CLIMATE ANALYTICS

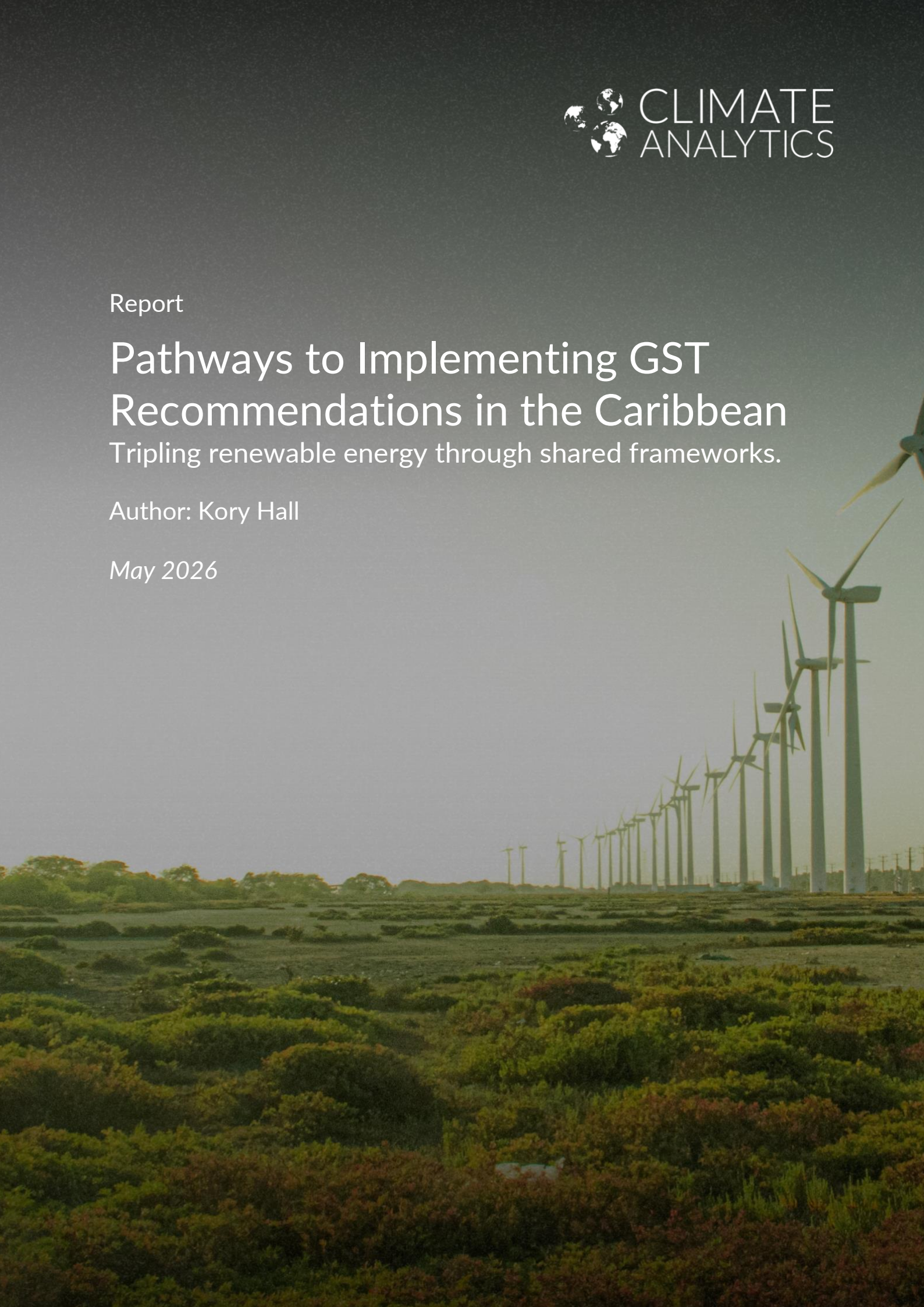
Report

Pathways to Implementing GST Recommendations in the Caribbean

Tripling renewable energy through shared frameworks.

Author: Kory Hall

May 2026



Author(s)

Kory Hall

Contributors or reviewers

Rueanna Haynes, Kristin Qui

About Climate Analytics

Climate Analytics is a global climate science and policy institute. Our mission is to deliver cutting-edge science, analysis and support to accelerate climate action and keep warming below 1.5°C.

How to cite: Climate Analytics (2026). Pathways to Implementing GST Recommendations in the Caribbean

Summary

The Caribbean's pursuit of a 1.5°C aligned energy transition stands at a critical inflection point. With renewable energy penetration averaging approximately 12% across CARICOM as of 2022, the region faces the dual challenge of accelerating deployment while safeguarding energy security and economic resilience. The Global Stocktake (GST) has called for the tripling of renewable energy capacity and the doubling of energy efficiency improvements by 2030. While ambitious, this target is neither unrealistic nor unattainable in the Caribbean context. The region's estimated collective technical potential of over 4,500 MW of solar, 2,000 MW of wind, and 3,800 MW of geothermal, comfortably exceeds the 1,300 –2,000 MW required to meet these benchmarks. The central constraint, therefore, is not resource availability, but the alignment of policy, institutions, and finance to translate potential into delivery.

This report, together with its annexed country studies, examines how the Caribbean can operationalize the GST's "energy package" within its structural constraints. It assesses current transition targets, proposes guidance, and establishes benchmarks to support the global objective of limiting warming to 1.5°C. At its core, the analysis highlights a necessary shift from fragmented, project-based implementation toward coordinated, programmatic action at both national and regional levels.

The Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS) remains the region's most established framework for guiding this transition. Since its adoption in 2009, it has provided a structured basis for policy reform, investment coordination, and progress monitoring. Its alignment with GST objectives and its integration into Nationally Determined Contributions (NDCs), offers a practical pathway to scale ambition while avoiding duplication of effort. Embedding GST targets within NDCs also strengthens investment planning and improves access to international climate finance, including support from the Green Climate Fund and other development partners.

Despite this foundation, progress across the region remains uneven. Structural constraints continue to limit the pace and scale of deployment. Fragmented regulatory frameworks, aging grid infrastructure, and limited access to affordable finance remain persistent barriers. In many jurisdictions, electricity sectors are still governed by outdated legislation that does not accommodate modern renewable technologies, while licensing processes are often slow and opaque. Simultaneously, gaps in technical and financial data undermine investor confidence and hinder the development of bankable projects.

These structural issues are compounded by external vulnerabilities. Caribbean economies remain highly exposed to global energy price volatility, climate-related shocks, and constrained fiscal space driven by debt. Governments must therefore balance the urgency of transition with the imperatives of affordability, reliability, and macroeconomic stability. Addressing these challenges will require coordinated policy reform, strengthened institutions, and innovative financing mechanisms tailored to small island developing states.

Country experiences across Saint Lucia, Saint Kitts and Nevis, Belize, and Trinidad and Tobago illustrate both the diversity of national pathways and the common conditions for success.

