technology based upon the availability of the resource and its correlated impact on the economy. The technologies and measures that provided the highest economic stimulus impact include several types of DERs: solar PV, wind, energy efficiency, and electric vehicle (EV) assembly and retrofits. It is important to note that the opportunities described in this section provide greater benefit to island communities, including improving the electricity and transportation sectors, while also putting people to work now; these are efforts that are beneficial regardless of when and how they are implemented, and they are also ideally suited to stimulating economies as we recover from the current pandemic.

The job opportunities discussed below are also in expanding sectors; although many Caribbean islands are unlikely to have significant manufacturing or industrial sectors, skills such as installation, operations, and project management will be in high demand in coming years across the region and globally. In addition, the analysis presented here focuses on direct job impacts, those that are required to implement specific DER projects. Indirect job impacts (such as providing goods and services to support the direct work) and induced job impacts (such as providing food, housing, healthcare, etc.) are not included in the analysis, but would have significant broader impacts across the entire local and regional economy.

Solar Photovoltaic Jobs

Solar PV deployment provides the widest range of green energy jobs to the Caribbean economy. These jobs include project managers; electricians; surveyors; civil engineers; electrical engineers; geotechnical and mechanical engineers; plumbers; machinists; heavy equipment operators; technicians; metal workers; heating, ventilation, and air conditioning (HVAC) experts; general construction workers; designers; and salespeople. Many of these jobs are high paying and require specialized skills. Much of the region's labor force is qualified in related trades that have these specific or transferable skills, many of whom can be immediately put to work.

In the medium term, youth training programs can be established to train and certify many people currently unemployed due to the COVID-19 pandemic who are willing to enter the new labor market. Simultaneously, apprenticeship programs could provide trainees with hands-on experience. For example, the Youth Employment Services at the Ministry of Education and Culture in Anguilla and the British Virgin Islands that provide training or apprenticeship opportunities to troubled youth can be scaled up to provide services to these sectors. Programs that are carefully crafted can lead to long-term employment and skills development for large segments of the population.

To put the green job opportunity that solar PV provides in the Caribbean into context, RMI estimates that an island with a population of 100,000, a labor force of 50,000, and 40,000 electricity consumers facing a 10% increase in the unemployment rate (a loss of 5,000 jobs) due to COVID-19, could put approximately 750 people to work for a period of five years by pursuing a 70% solar PV penetration target.



Wind Energy Jobs

Given the wind resource availability in most islands, wind has the potential to create green jobs, reduce energy costs, and stimulate economic development. Wind farm construction and generation has the potential to generate jobs throughout the Caribbean, although at a smaller scale and slower pace than solar PV. Like solar PV, wind farm jobs range from project managers, electricians, and engineers to general construction workers. However, unlike solar PV, wind jobs are largely in engineering and construction. This is primarily due to the massive foundations required; onshore wind is considered here, while offshore opportunities may exist for many islands as well. Although not as immediately stimulative due to the lead time needed to study, site, and construct wind turbines, wind has the potential to generate a significant number of jobs over a five-year period. A wind turbine foundation typically requires close to 500 m³ or roughly 60 truckloads of concrete and a significant amount of heavy equipment for one turbine, requiring the employment of operators for excavators, trucks, a number of cranes, and more.

Similar to the process conducted in the evaluation of solar PV, RMI's analysis determined that an island with roughly 30 megawatts of peak generation and a 70% renewable energy penetration target could generate an additional 300 highly paid jobs over a five-year period by pursuing wind.

Vehicle Electrification Jobs

Transportation electrification is relatively new to most Caribbean islands, which are in a unique position to take advantage of the electric vehicle transition business case. Due to the small geographic size of most islands and limited commuter distances, EVs can be effectively utilized for a wide range of island activities. In other words, range anxiety is a non-issue. In Bermuda, EV rentals are well utilized. Due to concerns over traffic congestion, Bermuda is focused on implementing smaller one- and two-seater EVs to support tourism. These vehicles not only serve as a means of transportation but are quickly becoming a popular tourist attraction/excursion.

