CCREEE
CARIBBEAN CENTRE FOR RENEWABLE ENERGY & ENERGY EFFICIENCY

AN INSTITUTION OF CARICOM

SROPTTC-C (Siting Resource Off-takers Permits Technology Team Capital Construction): A Guide for Sustainable Energy Project Development

April 2021

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Glossary of Terms

CCCCC/5Cs – Caribbean Community Climate Change Centre
CCREEE – Caribbean Centre for Renewable Energy and Energy Efficiency
CDF - Caribbean Development Fund
CEKH- CARICOM Energy Knowledge Hub
CRAF - Credit Risk Abatement Facility
CROSQ- CARICOM Regional Organization for Standards and Quality
EE- Energy Efficiency
EER- Energy Efficiency Resource
EPC- Energy Performance Contract
GFTK- Green Finance Toolkit
IDB – International Development Bank
IRRP- Integrated Resource and Resilience Plan
NFI- National Focal Institutions
NREL – National Renewable Energy Laboratory
OECS – Organisation of Eastern Caribbean States
PPA- Power Purchase Agreement
PPF- Project Preparation Facility
RE- Renewable Energy
RER- Renewable Energy Resource
RMS- Resource Mobilization Strategy
SE- Sustainable Energy
SROPTTC – Siting, Resource, Off-taking, Permits, Technology, Team, Capital
SROPTTC-C – Siting, Resource, Off-taking, Permits, Technology, Team, Capital, Construction

Introduction and Objective

The SROPTTC is a risk minimization tool developed by the National Renewable Energy Laboratory (NREL) that defines seven core subject areas of renewable energy projects that influence strong project development. The seven core areas defined by the SROPTTC are: Site, Resource, Off-Take, Permits, Technology, Team and Capital. Each area can make or break project development, and as such, the tool is used to determine if a project has a fatal flaw or if the project is strong enough to attract investment and see completion. The tool is not meant for one-time use; it is meant to be used iteratively throughout the project development cycle – from project conceptualization to project completion and commissioning.

This publication seeks to present the Caribbean Centre for Renewable Energy and Energy Efficiency's (CCREEE's) adapted framework, the SROPTTC-C, with an added C that speaks to Construction. CCREEE's aim is to encourage project developers and project financers, primarily those interested in developing projects in the CARICOM Member States, to adopt this tool so that already limited resources are utilized wisely. With the use of this tool project flaws can be quickly identified and analyzed allowing for more efficient use of resources and an improved sustainable energy (SE) project development environment in the region.

By using this tool, project developers can make their renewable energy (RE) and energy efficiency (EE) ventures more attractive to project financers because the lower the risk in investment the greater confidence garnered by financers. The CCREEE has a Project Preparation Facility (PPF) that seeks to help project developers advance their sustainable energy projects to bankability and therefore attain project financing. Project developers can use the SROPTTC-C outline to guide their project development and applications when applying for assistance under the CCREEE PPF.

S- siting

Overview: Siting and its Importance

One of the most crucial parts of any renewable energy or energy efficiency project is the site or location. Selecting the best location for the project will have an impact on the cost of energy generation. For renewable energy projects, the criteria used to choose the location for the project will vary based on the energy source to be used.

For instance, solar photovoltaic, hydropower and wind powered projects require large land space while geothermal projects require less space. When considering a project site or location, energy efficiency initiatives should ideally consider the entire ecosystem of a building or other system. Depending on the energy audit requirements and availability of resources, systems may also be considered in sections.
The pre-development phase of any project explores its objectives and goals. During this stage, several activities are carried out including preliminary feasibility studies, cost analysis and planning. In the pre-development phase for siting, physical assessments and evaluations of the site/location considers several factors including but not limited to sloping, soil conditions, accessibility and resource availability. During this planning, other factors are considered such as:

- Financing options to obtain the site/location as well as other miscellaneous costs.
- Regulatory requirements needed to obtain the site such as property rights, policies and permits.
- Competition for the land (farming, other commercial activities)

The development phase of a project is collaborative and involves all parties, resources and relevant stakeholders required to implement the project. This stage can be time intensive but once completed, implementation can begin. For siting, accessing funding and obtaining the necessary legal requirements can be lengthy processes and may require several iterations. Once approvals are granted the construction may commence.