Saint Lucia demonstrates a structured, data-driven approach to transition planning. Through its National Energy Policy, National Energy Transition Strategy, and Integrated Resource Plan, the country has established a coherent framework for investment. Its target of achieving 50% renewable electricity generation by 2030, up from approximately 5% in 2023, is supported by scenario modelling that balances cost, reliability, and emissions reduction.

Saint Kitts and Nevis highlights how ambition and innovation can compensate for scale constraints. Its target of 100% renewable electricity by 2028 is supported by utility-scale solar and battery storage investments expected to significantly reduce diesel dependence. Complementary geothermal development, supported by the Caribbean Development Bank, demonstrates the role of blended finance in de-risking projects.

Belize reflects a pragmatic, institution-focused approach. Emphasis on data systems, procurement reform, and workforce development has strengthened its ability to scale renewable investment. Its efforts to standardize Requests for Proposals and Power Purchase Agreements, alongside participation in regional data platforms, underscore the importance of transparency and consistency in reducing transaction costs.

Trinidad and Tobago presents a more complex transition pathway. As a hydrocarbon-based economy, it must balance decarbonization with economic dependence on fossil fuels. However, its industrial base and technical capacity position it to support emerging clean energy sectors. Ongoing regulatory reforms and a “just transition” framework aimed at workforce alignment provide a model for managing socio-economic impacts.

Collectively, these cases demonstrate that while national contexts differ, successful transitions are consistently underpinned by enabling policy environments, institutional capacity, and strategic coordination.

Delivering on GST and C-SERMS objectives will require a rapid scaling of implementation. Achieving the region’s 2030 targets will necessitate the addition of approximately 1,300 –2,000 MW of renewable capacity, implying significant annual

growth rates in the latter part of the decade. While technically feasible, this transition demands a coordinated regional approach, as such, three immediate priorities emerge. First, institutionalizing data transparency through platforms such as sieCARICOM is essential to support planning, monitoring, and investment. Second, C-SERMS must be updated and operationalized to strengthen its role in harmonizing regulatory frameworks, coordinating capacity-building, and facilitating joint procurement. Third, expanding access to blended finance mechanisms will be critical to improving project viability and mobilizing the estimated US$5 –7 billion required for the region's transition.

Integrating GST targets within NDCs provides a practical mechanism to advance these priorities. Beyond improving coherence and accountability, this approach enables the development of comprehensive investment strategies aligned with international climate finance. Well-structured, scalable project pipelines will be essential to attracting both public and private capital.

The Caribbean's energy transition is both a necessity and an opportunity. By addressing structural barriers and leveraging regional cooperation, the region can build energy systems that are more resilient, sustainable, and economically competitive. The pathway to 2030 will require urgency, coordination, and sustained political commitment. However, with the right alignment of policy, finance, and institutional capacity, the Caribbean is well-positioned not only to meet its targets, but to demonstrate how small island developing states can lead in the global energy transition.

From vulnerability to leadership, the Caribbean's energy transition has the potential to redefine its development trajectory while contributing meaningfully to global climate goals.

Table of Contents

Introduction and Scene-setting

In 2015, 195 countries adopted the Paris Agreement, a legally binding global response to the climate crisis. The goals of the Paris Agreement are clear. Governments worldwide agreed to (among other things):

a) hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;
b) Increase the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and
c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.[1]

In order to achieve the long-term temperature goal set out above, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty.[2] To do this, Parties prepare and submit Nationally Determined Contributions (NDCS) every 5 years, which represent their mitigation and adaptation commitments in line with the aforementioned goals.[3]

Despite growing recognition of the climate crisis, current NDCs are not sufficient to keep global warming within 1.5°C. The UNFCCC's NDC Synthesis Reports, (2021 – 2024) which compile information from Parties' submitted NDCs, indicate progressively increasing ambition over time, but also underscore a **significant implementation gap and need for increased ambition.**[4] Furthermore, the reports are based on an assumption of **full NDC implementation by all countries and explicitly recognise that in order to achieve peaking, the conditional elements of the NDCs need to be implemented**. This depends mostly on access to enhanced financial resources, technology transfer and technical cooperation, and capacity-building support; availability of market-based mechanisms; and absorptive capacity of forests and other ecosystems.[5]

1 See the Paris Agreement, Article 2. Accessible here:
2 See the Paris Agreement, Article 4.1
3 See the Paris Agreement, Article 4.3
4 2021 NDC Synthesis report
5 2024 NDC Synthesis report

Building on this however, the IPCC's AR6 Synthesis report finds that several mitigation options, notably solar energy, wind energy, electrification of urban systems, urban green infrastructure, energy efficiency, demand-side management, among others, are technically viable, are becoming increasingly cost effective, and are generally supported by the public.[6] Additionally, AR6 states that from 2010 to 2019, there have been sustained decreases in the unit costs of solar energy (85%), wind energy (55%), and lithium-ion batteries (85%).[7] Finally, **it underscores that the adoption of low-emission technologies lags in most developing countries due in part to limited finance, technology development and transfer, and capacity**.[8] These challenges must be addressed to ensure that Caribbean SIDS are not left behind in the transition to net-zero.

These findings have informed the negotiations over the Paris Agreement's "ambition mechanism" - **the Global Stocktake (GST)** – which takes stock of implementation of the Agreement to assess the collective progress towards achieving its goals. The GST:[9]

- Evaluates whether the world is on track to meet the Paris Agreement's goals
- Identifies gaps in ambition and implementation
- Encourages countries to enhance their climate commitments in response to scientific evidence
- Provides political momentum for stronger action at national and international levels.

Thus, the GST acts as both a diagnostic tool and a catalyst for more ambitious climate action.

In 2023, Parties completed the first Global Stocktake at the 28th Conference of the Parties (COP28). **This decision was crucial as it reaffirmed the global commitment to the Paris Agreement's goals, emphasizing the need for urgent action and support in this critical decade**.[10] Overall, the decision represents a global acknowledgement that we are not on track to meet the goals of the Paris Agreement, that this would be dire in terms of climate impacts, and the need to double down on implementation in order to keep the 1.5°C goal within reach. In addition, the decision explicitly acknowledges the scientific findings explained above. Such an outcome has potential to accelerate Paris Agreement implementation, given the current gap and the severe climate impacts being experienced by the most vulnerable countries, such as small island developing states (SIDS).

[6] IPCC AR6, paragraph A4.2
[7] IPCC AR6, paragraph A4.2
[8] IPCC AR6, paragraph 4.5
[9] See the Paris Agreement, Article 14.1
[10] Decision 1/CMA.5

Importantly, the GST provides vital insights for enhancing NDCs, strengthening adaptation efforts, and scaling up climate finance commitments. The GST encompasses three interconnected thematic areas: **mitigation, adaptation, and means of implementation and support**.

- Mitigation involves reducing greenhouse gas emissions to limit global warming
- Adaptation focuses on strategies to manage climate impacts and enhance resilience, and
- Means of implementation includes financial resources, technology transfer, and capacity building.