Anguilla is a perfect example to illustrate the potential for EVs. The island is relatively flat, has a small geographic footprint (58 square kilometers [km²]), and residents' average daily commute is 10 km or less. With these favorable EV characteristics, Anguilla can integrate EVs with an 80 km to 200 km range. Given the low commuter distances, the island could easily introduce lower-cost EVs that allow flexibility in vehicle configurations.

Several islands like Barbados and Bermuda have made some headway in establishing electric vehicle markets. On the other hand, islands with lower per capita income, such as St. Vincent, have made little or no progress in transitioning to EVs. The average first cost for a new entry level EV ranges from \$30,000 to \$40,000, import duties range from 0% to 100% across islands, and shipping costs could range from \$2,000 to \$5,000 per vehicle. Meanwhile, the average monthly income in St. Vincent is approximately \$1,300 versus \$6,200 in Bermuda. This puts EVs out of reach for the average citizen of lower-income islands. As such, it is critical that alternative approaches be adopted for the region. Strategies to consider include converting mass transit, developing and incentivizing a used EV market, and retrofitting or converting internal combustion vehicles. Understanding each island's current environmental, social, economic, and topographic characteristics is key to developing a successful EV integration strategy. To better assess the impact of EVs, RMI assessed the benefits of each approach.



Used Electric Vehicle Imports

The used EV market is a fast-growing market throughout the world. Several countries have turned to the used EV market because of the great potential and flexibility it offers. To incentivize the transition, countries such as New Zealand and Canada offer significant rebates and have worked to build out charging infrastructure to support the market. In New Zealand, the number of electric vehicles on the road nearly tripled in two years from 2017 to 2019 with a goal to reach 64,000 electric vehicles by the end of 2021.

The Government of New Zealand announced a proposed incentive scheme to transition to cleaner, low-emissions EVs. A large part of this strategy is to incentivize used vehicle imports. The government developed a feebate scheme and a US\$3.7 million contestable fund to encourage innovation and investment and help accelerate uptake of electric and other low-emissions vehicles in New Zealand. The feebate lowers the cost of imported electric vehicles while adding fees onto the cost of high-emissions vehicles. Thus, EVs such as the Nissan Leaf—with a first cost as low as \$7,000 through programs such as New Zealand’s—become attainable for the average Caribbean citizen whose typical monthly income is \$1,300.

One of the main concerns generally expressed with used EVs is the aging batteries not giving sufficient range. An EV with 100 km of range is a disincentive in the United States, where the daily commute can range from 30 to 100 km. Given the small size and shorter commutes of Caribbean islands, this concern is not as applicable. Most EV manufacturers warranty their batteries for eight years and 100,000 miles. Over the past 10 years, not only has the cost for the average lithium-ion battery pack declined by over 80%, but its expected life span has improved by more than 50%.

Electric Vehicle Conversion

Given that the average first cost for a new entry-level EV ranges from \$30,000 to \$40,000 and the typical monthly income in the Caribbean region is roughly \$1,300, it is critical to explore converting internal combustion vehicles to electric.

In recent years, there has been a surge in used Japanese vehicle imports throughout the Caribbean. Many of these used vehicles have an average useful life of five years. Parts have been almost impossible to source for many of these vehicles and when they are readily available, the cost to purchase and repair is typically comparable to the purchase price of the original vehicle. This resulted in many abandoned vehicles contributing to environmental degradation. Meanwhile, the costs to convert gasoline vehicles start as low as \$7,000 to \$10,000 based upon required capacity. Using these vehicles for EV conversion lowers the cost substantially below that of new EV imports.

Most of these vehicles are compact passenger vehicles with small engines and small bodies. This provides an ideal opportunity to implement EV conversion programs that will have a multitude of benefits including creating high-paying mechanical and other jobs, recycling of vehicles, lowering the cost of entry for EVs, and reducing the rate of vehicle imports and export of GDP.

Assuming there are 10,000 vehicles readily available for EV conversion on a given island, a properly established three to four-year conversion program would create approximately 300 jobs. These jobs range from automotive mechanics to laborers.