Key Considerations:

Listed below, are several significant factors that project developers should consider during the siting process, they include:

Technical:

- Abundance and availability of energy source by site – For example, a site chosen for a wind powered project should meet the criteria for maximum energy capture such as elevation (onshore and offshore)
- Infrastructure- Considerations should be given to positioning of power lines and other structures (civil and electrical).
- Replacement of major equipment- For example a Heating, Ventilation and Air Conditioning (HVAC) System that is located in a conceal environment.

- Accessibility- Consideration of road and infrastructure and transportation would reveal for instance, if a chosen location is more rural and incur added cost due to increased distance.

Social:

- Proximity to residential areas- The location should be situated a safe distance from any communities based on the application. A microgrid application would be closer while a large-scale project should be positioned further for safety concerns.
- Aesthetics- For wind powered projects turbines are extremely tall and have the potential to cast shadows on buildings etc.
- Considerations for surrounding end users

Environmental:

- Environmental impact – How the project implementation will affect any ecosystem (aquatic or terrestrial) or wildlife. For example, hydro projects will cause disruption in aquatic ecosystems as wildlife may get displaced during construction.
- Land- Consider competition for land use for instance for agriculture, residential, and commercial purposes.

Economical**:**

- Legal- Regulatory constraints (Consider regulations, Acts or Laws that may be in place for safety etc., as special licenses, permissions or grants may be required)
  Financial- Funding maybe required to purchase/lease the site.

Support Mechanisms

Project developers who require aid from the CCREEE should have a predetermined site/location or potential locations that can be further assessed for suitability. Based on assessments, recommendations may be provided from within the organization or external partners. Listed below, are several means to help developers, they include:

- Identifying potential sites and provide analysis of resource potential: IRRP, Thematic Hubs, NFIs, CEKH
- Engaging relevant agencies and local experts: NFIs

R- resource

Overview

Project sites can have different types of resources in varying amounts. The common RE resources found in the Caribbean are solar, wind, geothermal, hydropower, biomass and ocean technologies. EE projects would include an operational and/or equipment replacement to increase efficiency.

Projects that lack resources, or ones that have inefficient or inconsistent resources, can fail before development is complete or shortly after the completion of development. For each project resource being considered, an engineering assessment on that resource should be done at different stages of project development. It is important to note that the level of detail of the engineering assessments, and the confidence in those assessments will vary over the project cycle. In the initial stages a more general assessment will be made, for example early feasibility assessments. As the project develops the level of detail assessed increases.

An example flowchart showing the process of doing an early iteration of the resource assessment is shown in Figure 1.

Key Considerations:

Ultimately, the aim of the resource assessment is to increase the confidence in the knowledge of the resource present. To do so it would be best to try to define at least the following resource characteristics:

- The volume/frequency
- Variability characteristics
- 24-hour profiles
- Monthly, seasonal and annual variability
- Weather dependence
- Data history
- Standard deviation
- Technology sustainability