This report focuses on **paragraph 28 of decision 1/CMA.5**, which provides a roadmap for accelerating decarbonisation globally, in support of achievement of the long-term temperature goals of the Paris Agreement.[11] Paragraph 28 emphasizes the need for significant, quick, and ongoing reductions in greenhouse gas emissions to meet the 1.5°C target and urges governments to support global initiatives to speed up the energy transition. Specifically, it calls on Parties to contribute to the following global efforts, in a nationally determined manner:

a. Triple renewable energy capacity globally and double the global average annual rate of energy efficiency improvements by 2030;
b. Accelerate efforts towards the phase-down of unabated coal power;
c. Accelerate efforts globally towards net zero emission energy systems, utilizing zero- and low-carbon fuels well before or by around mid-century;
d. Transition away from fossil fuels in energy systems, in a just, orderly and equitable manner, in keeping with the scientific target of net-zero by 2050;
e. Accelerate the deployment of zero- and low-emission technologies (renewables, nuclear, carbon capture and utilization and storage), particularly in hard-to-abate sectors, and low-carbon hydrogen production;
f. Accelerate and substantially reduce non-carbon-dioxide emissions globally, including in particular methane emissions by 2030;
g. Accelerate the reduction of emissions from road transport on a range of pathways (development of infrastructure and rapid deployment of zero- and low-emission vehicles).
h. Phase out inefficient fossil fuel subsidies that do not adequately address energy poverty or a just transition;

The above aims for urgent emission reductions and a fair transition, enabling all nations to contribute to global climate objectives. Implementing these directives is essential for staying on the 1.5°C pathway and achieving net-zero emissions by mid-century. As

11 Decision 1/CMA.5

such, **the recommendations of this report focus on the implementation of paragraph 28A in the Caribbean region**, at a foundational level.

Setting the Context – C-SERMS

For any country, implementation of the GST energy package necessitates **comprehensive planning, sizable financial investments, and performance management mechanisms** to ensure the accountability and commitment of governments and stakeholders to the renewable energy transition. For the countries of the Caribbean Community (CARICOM), which are the subject of this report, **significant gaps in technology, technical capacity and finance as well as structural barriers must also be overcome before they can fully advance in the energy transition**.

Furthermore, there are no existing studies that assess GST implementation in CARICOM countries, in light of their current circumstances and existing climate targets. This presents an important opportunity to fill a gap that might assist Caribbean countries with Paris Agreement implementation, in a manner that builds on existing frameworks, networks and institutions.

The Caribbean Community's current energy landscape

CARICOM countries are minor greenhouse gas emitters, with their emissions over the last decade representing about 0.1 – 0.16% of the global percentage[i]. Despite their negligible contribution to the climate crisis, Caribbean countries find themselves on the frontlines of the worst and most devastating climate impacts[ii]. Their vulnerability to climate change is only worsened by structural and economic challenges such as high-debt burdens, limited fiscal space, constrained access to imported resources… such as a six percent (6%) increase in dryness, 0.85 – 1.5°C hotter temperatures, and the significant possibility of an eighty percent (80%) increase in the frequency of Category 4 & 5 hurricanes between the 2030s and the turn of the century[iiiiv]. Nevertheless, the region has demonstrated active leadership in the fight against climate change, as evidenced by submission of Nationally Determined Contributions, adoption of regional climate targets, implementation of regional coordination mechanisms and national environmental policies[v].

However, despite their clear commitment to addressing climate change, the region's energy transition is slow, and progress reports show only incremental renewable energy capacity growth. The energy landscape is plagued by disproportionately high electricity costs, which restricts energy access and in turn constrains economic development, places undue strain on public finances, and impacts the competitiveness of key industries such as tourism[vivii]. Progress has been defined by small-scale renewable projects that suffer from high political, regulatory, technical, and financial risks as well as outdated utility systems[viii]. Furthermore, due to their size and lack of upgrades, the region's power distribution grids suffer from chronic undercapitalization and vulnerability to extreme climate change related weather events[ix]. All of the above creates uncertainty for political leaders in their consideration of abandoning existing structures.

Compounding these challenges, is the Caribbean's heavy reliance on imported fossil fuels (mainly diesel). This exposes the region to the volatility, inflation and disruptions inherent to oil and gas markets[x]. There are a few exceptions such as Trinidad and Tobago, Guyana, and Suriname, which have fossil fuel resources. These territories tend to attract more private investments than the rest of the region that often struggles to secure the necessary capital for energy infrastructure improvements[xixii].

To address these challenges, the energy transition, must be preceded by a review of existing Policy, Regulatory and Legal frameworks to create alignment with desired goals and determine what additional policy tools are necessary to facilitate same. Following the creation of an enabling policy framework that addresses barriers to generation from RE sources, net-metering and a reduction in fossil fuel usage, the transmission and distribution of electricity must undergo upgrades as well in order to adopt new energy sources and improve system efficiencies. Though this pathway does require additional funding beyond the acquisition of renewable based generation, without modernized and upgraded electrical grids, even the most ambitious renewable energy projects will struggle to integrate into existing infrastructure[xiii]. All these steps must be considered to effectively reduce the region's exposure to economic shocks and enhance energy resilience.

C-CERMS and the goal of "Net-Zero"

Work has already been underway within CARICOM to address some of the aforementioned challenges. For example, in 2009, Caribbean governments adopted the Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS) at the 20th Inter-Sessional Meeting of the Conference of Heads of Government of the Caribbean Community (CARICOM). C-SERMS serves as a regional framework to guide energy sector transformation across member states as a part of a broader CARICOM energy policy. Focusing on increasing renewable energy adoption and improving energy efficiency, the framework is one of the Caribbean's responses to climate change. It is ultimately designed to assist CARICOM nations in meeting their revised renewable energy targets as well as to address certain climate change threats such as those mentioned in the previous section.

Since its establishment, C-SERMS recommends a marked increase in the use of renewables in the Caribbean. The framework proposed a timeline for the targeted rollout of RE capacity across the region, proposing that by 2017, the region's RE generating capacity should stand at 20%, increasing to 28% by 2022 and achieving 47% by 2027. Given that the actual achieved current capacity (2022) stands at 12%, this now means achieving a 35% increase over the next two years to achieve the 2027 target. Ultimately, this requires eliminating barriers and securing financing to achieve the rapid development of renewable energy projects.

Structuring the Change

The C-SERMS framework strategy was divided into two distinct phases and executed with the support of the Inter-American Development Bank (IDB) and the German Agency for International Cooperation (GIZ). The phases were:

- Phase 1 – An IDB funded preliminary review of the existing renewable energy environment and the development of initial targets and baselines.
- Phase 2 – A GIZ funded study of detailed RE and EE assessments and the development of support tools, which began in 2013, and the findings published in 2015

The framework was designed to offer technical assessments, promote policy coordination among CARICOM member states, and guide investment strategies to facilitate a regional energy transition. By adhering to the framework, it is believed that member states would benefit from:

- Clear Regional Targets - C-SERMS provided member states with structured and measurable targets, fostering a unified regional approach to energy transformation.[xiv]
- International Recognition - The framework is recognized as an international best practice by the Inter-American Development Bank (IDB), reinforcing its credibility.[xv]
- Performance Reporting– By 2022, the CARICOM region achieved 12% renewable energy penetration, reflecting steady improvement in line with C-SERMS guidance.[xvi]

Figure 2 below highlights the proposed C-SERMS renewable energy capacity targets for CARICOM members:

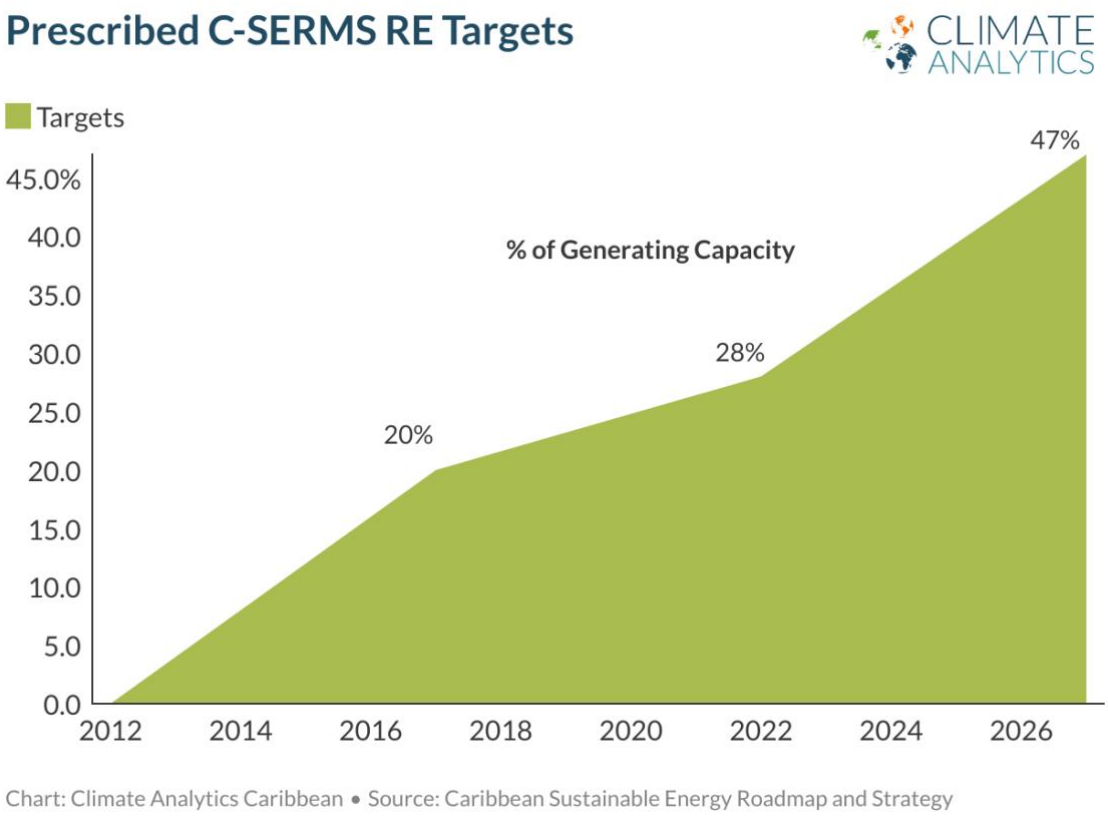


Figure 2:C-SERMS Renewable Energy Targets

This report utilises the C-SERMS framework and will serve as a proxy for GST implementation in the region for the following reasons:

- It is an already existing framework, that provides a basis to build on existing initiatives in the region rather than re-inventing the wheel and thereby creating additional administrative and financial burden.
- It represents a fair increase in renewable energy, given that the region's emissions are negligible and that full achievement of the 47% target would more than triple renewable energy for the region.
- It provides important information that can be used a baseline for renewable energy planning.
- It is a regional framework, and this report proposes to approach energy transition at a regional level due to the potential to increase attractiveness and ease of implementation.

Methodology and assumptions

The proposed pathways presented in this report and the accompanying country briefings were produced using a step-by-step method to calculate the level of renewable energy deployment needed to meet electricity demand growth and phase out fossil fuels in the region. Some data sources under consideration were:

- Any published studies conducted on the various territories that make up the region, that can define the developmental goals related to power sector/system reform;
- Guidance from assessments developed and published by regional entities on clean energy potential, and;
- Existing regulatory and policy structures that facilitate the clean energy transition

The available data sourced was then analysed using the following process:

a. A desktop review of any existing regional and national frameworks, that enable, renewable energy adoption, carbon emissions reduction/net-zero and energy transition.
b. Assessment of the current potential for renewable energy in the region, disaggregated by island based on published data.
c. Assessment of the progress of renewable energy deployment for the region, noting the current split between generation and generation from fossil fuel sources.
d. Determination of the current demand for electricity in the region as well as projected demand, taking note where possible of any plans for the electrification of Transportation sectors
e. Identification of gaps between current renewable energy targets and the achievement of net-zero
f. Development of LEAP models for each island state to project the effectiveness of existing and proposed measures if the data is available.

This method is a modified version of the method previously documented in the 2024 Climate Analytics report on Wind and Solar benchmarks[xvii]. The adoption of this approach is a direct result of the lack of readily available analysis of the needs of Caribbean SIDS. This also follows best practice by taking guidance from the IEA's net-zero scenario[xviii]. The IEA's scenario provides valuable advice as it captured at a global scale, required general improvements to power sectors, fossil fuel-based power generation phase out scenarios, and the potential level of renewable energy development that can be tapped into. To further define the parameters of this analysis, the targets and progress to date by regional players will be viewed through the lens of the Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS), as explained above.

Assumptions

As explained above, the C-SERMS target is used as a proxy for tripling renewable energy in the region. It provides a base year and baseline capacity for analysis, is already being implemented, and based on current targets, an increase from 12% to 47% of renewable energy capacity represents more than a tripling (36%) for the region. It also represents a fair share renewable energy increase given that the region has negligible greenhouse gas emissions.

This report also acknowledges that the deployment of potential renewable energy resources will vary from island to island, depending on various factors; mainly energy type, cost assumptions, societal and political desire, as well as the readiness of existing power systems to integrate and accommodate the limitations and advantages of a suitable RE power source. As previously noted, this section of the report looks at CARICOM's potential, analysing the available data on all possible clean energy sources available to its members. Consideration will be given however to each island's individual dynamics and requirements in annexed country summaries.

Limitations

Other reports examine the pathways that countries can take for effective RE deployment in line with the 1.5°C warming limit. However, the countries featured in these reports, such as the 1.5 °C Pathways report published by Climate Analytics, are larger (land mass) and often more economically developed than most SIDS. Thus, a significant limitation of this report was access to updated and available data to complete extensive modelling. During the data compilation phase of the project, it was observed that data availability, quality and scope varied from country to country. This misalignment challenges the ability to develop a standardised model for the region, necessitating the development of a common data standard and repository.