EV Infrastructure Investment

A transition to utilize a significant number of EVs will require investment in infrastructure to charge these vehicles. In addition to an estimated 3.5% annual contribution to GDP, an EV infrastructure investment program would add a significant number of jobs immediately. The impact of these additional jobs would not only stimulate economic recovery but also establish any island as an advanced smart economy.

The installation of charging stations will require people with various technical and general construction skills. These jobs include electricians, electrical apprentices, masons, and laborers. Although there will be additional indirect jobs created, we did not include those in this analysis.

To illustrate the benefits of an EV infrastructure program, we evaluated the conversion of roughly 10,000 vehicles; we estimate that it would require roughly 8,000 home and public charging stations to serve these EVs being used for personal, transit, and other fleet purposes. Accomplishing this buildout over a three-year period would require approximately 320 workers including electricians, masons, and laborers.

Fuel Savings

Beyond the potential for job creation described above, two key advantages to an EV are the positive impact it has on the environment and the immediate financial savings it offers. With a four-hour charging duration, a battery capacity of 17 kWh, and a 180 km driving range, operational cost would be approximately \$7.00/month. This is comparable to \$31.00 for a similar-sized gasoline vehicle. Thus, every 10,000 internal combustion vehicles replaced with EVs equates to an annual savings of \$3 million. These savings increase by 60% if the EVs are charged via renewable energy resources rather than a fossil-fueled electricity system, bringing the total annual savings to \$5 million, not including avoiding negative externalities like health costs due to air pollution from traditional vehicles.

Energy Efficiency Jobs

COVID-19 caused the loss of many maintenance, construction, and other technical jobs in the tourism industry. These workers can be immediately redeployed to retrofit schools, hospitals, and other government buildings. Upgrading outdated equipment and renovating to new, greener facilities will provide a massive economic stimulus while reducing waste and improving the environment.

Studies show that nearly all efficiency measures, especially in the buildings sector, have positive employment and economic effects. A 2000 study by the UK Government (British Association) concluded that every \$1.4 million invested in residential energy efficiency creates 11.3 to 13.5 jobs. Converting older buildings will provide jobs for engineers, electricians, air conditioning/heating technicians, plumbers, and architects. A \$10 million investment could create over 100 new jobs. Furthermore, greener buildings using new technological solutions have the potential to save up to 80 percent of energy consumption.



Resilient DERs Can Support Job Creation and Economic Diversification



3 Long Term—Focus on Increased Resilience and Economic Diversification

The near-term job creation opportunities in DERs discussed above result in additional benefits of increased resilience and economic diversification—both key objectives for Caribbean islands.

Resilience

The term resilience is most commonly used in the context of extreme shocks to a system—for example a weather event like a hurricane in the Caribbean, a typhoon in the Philippines, or a wildfire in California causing an extended outage on the electricity system. These types of weather-related shocks are becoming more frequent and severe due to the effects of the global climate crisis. Specifically, in the Caribbean context, the most significant damage following a weather-related shock typically occurs in the transmission and distribution system that delivers electricity across the island to residents, rather than the actual electricity generation systems. As opposed to the centralized generation resources typically used today, distributed electricity generation resources can be connected to the main grid while being able to segment and provide electricity to a smaller area when there's an issue on the larger system.

Critical Infrastructure

DERs allow electricity service to be returned in specific areas more quickly and can be centered at critical infrastructure such as hospitals, community centers, schools, and water treatment facilities to ensure that the most essential needs of communities can be met. In the near term, the job creation discussed above can focus on implementing DERs at the most critical facilities to contribute to the longer-term goal of building resilience.

As we're seeing through the global COVID-19 pandemic, another aspect of resilience is in regard to economic or other shocks—things that have a significant impact on electricity demand or a swing in the cost of fuel or operation for the electricity system. Clean energy resources can improve resilience in this regard, in large part because clean energy options utilize local resources such as the sun, wind, water, or underground pressure and temperature. Once the initial investment is made to install a clean energy project, the ongoing resource needs are completely local rather than imported. Reducing an island's reliance on imported fuels reduces the risk of serious impact from large fluctuations in price for those fuels, as well as changes in electricity demand.