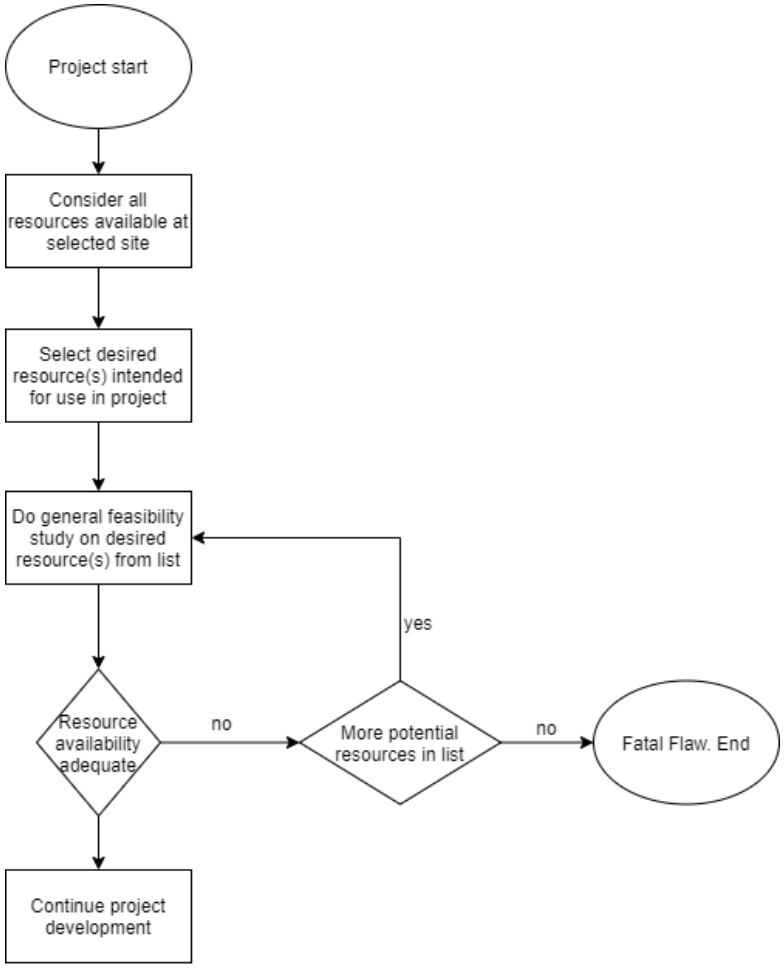

Figure 1

To gather the data to define the resource, it is important to know the preferred quality and format of the data required. Consideration should be made to potential data sources and how varying sources can affect reliability and skew confidence in the definition of the resource. Unfortunately, data available for assessment may not be ideal and may come with several complexities and nuances. For example, the site selected may not have periodic data at reasonable time intervals, the requested data may be inconsistent, or it may be presented in varied formats. Lack of data can prove

problematic because this process is data driven. Strong engineering and technical knowledge of the resource and region may be needed so that reasonable assumptions can be made where lack of data is present. Additionally, contingency plans need to be put in place should the received data be below the quality desired.

When assessing a resource, it is important to consider how risks and hazards may affect RER/EER availability and harnessing options.

Support Mechanisms:

The region has an abundance of resources that can be used to support the increased uptake of SE projects and decrease dependence on traditional fuels. With the ambitious targets set by various Member States, support mechanisms from the CCREEE and external partners can help with resource assessment.

Programmes within the CCREEE that can help developers include the CEKH, the IRRP, the Sustainable Building Programme and the Sustainable Business and Industry Programme. Through the CEKH, project developers can access resource and energy data that can be used to help with their resource definition; they can also utilize the CEKH and request specific reports to be done based on knowledge already in the Hub.

The IRRP is process that produces a report outlining recommendations for least-regret power system planning options geared toward Ministries, Utility Regulators and all other relevant stakeholders. The IRRP can be used by project developers to build around resources recommended in the finalised report. Project developers can receive EE assistance through the Sustainable Building Programme and the Sustainable Business and Industry Programmes. CCREEE also has partners with Thematic Hubs that can help with the analysis and definitions of specific resources. For assistance with bioenergy developers can look to the Caribbean Community Climate Change Centre (CCCCC), for assistance with hydropower the Thematic Hub is Guyana, Solar PV is UWI Mona Campus, Thermal is UWI Cave Hill Campus, E-Mobility is UWI St. Augustine Campus, Wind is Wigton Wind Farm in Jamaica, Geothermal is the Office of Eastern Caribbean States (OECS) and Quality Infrastructure is CARICOM Regional Organization for Standards and Quality (CROSQ). Additional support can be provided by Sustainable Energy Incubators.

O- off-taker

Overview:
Within the sustainable energy context, off-takers can be renewable energy (RE) power purchasers or/and beneficiaries of energy efficiency (EE) gains. Possible off-takers include utilities, businesses, industrial companies, and municipalities.

Agreements between sustainable energy project developers and off-takers may take the form of Power Purchase Agreements (PPAs) for RE generation or Energy Performance Contracts (EPCs) for EE initiatives.

Project developers should have a sound understanding of the interactions between their projects and off-takers. To be successful, project developers should begin engaging with potential off takers during the early stages of their projects as securing PPAs or EPCs before project implementation is critical to ensure a market for the project's future output. Moreover, PPAs and EPCs are often needed to advance to projects to financing and other late-stage development activities.