Key Findings - Aligning Caribbean Targets with 1.5°C

Based on the above methodology, achievement of the 2027 C-SERMS target (and thus a tripling of existing renewable energy capacity) means the following:

- renewable energy capacity in the region **would need to achieve a further 35 percentage point increase from 2022 levels to achieve the C-SERMS average capacity target of 47% by 2027**
- the region collectively would need to install **approximately 1300MW of RE generating capacity to achieve a tripling of RE capacity,** and if the intended 2027 C-SERMS target is to be realised (47% share of renewables), that addition **increases to 2000MW**.
- **rapid RE deployment must occur between 2028 -2030** to meet the C-SERMS targets and thus triple renewable energy capacity in the region.
- for the path to net-zero by the middle of the century, **the region will have to consider little to no further development of hydrocarbon-based electricity generation**

As of 2022, the Caribbean is not on track to meet its current C-SERMS targets. Currently, the region has achieved 12% of electricity being generated from renewable energy sources. This falls short of the targeted 47% by 2027. **Thus, achieving the above will require a significant increase in renewable energy deployment in a short period of time. Doing so necessitates greater access to funding, technical competency and accelerated policy development which places additional strain on governments that are saddled with the challenge of meeting the everyday needs of their populations**.

Furthermore, in this acceleration of the clean energy transition, governments must also consider that energy demand in Latin America and the Caribbean is forecasted to increase by 2.7% per annum[xix]. The forecasted growth in energy demand in Latin America and the Caribbean provides the context for the required increase in renewable generation in line with the global target of net-zero. Primarily the data indicates that fossil fuel-based generation (diesel, fuel oil and natural gas), still dominates the region's energy matrix with renewable energy additions directed at bolstering existing supply to meet demand rather than replacing in support of the transition to net-zero.

To achieve a net-zero scenario, **the region must approach renewable energy deployment with the goal of reducing/eliminating the existing fossil fuel generation**, whilst also designing additions to account for demand growth that may occur during an energy transition. For example, demand from transport sectors is envisioned to grow by 4% annually out to 2027[xx] and thus plans for addressing this projected demand using clean energy sources would need to be incorporated into the transition approach. Thus, the deployment of these clean energy resources must be strategically planned to ensure that baseload demand, or the minimum amount of electrical generation to ensure that basic round the clock services and systems have power, is effectively provided, reducing the population's exposure to outages.

This increased renewable energy capacity must also be implemented in a manner that ensures that the power distribution system does not operate in an uneconomical manner. Any large imbalance between the supply and demand of power should be managed and or avoided. For example, a common characteristic of Power Purchase Agreements (PPA), the arrangement that usually covers commercial power generation, is language that obligates the utility to pay generators for their generating capacity, even if the power is not being generated and distributed[xxi]. As such, utilities can become financially exposed if capacity additions are made without effectively phasing out less efficient or fossil fuel-based generation systems, which should be avoided in the transition.

Can the Caribbean achieve the 1.5 aligned RE targets in the near term?

Achieving the targets set out in the C-SERMS framework relies on the realization of the renewable energy potential for each of the CARICOM islands.

The pursuit of this regional C-SERMS target for RE capacity requires consistent and deliberate action on the part of regional leaders. **In the next two years 2026-2027**, the region will have to:

i. **address obstacles to progressing deployment (policy, regulatory, etc.),**
ii. **develop a strategy for acquiring funding and**
iii. **create investor quality data packages for each of the member states.**

This will precede a **required period of rapid deployment across the region of projects to meet the approximate 20% yearly increase required during 2028 -2030** to meet the C-SERMS targets and by proxy implement the GST in the region. **For the path to net-zero by the middle of the century, this must increase to 50% by 2035, with no further development of hydrocarbon-based electricity generation.** More information on the current barriers to achieving this accelerated growth is provided in the following sections.

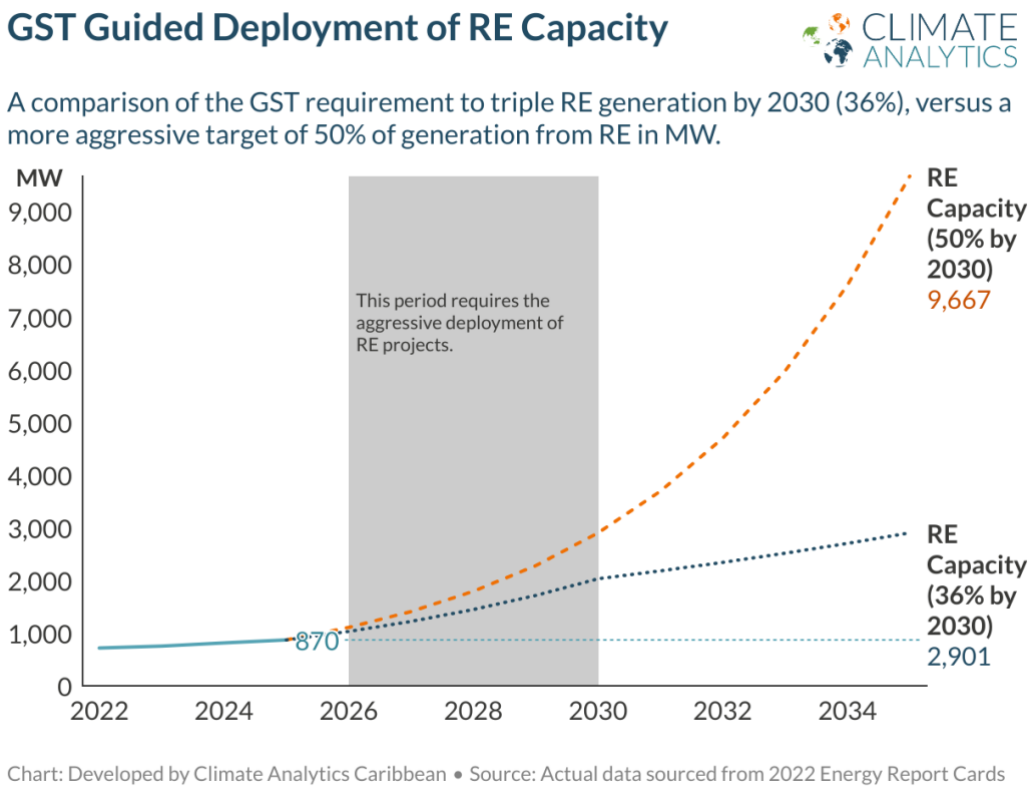


Figure 4: GST guided deployment of RE Capacity

The 2022 issue of the CCREEE ERCs breaks down the region's updated RE potential by technology as displayed in Figure 3. Based on the data in the energy report cards, wind and solar dominate as the most prevalent RE sources given the abundance of both in the region. The other energy Sustainable Energy Resources (SER) noted in the report cards are localised to specific territories and not general to the entire region.