Undergrounding

In the past three years, five Category 5 hurricanes hit the Caribbean, and storms of this size are expected to continue to batter the region. This presents a clear and astronomical risk; in 2017 alone, over 15 islands were deeply impacted by Hurricanes Irma, Jose, and Maria. These storms caused unprecedented devastation for the region. The level of damage to the electricity grids across the islands was extensive, taking several islands over six months to fully recover. The United Nations (UN) Economic Commission for Latin America and the Caribbean (ECLAC) estimated approximately \$1 billion dollars of direct infrastructure damage to five of the fifteen islands including Anguilla, The Bahamas, British Virgin Islands, St. Maarten, and the Turks and Caicos Islands; this included the extensive damage to the electrical grid. In addition to the direct costs, island residents and businesses incurred revenue losses and had to pay high costs to import temporary generation, gasoline/diesel to run backup generators, and much more. These storms wiped out over four times the GDP of some islands within hours. Given the increased risks posed by climate change and the need to put the construction sector to work post COVID-19, undergrounding presents an opportunity to vulnerable islands, which they should seriously consider.

Undergrounding electricity grids creates an extensive number of new jobs. These jobs include project managers, electricians, civil and electrical engineers, machinists, heavy equipment operators, technicians, and traffic controllers, along with general construction workers to build trenches and manholes. On average, every 100 miles of electricity grid infrastructure undergrounded would create 200 full time jobs for trenching, cabling, and traffic control.

Economic Diversification

Clean, distributed energy resource options also support economic diversification, a key opportunity in islands that has been illustrated during the COVID-19 pandemic. With a core economic sector of tourism, many islands face severe impacts from the shutdown of global and regional travel. In addition to building a clean energy sector through direct job impacts as discussed above, DERs provide opportunities for additional diversity in an island's economy, for example expanding sectors that are small or nascent today such as agriculture, information technology, and advanced transportation. While building a more diverse economy is a longer-term goal for many islands, a focus on DERs now supports these efforts through both immediate job creation and building a foundation for supporting new sectors with low-cost, reliable electricity.

Energy and Agriculture

Across the Caribbean region, entrepreneurs have started a wave of grow local—eat local initiatives that created a rebirth of agroindustry in the region. Most islands continue to import over 80% of their food from Europe and North America. Transforming this industry will therefore not only create a great opportunity to build food resilience and improve the health of Caribbean residents, but also contribute to a substantive economic stimulus. The high cost of energy in the region has hampered the industry's ability to achieve scale.

Agro-industrial farms have a mixed history in the Caribbean region, with failures of large-scale agriculture production as farms in industrialized countries receive government subsidies and higher yields due to ready access to fertilizers, automation, mechanization, and access to large-scale processing via an advanced supply chain. These farms outcompete those of Caribbean farmers. The development of new sustainable small-farming concepts, technologies, and growth in local demand for organically grown and healthy fresh produce presents a new opportunity for local farmers. Throughout many communities, small-scale family farms and cooperatives work to grow produce for self-sustenance and to sell to local markets. Although this provides some jobs, large-scale production is limited due to lack of access to modern farming technologies and higher energy costs.



If local farms could have access to new techniques and technologies, as well as lower energy and water costs, they could expand their markets to the region. In recent years, there has been a prolonged drought throughout the eastern Caribbean. This has made it difficult for local farmers to produce consistent and bountiful yields. One potential solution would be to increase water production through desalination to supply farmers. Despite wide availability of desalination throughout the region, the cost of doing so is extremely high due to the cost of electricity making up over 60% of water cost. The high cost of electricity makes irrigation through desalination unviable. With the introduction of DERs, modernized farming techniques and other sustainable methods can increase yields and provide a source of employment and export revenue for any island.