Key Considerations:
Considerations for developing PPAs and EPCs which meet the needs of both project developers and off-takers include but are not limited to:

- Financial
    - Electricity pricing and attached terms
    - Electricity price volatility
    - Property insurance
    - Energy production insurance
    - Off-taker's creditworthiness
    - Off-taker's insurance
    - Integrated Utility Service model
- Technical
    - Electricity produced
    - Volume risk
    - Curtailment risk of the RE project
    - Monitoring Reporting and Verification measures
- Environmental Attributes
    - Benefits of clean energy: accounting for positive externalities

- Regulatory/ Enabling Environment
    - RE market growth rate
    - Development risk

Support Mechanisms:

The CCREEE supports and facilitates project developer's efforts in establishing off-taker arrangements through a number of avenues. Some of these mechanisms may be sourced internally within CCREEE while others are offered through CCREEE's extensive network of regional organizations and partners.

Internally, as part of its sustainable energy project development support, the PPF facilitates linkages between project developers and potential off takers. Additionally, through the CEKH project developers may access information on key sustainable energy actors within each Member State, take courses on developing off taker agreements, and participate in the Community of Practice where project developers may connect with relevant stakeholders.

Externally, project developers can reach out and connect with sustainable energy incubators and utilities within CARICOM Member States (see Annex for a provisional list of organisations). Regional entities such as the Caribbean Electricity Utility Services can also aid in engaging with off takers.

P- permits

Overview:

The use of the land which has been identified for a SE project can be blocked by the regulations which govern said space. These regulations in the Caribbean context are usually distributed by a central body for each Caribbean country. This means that it would be necessary to research each country's regulatory body and hence develop roadmaps for the successful application for permits. Regulations provide standards which the project must meet. As such, these standards must be identified and worked into any technical design which the project undertakes.

It is then important to understand the necessary regulatory requirements for the project. To ensure this project managers can:

- Engage local experts to gain insight into the local permit framework
- Review permit applications submitted for other projects within the region

In the pre-development phase permitting can be a time consuming and resource intensive process. It is important to identify all early permitting activities in the pre-development phase. This must be done while also anticipating failure of these permits and taking this failure into account with planning.

While no actual permits are usually procured during this phase it is important to coordinate with the relevant permitting authorities. This would be done to establish the cost and schedule impacts of each process, along with the information required to proceed. The amount of time taken in the permitting process will rely heavily on the preparation done in this phase and the resources put in by the project team.

The investments made by the project team in the pre-development phase are executed in the development phase. At this stage the project should have matured and passed through several iterations which bolster its credibility and definition. This will allow for a clearer explanation to permitting authorities and stakeholders. Projects must draw on the private development community which has expertise on the permitting process.

Key Considerations:

When trying to obtain permits for a project there are a few aspects which must be taken into consideration. These aspects will change based on the context of the project, this including location, timing, political climate etc.

- Conducting environment impact studies for the site
- Preparing local permit applications
- Stakeholder engagement and expert hearing support
- Creating management and monitoring plans

Support Mechanisms

Early-stage sustainable energy projects may engage with business incubators to gain support with permitting. Relevant incubators would host a wealth of information on

previous RE/EE projects. As such they can be used to gain insight into the permits needed for the particular project in question.

National Regulators can be contacted to gain insight into permits needed for projects. These regulators govern the scale of projects and as such must be engaged by the project team. These are one of the relevant authorities which was spoken about in the pre-development phase. National regulators can help to define the project and how it will proceed, especially, in terms of permit applications.

Organisation of Caribbean Utility Regulators (OOCUR) is a non-profit organisation which seeks to assist in improvement of utility regulation, foster transparent and stable utility regulation, undertake research and facilitate understanding of regulation issues. This organization is made of utility regulators throughout the Caribbean and can be contacted as a relevant authority. This would then further define the project scope and limitations in moving forward.

T- technology

Overview:

The technology is the means by which the energy will be captured and converted for use. The particularities of the site, nature of the resource as well as and the needs of the off taker, will determine the type of technology to be used. The engineering design will provide the relevant specifications that will aid in the selection of equipment, tools and materials required. Most renewable energy technologies have been modernized over the years and they have become more efficient which will increase the energy harnessing capabilities. Using more energy efficient technologies will help to reduce the total energy generation costs and increase the amount of electricity generated. This will make the system/project more efficient, reliable and resilient.