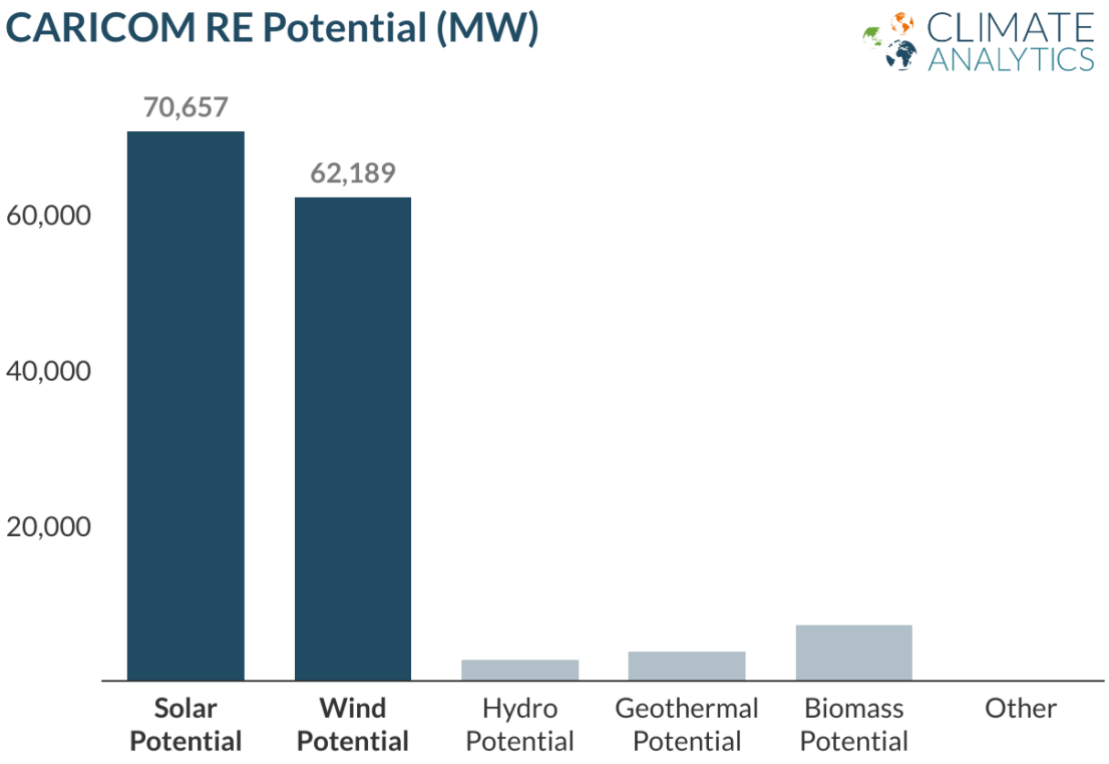


Figure 3: CARICOM Renewable Energy Potential

Barriers to tripling renewable energy in the Caribbean by 2030

The shortfall in achievement of the region's renewable energy targets indicate **a need for improvements in policy and regulatory frameworks, creation of an enabling environment that provides adequate technical competencies, access to finance and an improved ease of doing business**. These improvements combine to increase the region's attractiveness for green private investment as countries implement clean energy projects.

The discussion below provides further detail on some of the barriers that need to be addressed for the region to be successful in implementing the GST. The following section discusses recommendations on how to address these barriers.

Regulatory and Institutional Barriers

Based on a review of existing regional policies and regulatory frameworks, Caribbean SIDS are hindered by fragmented or underdeveloped regulatory frameworks, as well as differing priorities in national energy policies. An example of fragmentation in this regard can be seen in countries like Trinidad & Tobago, where the power utility falls under one ministry, power generation falls under another, and the country's management of the NDCs and multilateral funding opportunities are administered by yet another ministry.

Furthermore, the processes for acquiring the required licensing to implement renewable energy projects are often poorly communicated and lack rigour, resulting in delays that create doubt for potential investors and project developers, discouraging them from successfully delivering an economically sound project[xxii]. These challenges impede the possibility of harmonised regional progress and limit the pooling of resources[xxiii], a condition that addresses a financial risk by improving the project cost related risks of investment. Without a shared vision, fully documented process and reporting structure, each entity's priorities, if not aligned, become hinderances to the development of coherent energy strategies[1].

As it pertains to governmental coordination, **countries require increased and improved coordination between national utilities, regulatory agencies, and government ministries**.

Limits of Existing Grid Infrastructure

A country's electric grid is a delicate ecosystem of generating assets, distribution managers and administrative decision makers, collaborating to provide a reliable and safe electricity supply to the citizenry. Many Caribbean countries are facing an aging electric infrastructure that is operating well beyond its design limits. The lack of grid modernization, such as advanced metering and smart grid technologies, restricts the ability to integrate variable renewable energy like wind and solar[xxiv].

Upgrading to a modern smart grid, which involves the adoption of new supervisory communication and control systems that communicate effectively with each other, and the main control operation provides an energy efficient management platform that:

- reduces peak loads,
- easily adapts to the integration of renewables.
- efficiently manages storage systems and,
- lowers operational costs and allows those savings to be passed on to the customer.

The cost considerations for a grid upgrade can be daunting, as it involves required upgrades to the network's cyber security measures. However, it is an important element in the implementation of a low emission, efficient and reliable energy management network.

Financing and Investment Risks

In order to truly scale renewable energy deployment in the region, Caribbean SIDS will require private finance. This is due to the classification of many Caribbean SIDS as middle-to-high income countries, which makes access to concessional financing a major barrier for renewable energy projects. However, relying on private finance is challenging for Caribbean countries, because of the risk-factor and the cost of capital.

Caribbean islands have unfortunately historically fallen victim to the perception of high political, technical, and financial risk by private investors[xxv], often having to make large concessions that do not always return full benefits to the country. Private financiers also often lament that project preparation costs are high relative to project size, making small-scale renewable initiatives less attractive to investors[xxvi].

Therefore, **unlocking renewable energy at scale will require not only innovative financial instruments and risk mitigation strategies, but also targeted policy reforms that build investor confidence while ensuring equitable returns for Caribbean communities**.

Continued Dependence on Fossil Fuels

In 2005, PetroCaribe, a regional oil agreement, was established to provide 18 Caribbean and Central American member countries with cheap, long-term oil financing from Venezuela[xxvii]. It was envisioned at that time that the agreement would foster social and economic development, leading to improved food security and poverty reduction. Due to geopolitical landscape changes, PetroCaribe has suffered setbacks, however, it has resulted in a deep-seated dependence on imported diesel and heavy fuel oil for electricity generation.

Fossil fuel lobbies, existing subsidies and concessions that promote fossil fuel use, and infrastructure systems that though outdated, represent significant investment by the host country, are important impediments to the energy transition in the region. **These can only be addressed through policy and regulatory changes that are dependent on the political will and technical capacity of island governments.**

Institutional and Human Capacity Constraints

A certain level of commercial and technical experience is required to evaluate and negotiate mutually beneficial project arrangements. There is a deficiency in the availability of local expertise in design, operation, integration and maintenance of renewable energy projects across the region. To respond to this, **regional centres of learning have either developed or are in the process of developing appropriate degree programs and technical certifications to develop a pool of expertise with the technical capacity to evaluate and approve projects or to negotiate with international financiers and developers.** Some of these programs include the Institute for Technical and Vocational Education and Training's (ITVET) Renewable Energy & Efficiency Program, or Arthur Lok Jack Graduates School of Business' MBA in Sustainable Energy Management.