Droughts will continue to be one of the major challenges facing farmers in the Caribbean. With reduced rainfall, dependence on local water production for irrigation has grown. As most islands produce water through desalination, they consume a lot of energy and incur significant costs for water. As a result, large-scale farming is not sustainable. It is critical to reduce energy costs to support local, smaller-scale farming operations.

COVID-19 increased concerns of food security throughout the region. The disruption of supply chains in the United States due to an increase in coronavirus infections at processing plants had a trickle-down effect on food exports. Most Caribbean islands depend on food imports for over 80% of their food supply with some depending on imports for up to 99%. This dependence raised concerns about food security throughout the region. Governments are now increasingly turning to the development of local farming.

This is a positive trend for the islands. It has been shown that there are significant health benefits to consuming locally grown foods. Not only are these foods fresher but they are also more nutritious. Many imported foods are treated to extend the shelf life during transit. Additionally, many of these foods are picked young when they are less nutritious. Locally grown products will not only create new farming jobs but also reduce healthcare costs given that they use less chemicals, pesticides, fertilizers, and irradiation, all of which are linked to various health concerns.

Transitioning to renewable energy will not only improve farmers' yields, increase profitability, and enable expansion to new markets, but will also create new jobs in the sector. As farms grow, more workers are hired. Reduced costs will also enable new entrants to the market. The average small farm has approximately three workers in addition to the owners. These farms could potentially grow tenfold allowing farms to add additional workers, equating to thousands of additional farm jobs on the average-sized island.



Resilient DERs Can Support Job Creation and Economic Diversification



4 Immediate Stimulus Recommendations

Along with the clear opportunity to include DERs in stimulus packages, both local and international stakeholders can take additional steps to support Caribbean islands in achieving the benefits outlined in this paper. These include:

- **Backstop electric utility credit** and ensure access to low-interest credit to incentivize public-private sector investments. Many Caribbean electric utilities are on the verge of bankruptcy due to significant reduction in electricity sales during the COVID-19 pandemic. Ensuring that electric utilities have sufficient access to credit to cover payroll and maintain acceptable credit ratings is critical to crowding in reputable independent power producers. This is because contract terms and access to low-cost financing for clean energy projects is predicated on utility credit ratings as the off-taker of any power purchase agreement.
- **Create clean energy lines of credit** designed to backstop power purchase agreements (in place of a sovereign guarantee) and capital leases to crowd-in private sector investment in DERs. For government-owned utilities, sovereign guarantees are required to backstop power purchase agreements. COVID-19 has stressed public finances even further and highly limited fiscal space (based on debt to GDP) is unavailable to be accessed in the form of sovereign guarantees. In its place, lines of credit backed by the international financing institutions can be provided to replace the need for a sovereign guarantee, which will also enable the private sector to secure a low cost of capital, further driving down the cost of clean energy investments and, in turn, the cost of electricity.

Green Stimulus in the Caribbean



- **Enact policy measures to incentivize DERs**, including deployment of both renewable energy and electric transport options. These could include:
 - Clear national targets or guidelines, for example setting a date after which traditional internal combustion engine vehicles will no longer be allowed to be imported.
 - Straightforward processes for piloting DERs with new business models, for example with utility ownership and operation of renewable energy and energy storage resources sited on customer-owned properties.
 - Reducing or waiving duty fees on clean energy components and electric transport materials, which many islands have already implemented. When established in concert with setting clear dates before which the duty amounts cannot change, the increased certainty boosts investor confidence. This leads to increased investment and a longer project pipeline.



5 Building from the Caribbean Experience

Just as Caribbean islands can continue and even accelerate their clean energy transition during and after the COVID-19 pandemic, other regions and geographies can apply insights from the islands' experiences. While climate-related shocks may look different in various locations (e.g., hurricanes in the Caribbean, wildfires in California), we're now seeing that economic-related shocks such as the current global slowdown during the pandemic impact us all. Focusing on opportunities to create jobs in the very near term, with those efforts centered on increasing resilience in all forms in the medium term, will support communities both small and large to build back better from the impacts of COVID-19. Distributed energy resources provide both short-term and long-term benefits and should be central to stimulus and recovery efforts in the Caribbean and beyond.



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