In the pre-development phase, the engineering design goes through several stages including but not limited to the conceptual design, research and specification, evaluation and design development. The design and selection of suitable technology will be based on the site and resource assessments. In this phase, financing options are considered. Also, based on the required technology, permits/licenses may be required for importation based on country laws and regulations.

In the development phase, the design process can be iterative, however, once approvals for funding and regulations have been met installation and implementation may begin.

Key Considerations:

Selecting the most suitable technology for a project is very important. There are several important factors that project developers should examine, they include:

Technical:

- Capacity and configuration- For example: wind power; larger turbines capture more energy.
- Storage- For example: battery bank- lithium ion versus lead acid, pumped storage, hydrogen, magnetic and flywheel etc.
- Standards for the product (technology), installation, maintenance and operation
- Site accessibility and transportation: Consider where the cables will be located- overhead or underground.
- Grid integration: Scope of project- considerations for existing infrastructure
- Efficiency/reliability refers to the technology that will help to maximize energy capture more efficiently and add resilience. For example: solar panels- best to choose the most efficient panel available (usually has a high percentage relative to the industry's average) on the market, consider temperature coefficient, durability and quality as well as the type of solar cells used in the panel. In other instances, panels with lower efficiency percentages may be used for structural reasons.)

Social:

- Job creation and community development

Economical:

- Cost for technology- based on the required capacity, the system will be sized; accordingly, a high-capacity system will require multiple units of the selected technology which will have a high cost.
- Cost considerations for importation and shipping fees, tariffs and duties that may apply.
- Resilience - Consider different suppliers based on location and potential environmental factors.

Environmental:

- Environmental impact on wildlife and ecosystems

Support Mechanisms:

CCREEE has several external partners who can provided expertise to help with the selection of renewable energy technologies based on the project type. External partners such as Wigton Wind Farm, UWI and OECS can provide great insight and information about the technology required for a specific renewable energy source. The CEKH is an internal provision which can be used to obtain research papers and other useful material that will be beneficial in the selection process. Additional modes of assistance include:

- Engaging partners for potential suppliers for the technology to be used: PPF
- Engaging educational institutions for case studies on various technologies and their respective features: CEKH, Thematic Hubs
- Assessing potential hazards to the various technologies: CEKH, IRRP, Thematic Hubs
- Creating simulations and energy analysis: IRRP

T- team

Overview:

It is essential that the right team is assembled for any RE/EE project. This team may consist of local, regional, and international stakeholders which not only have a vested interest in the project but have the available resources. There should be an assembly of a wide and diverse array of skills tailored to every need of the project which is being undertaken. Ensuring that all internal and external players are engaged at the right phase of the project.

Projects must engage decision makers, project & business management personnel and the professionals and staff associated with the project. Experts must be employed to address: legal & financing issues, technical & construction matters and power marketing campaigns. There must also be thought given to ensuring that the team is diverse and addresses the gender gap within the energy sector.

The development phase will consist of the most intensive and involved levels of teamwork as the project engages a full complement of professional services and stakeholder members. This done in order to work through the iterations of development and to also be prepared for execution.

Key Considerations:

When assembling a team for a project there are a few aspects which must be taken into consideration. These aspects will change based on the type and flavor of the project which is being undertaken. Thus:

- The team must be assembled to address all business, technical, financial, legal and operational aspects of the project
- The team must comprise of experienced individuals within the energy and Caribbean space

Support Mechanisms

The CEKH is one of CCREEE's flagship projects. It seeks to create a reliable and updated energy information source. One in which professionals may use as a community to exchange information and partner on projects. This falls right into the lap of the team aspect of the SROPTTC-C framework. The CEKH's community of practice allows professionals to come together easily, exchange information, and form diverse expert teams. The CEKH also features a learning management system in which teams can build capacity. This will facilitate a more robust team for the project, more able to tackle obstacles which come up during the development process.

Outside of the CCREEE sustainable energy business incubators are available to provide capacity building support to project teams. These incubators may also be able to connect professionals with projects and assemble a diverse team. This team will be able to fit the projects needs through the extended network and experience of the incubators.

C- capital

Overview

Financing is important for both project developers and project financers. It is required throughout all stages of the project development cycle, and as such project developers will need access to enough capital to be able to successfully develop the project.

If value provided to both financers and end-use-stakeholders are greater than the risk of investing capital then investors will provide financial support for the completion of the project.