“Bankability” of Projects

Despite growing interest to adopt clean energy sources in the region, the projects required to make the desired step are stymied by a perception among private investors of projects being not “bankable”. Such a perception means that there is a lack of required data to facilitate analysis and development of a project implementation plan, introducing unwanted risk into a project. Common issues faced by “un-bankable” projects are:

- Unclear land rights
- Insufficient feasibility studies
- Lack detailed national energy audits
- No Wind Resource Assessments/ Solar Irradiance Studies
- A lack of off-take agreements for the generated power. Climate Vulnerability and Natural Disasters

The Caribbean region has become susceptible to stronger and more severe extreme weather events such as hurricanes, and prolonged periods of drought, resulting from climate change. According to the Climate Studies Group at the University of West Indies Mona Campus, it is forecasted that Caribbean SIDS may be facing a future where the region is six percent (6%) drier, will experience a 0.85 – 1.5°C hotter temperatures, and be affected by an eighty percent (80%) increase in the frequency of Category 4 & 5 hurricanes between the 2030s and the turn of the century[xxviii]. These extreme weather events pose a threat to energy infrastructure, which incurs higher insurance premiums, discouraging investment, and emphasizing the need for well-engineered, resilient energy systems. This requirement adds cost to the project and increases the complexity of execution[xxix].

Policy recommendations to address barriers

Based on the above findings, it is recommended that the C-SERMS framework be updated to meet the changing needs and challenges to the region. This section will explore avenues to overcoming these barriers within the energy transition space according to the areas identified in Figure 4 below.

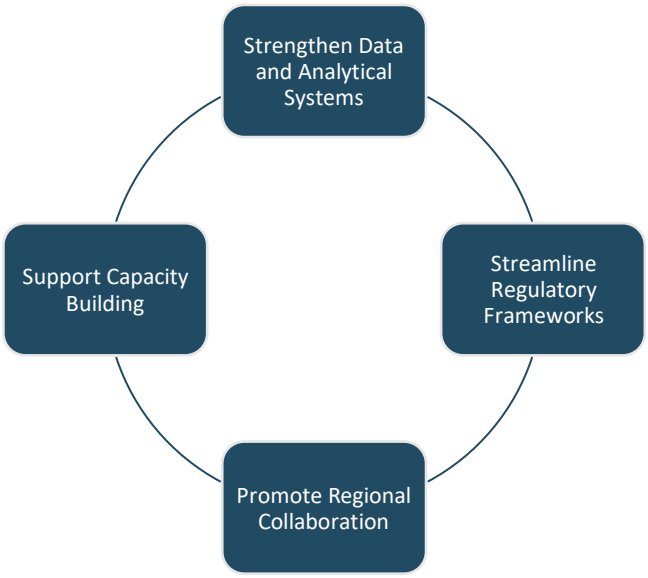


Figure 5: Possible C-SERMS Improvement Areas

1. Strengthen Data and Analytical Systems

A challenge faced in developing this report was access to updated and pertinent data as it pertains to the various parameters that contribute to the development of RE deployment assessments for the Caribbean SIDS.

Recommendation: As signatories to the C-SERMS framework, CARICOM members should align to an agreed standard of operation, with regards to reporting on technical assessments and the submission of progress reports.

Method of implementation: By utilising an already available entity, empower CCREEE to:

i. Expand the scope and reach of the CARICOM Energy Information System (sieCARICOM), that was developed in conjunction with the Latin American and Caribbean Energy Organization (OLACDE)[xxx] to cover additional CARICOM member states. The initiative has developed a standardized data repository based on previous work executed by OLACDE and offers an opportunity for improved analysis and decision making.
ii. Optional (but recommended) – explore the use of Artificial Intelligence and automation to optimise the provision of updates by member states and create automated linkages to recognized and trusted regional models.

Expanding access to these mechanisms for data collection, analysis, management and reporting, all assist in improving transparency for investors, and effective progression tracking by regional experts. This supports the move towards providing bankable data to investors and funds when pursuing financing for projects.

2. Streamline Regulatory Frameworks

The individual regulatory processes unique to each member state often carry the stigma of being fragmented, slow moving and overly bureaucratic. As a region that is trying to market itself for green investment, inconsistencies in the different policy environments create uncertainty, thus discouraging private sector involvement and delaying project development. Many islands still operate their electricity grids under the control of a single utility, which operates under the guidance of outdated legislation**. It is imperative the regional governments assert a position of deliberate action and display a strong political will to eliminate barriers to the progression of the energy transition.**

Recommendation: Regional legislation covering the generation of electricity should evolve to encourage the inclusion of RE sources and encourage decentralised generation[xxxi].

Method of implementation: Expand the reach of C-SERMS, via agents such as the Caribbean Community Climate Change Centre (CCCCC) and CCREEE, to act as consulting agencies to provide reviews of member state's legal frameworks and permitting processes to develop harmonized regulations, that respect each country's unique challenges yet still promotes more efficient inter-agency cooperation (regionally & nationally). This can remove bottlenecks that typically result in extended timelines and increased transaction, further improving the attractiveness of the region to investment[xxxii].

3. Support Capacity Building

With the exception of territories that already have an active energy sector, there is a shortage of local expertise in renewable energy system design, operation and maintenance. There is a steep learning curve associated with the technical and commercial evaluation of projects as well as the required negotiations with financiers and developers to move a project to the point of Final Investment Decision (FID). Currently, Governments relay on external consultants to draft policies, assess project feasibility and negotiate required Power Purchase Agreements.

Recommendation: To avoid reliance on these external entities and mitigate the risk of slowed internal capability development and increased project costs, investing in technical training and institutional capacity building for Caribbean nationals is the only avenue to ensuring the sustainability of regional renewable energy systems[xxxiii]. A CCREE developed 'C-SERMS curriculum' that identifies the gaps and collaborates with regional learning institutions to amend/develop programs for Caribbean nationals, offers avenues for governments to upgrade the required skillsets of their professionals.

4. Promote Regional Collaboration

Smaller projects find it challenging to attract investment due to their size and limited capacity for return on investment. By marketing the collective desire of CARICOM to transition to clean energy and offering the opportunity to invest in the collective RE requirements of the region, the investment is transformed from a small project to a large regional undertaking that a sole supplier would perceive as a significant business opportunity.

Recommendation: The creation of shared procurement mechanisms, and regional project development processes in the advancement of energy transition targets.

Method of implementation: Achieving this is no simple task as CARICOM leaders would need to agree on allowing under C-SERMS, the creation of a Special Purpose Vehicle (SPV) or Project Agency, which is authorised to represent the region's collective interests and secure funding that matches the region's development needs. This agency or SPV would use C-SERMS developed joint procurement mechanisms and regional project development standards to leverage the benefits associated economies of scale, allowing each island to access funding that was originally unavailable[xxxiv].

Conclusion

The C-SERMS framework provided a starting point for advancing renewable energy development in the Caribbean and expressed an intention by regional leaders to address emissions reductions as well as energy sustainability and security. Its structured targets and regional vision have facilitated moderate progress to date, still the imperative to progress towards greener energy solutions has evolved and demands more action. Caribbean SIDS now require rapid deployment of renewable energy capacity over a short period of time to achieve their updated renewable energy objectives. This requires a shift in C-SERMS from a prescriptive role to one more operational in nature, that offers enhancements in implementation support, regulatory reform, and regional coordination. Addressing these areas will enable the region to more effectively work towards energy security and climate and economic resilience in the Caribbean.