There are various ways to finance SE projects. These include, but are not limited to, development equity, project equity, project debt, grants, and rebates. The amount of each used in financing a project determines the project's financing structure. Debt capital are funds which are borrowed. These funds are repaid according to agreed terms which specify conditions such as repayment period and interest owed. Issuers require guarantors and collateral in case the borrower defaults on payment. A common example of debt capital is using loans to finance a project. Project developers can see several advantages in considering debt capital for their project:

- They can have immediate access to the funds once a loan agreement has been reached,
- The lender has no control over the project and cannot influence decisions made for the project, and
- The consistency of loan repayments makes planning easier by replacing potential variabilities with a constant expense amount.

Equity capital are funds provided to a venture by investors. Investors put money into the venture and in so doing gain part ownership of the venture. This means, unlike project financers who lend and have no decision-making rights, investors who buy a fraction of the project have voting right equal to their ownership share. Equity is often used to get a venture up and running and once the venture begins making profit, the shareholders begin to earn dividends. Advantages to equity financing include the fact that if a bank refuses to lend to the venture because of policy or because of the scale of the project, investors can be more lenient. Additionally, equity can be selected when it's less expensive to sell parts of a company rather than pay interest accrued because of a loan.

Grants are funds given with no obligation of repayment or ownership. The money provided by a grant is often restricted for specific use as stipulated by the donor.

Considerations:

Before project funders are approached and a financial close is established the developer needs to refine the project's financial model. This refinement occurs during the development phase where the developer carries out activities such as hiring advisors, acquiring land and water rights and working on project structuring by handling PPA negotiations, interconnection agreements and identifying potential lenders.

Alongside knowing the potential funders that will be approached, it is important to consider the total cost of the venture to ensure little to no gaps in funding arise over the course of final project development. The capital acquired would need to be used to develop even more value for the funders and developers, and as such a clear idea of how and how much value can be retrieved from the project is crucial. Value may be obtained through the PPAs and EPAs the developer would have negotiated before approaching funders – this ties in with the off-taking aspect of the SCROPTTC-C tool.

Additionally, it is important to identify, evaluate and monitor different risks to the project – this can be done with the help of investors (lenders), country decision makers (borrowers), and analysts (market entry strategists).

Support Mechanisms

Support for procuring project capital can be obtained once project developers have applied for assistance with the CCREEE PPF. The facility works with project developers, project investors, project financers and financial institutions to assist in various stages of project development. For instance, two services offered related to capital are project financial modelling and financier introduction.

External assistance can be obtained from regional financial institutions such as the Caribbean Development Fund (CDF). The CDF has a facility that provides guarantees for loans for renewable energy and energy efficiency projects. This, the Credit Risk Abatement Facility (CRAF), helps improve the likelihood of projects being approved for support as it reduces the risk to financers and investors. It helps encourage lending into SE initiatives within CARICOM in the hopes of transforming the energy space through development. Additional support can be garnered from NFIs and through Investment Forums.

C- construction

Overview:

Construction is the last component of SROPTTC-C. It is the implementation phase of the project where systems are built and operationalized. The requirements and complexities of the construction phase must be taken into consideration to ensure optimal operation and longevity.

Key Considerations:

There are a number of issues that need to be considered for SE projects such as:

- Technical
  - Building codes and standards
  - Procurement of building materials/ technology components
  - Development of a maintenance plan
- Sustainability
  - Context specific best practices
  - Climate resilience
- Legal and Financial
  - Proposed timeline
  - Legal agreements/ contracts
  - Insurance

Project developers should cover all their bases to minimize delays and project shortcomings.

Support Mechanisms:

The CCREEE PPF provides support in the construction phase of sustainable energy projects in areas such as procurement and quality assurance. Additionally, CCREEE's Sustainable Buildings Programme provides support in the area of buildings' energy performance. The Sustainable Buildings Programme in partnership with the CARICOM Organisation for Standards and Quality (CROSQ) developed the CARICOM Regional Energy Efficiency Building Code (CREEBC), outlines the requirements for achieving energy efficiency buildings in the Caribbean region. Both CCREEE's Sustainable Buildings Programme and CROSQ are poised to extend their expertise to aid in this area of projects' development.