In the following Appendices, individual country reports will assess the regulatory frameworks that have been enacted to support Caribbean countries in the achievement of renewable energy targets, and also offer possible regulatory and policy options for consideration.

References

[i] ECLAC. 2024. Caribbean Outlook: Considering a Caribbean emissions trading scheme. https://repositorio.cepal.org/server/api/core/bitstreams/a1edf1e3-825d-4428-956d-f594b4a07c36/content#:~:text=It%20is%20noteworthy%20that%20from,(World%20Bank%2C%202023)

[ii] Thomas, Adelle and Baptiste et al. (2020). Climate Change and Small Island Developing States (Annual Review of Environment and Resources, Vol. 45, pp. 1-27, 2020. http://dx.doi.org/10.1146/annurev-environ-012320-083355

[iii] Caribbean Development Bank and The University of the West Indies (Mona). The State of the Caribbean Climate. http://socc.mona.uwi.edu/sites/default/files/The%20State%20of%20the%20Caribbean%20Climate%20Report.pdf

[iv] Thomas, Adelle and Baptiste et al. (2020). Climate Change and Small Island Developing States (Annual Review of Environment and Resources, Vol. 45, pp. 1-27, 2020. http://dx.doi.org/10.1146/annurev-environ-012320-083355

[v] Climate Analytics, CCREEE. (2025). Powering progress together: why regional collaboration is the key to hitting our renewable targets. Climate Analytics Caribbean. https://climateanalytics.org/news-and-events/news/powering-progress-together-why-regional-collaboration-is-the-key-to-hitting-our-renewable-targets

[vi] World Bank Blogs. (2023). The Caribbean's clean-energy potential: From fuel trap to resilient hub. https://blogs.worldbank.org/en/latinamerica/caribbean-clean-energy-resilient-hub

[vii] Ahmed, M. M., & Shimada, K. (2019). The effect of renewable energy consumption on sustainable economic development: Evidence from emerging and developing economies. DOI:10.35784/pe.2022.1.25

[viii] Atlantic Council (2023). A roadmap for the Caribbean's energy transition. https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/a-roadmap-for-the-caribbeans-energy-transition/?_thumbnail_id=684876#:~:text=the%20roadmap%E2%80%99s%20steps.-,Drivers%20of%20the%20Energy%20Transition%20and%20System%20Transformation

[ix] International Monetary Fund. (2017). Unleashing Growth and Strengthening Resilience in the Caribbean – Chapter 13: Energy Diversification: Macro-Related Challenges. https://www.elibrary.imf.org/display/book/9781484315194/ch13.xml

[x] World Bank. (2012). Mitigating Vulnerability to High and Volatile Oil Prices: Power Sector Experience in Latin America and the Caribbean. https://openknowledge.worldbank.org/entities/publication/d61b71a9-fe87-5dfe-83a8-de96ced84a6f

[xi] Caribbean Council. (2024, October 4). TotalEnergies, APA make US$10.5 bn Final Investment Decision in Suriname. Caribbean Insight. https://www.caribbean-council.org/caribbean-insight/

[xii] International Monetary Fund. (2024). Energy Trends and the Green Energy Transition in Trinidad and Tobago. IMF Selected Issues Paper. https://www.elibrary.imf.org/view/journals/002/2024/151/article-A002-en.xml

[xiii] E3S Web of Conferences (2024) – Renewable Energy Integration in Modern Power Systems: Challenges and Opportunities. 591, 03002. https://doi.org/10.1051/e3sconf/202459103002

[xiv] CARICOM. (2015). Targets approved for renewable energy development and energy efficiency improvement in CARICOM. https://caricom.org/targets-approved-for-renewable-energy-development-and-energy-efficiency-improvement-in-caricom

[xv] CARICOM. (2022). C-SERMS framework hailed as international best practice by the IDB. https://caricom.org/c-serms-framework-hailed-as-international-best-practice-by-the-idb

[xvi] CARILEC. (2023). CARICOM Member States demonstrate strong progress towards renewable energy targets. https://carilec.org/caricom-member-states-demonstrate-strong-progress-towards-renewable-energy-targets

[xvii] New Climate Institute and Climate Analytics (2023): Wind and solar benchmarks for a 1.5°C world Climate Analytics Online: https://climateanalytics.org/publications/ wind-and-solar-benchmarks-for-a-1-5-cworld

[xviii] IEA 2023 Net Zero Roadmap (2023 update): A Global Pathway to Keep the 1.5 °C Goal in Reach – Analysis IEA Online: https://www.iea.org/reports/net-zero-roadmap-a-global-pathway-to-keep-the-15-0c-goal-in-reach

[xix] Inter America Development Bank. (2016). Lights On?: Energy Needs in Latin America and the Caribbean to 2040. https://publications.iadb.org/en/lights-energy-needs-latin-america-and-caribbean-2040

[xx] IEA. (2025). Electricity 2025: Executive Summary. https://www.iea.org/reports/electricity-2025/executive-summary

[xxi] World Bank. (n.d.). *Power Purchase Agreements (PPAs) and Energy Purchase Agreements (EPAs)*. PPP Knowledge Lab. https://ppp.worldbank.org/sector/energy/energy-power-agreements/power-purchase-agreements

[xxii] Blechinger, Philipp & Richter, Katharina & Renn, Ortwin. (2015). Barriers and Solutions to the Development of Renewable Energy Technologies in the Caribbean. DOI 10.1007/978-3-319-15964-5_24.

[xxiii] Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE). (2021). Energy Transition Strategy Reports. https://www.ccreee.org

[xxiv] International Renewable Energy Agency (IRENA). (2020). Transformation of the Caribbean power sector. https://www.irena.org

[xxv] Inter-American Development Bank (IDB). (2019). Mobilizing private finance for clean energy in Caribbean SIDS https://publications.iadb.org

[xxvi] Caribbean Development Bank (CDB). (2021). Study on Financing Renewable Energy Projects in the Caribbean. https://www.caribank.org

[xxvii] Atlantic Council. (2014). Uncertain Energy: The Caribbean's Gamble with Venezuela. http://www.jstor.com/stable/resrep03597.5

[xxviii] The Climate Studies Group, University of the West Indies (Mona). (2020) The State of the Caribbean Climate Report. socc.mona.uwi.edu

[xxix] World Bank. (2020). Building a resilient energy sector in Caribbean SIDS. https://www.worldbank.org

[xxx] OLACDE. (2024). The Caribbean community now has an Energy Information System – sieCARICOM. https://www.olade.org/en/noticias/the-caribbean-community-now-has-an-energy-information-system-siecaricom/

[xxxi] Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS). (2015). Baseline Report and Assessment – Phase I. Retrieved from https://fliphtml5.com/aupc/zlkx

[xxxii] Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS). (2015). Baseline Report and Assessment – Phase I. Retrieved from https://fliphtml5.com/aupc/zlkx

[xxxiii] United Nations Economic Commission for Latin America and the Caribbean (ECLAC). (2022). Caribbean energy transition readiness assessment. https://www.cepal.org

[xxxiv] Jamaica Observer. (2021). Green energy targets in jeopardy as regional collaboration lags. https://www.jamaicaobserver.com