Conclusion

Traditional approaches to electricity generation and usage are slowly being phased out in the Caribbean. The region has abundant amounts of varying RER that can be used to provide electricity at lower costs to consumers when compared to the costs of electricity generated by traditional means. Additionally, to reduce energy intensity, Caribbean Member States aim to implement more energy efficient solutions. With such ripe conditions for SE project uptake, it is unfortunate that the

SE transition in the region isn't happening at a faster rate. Barriers to rapid SE development include lack of expertise to properly develop projects and scarce financial resources. As the implementation hub for SE in the region, the CCREEE is providing this SROPTTC-C framework to help guide project developers in identifying, assessing, and addressing potential fatal flaws that can prevent project development. The SROPTTC-C, primarily through the CCREEE PPF, is aimed at helping project developers create successful projects, thus increasing the number of SE projects in the region.

For further information please visit the CCREEE PPF webpage or send an e-mail to info@ccreee.org.

Appendix

CCREEE Thematic Hubs

Bioenergy- Caribbean Community Climate Change Centre (CCCCC)
Hydro- Guyana Energy Agency
Solar PV- University of the West Indies (UWI) Mona Campus
Solar Thermal- UWI Cave Hill Campus
E-Mobility- UWI St. Augustine Campus
Wind- Wigton Windfarm Ltd.
Geothermal- Organisation of Eastern Caribbean States (OECS)
Quality Infrastructure- CARICOM Organisation for Standards and Quality (CROSQ)

CCCREEE National Focal Institutions (NFIs)

Country	Contact Name	Contact Role
Antigua and Barbuda	Mr. Edson Joseph	Permanent Secretary
Bahamas	Mr. David Cates	Permanent Secretary
Barbados	Mrs. Francine Blackman	Permanent Secretary (Ag.)
Belize	Mr Ryan Cobb	Energy Director
Dominica	Mr. Michael Fadelle	RE Programme Coordinator
Grenada	Ms. Kim Frederick	Permanent Secretary
Guyana	Dr. Mahender Sharma	Chief Executive Officer for Guyana Energy Agency
Haiti	Mr. Nicolas Allien	Senior Energy Specialist
Jamaica	Mrs. Carol Palmer	Permanent Secretary
Monserrat	Mrs. Beverly Mendes	Permanent Secretary
St. Kitts	Mr. Bertill Browne	Director
St. Lucia	Mr. Ivor Daniel	Permanent Secretary
St. Vincent and the Grenadines	Mr. Ellsworth Dacon	Director
Suriname	Mr. Dave Abeleven	Permanent Secretary
Trinidad and Tobago	Mrs. Penelope Bradshaw-Niles	Permanent Secretary (Ag)

Member State Utilities, Regulators, and Incubators

Member State	Utilities	Regulators	Incubators
Antigua and Barbuda	Antigua Public Utilities Authority		Accelerate Antigua Antigua and Barbuda Science Innovation Park
Bahamas	Bahamas Power and Light Grand Bahama Power Company	Utility Regulation and Competition Authority	Access Accelerator
Barbados	Barbados Light and Power	Fair Trading Commission	Bloom Cleantech Cluster Barbados
Belize	Belize Electricity Limited (BEL)	Public Utilities Commission	
Dominica	Dominica Electricity Services Limited	Independent Regulatory Commission	Start Up 767
Grenada	Grenada Electricity Services Limited	Public Utilities Regulatory Commission	Start Up Grenada
Guyana	Lethem Power Company Mahdia Power Company Kwakwani Utilities Incorporated Port Kaituma Power Company		Belvedere Business Incubator Centre
Haiti	Electricity of Haiti (EDH)	Office of Utilities Regulation	
Jamaica	Jamaica Public Service Company (JPSCo)	Office of Utilities Regulation Government Electrical Inspectorate	
Monserrat	Montserrat Utilities Limited		
St. Kitts	St. Kitts Electricity Company Ltd.		

St. Lucia	Saint Lucia Electricity Services Limited	National Utilities Regulatory Commission	
St. Vincent and the Grenadines	St. Vincent Electricity Services Ltd.		
Suriname	N.V. Energiebedrijven Suriname	Suriname Energy Authority (Energie Autoriteit Suriname - EAS)	Ondernemershuis Paramaribo
Trinidad and Tobago	Regulated Industries Commission	Trinidad and Tobago Electricity Commission Powergen	