Regulatory Guidelines on the Procurement of Utility-Scale Renewable Energy Power Generation Facilities

Support for a Renewable Energy Transition in OECS Countries
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Contents

Acronyms and Abbreviations

APUA	Antigua Public Utilities
DG	Distributed generation
DOMLEC	Dominica Electricity Services Limited
FIT	Feed-In Tariff
GGGI	Global Green Growth Institute
GHG	Greenhouse gas
IPP	Independent Power Producer
IRRP	Integrated Resource and Resiliency Plan
kW	kilowatt
kWh	kilowatt-hour
LCOE	Levelised cost of electricity
LUCELEC	St. Lucia Electricity Services Limited
MW	megawatt
MWh	megawatt-hour
NDC	Nationally Determined Contributions
NETS	National Energy Transition Strategy
NREL	National Renewable Energy Laboratory
OECS	Organisation of Eastern Caribbean States
PPA	Power Purchase Agreement
PV	Photovoltaic
RFP	Request for Proposal
SEF	Sustainable Energy Framework
UNFCCC	United Nations Framework Convention on Climate Change
VINLEC	St. Vincent Electricity Services Limited

Executive Summary

The electricity sector across OECS member states can be characterized by high retail rates, a heavy reliance on imported fossil fuels, and vulnerability to natural disasters and other threats. Being cognizant of these issues, OECS member states have published energy policies and set NDC targets which include goals for increased utilization of renewable energy in electricity generation. The main reasons for this include diversification of energy resources, enhancing resilience in the electricity sector to natural disasters and other threats, greater use of indigenous resources in electricity generation, reduction of GHG emissions, access to electricity, electricity affordability, among other things.

In attempting to meet renewable energy targets, which in several instances are very aggressive, OECS country governments may choose to pursue different strategies to meeting these targets, including distributed generation facilities and centralized utility scale renewable energy generation facilities. Recognizing that many OECS member states do not have frameworks in place to facilitate increased integration of renewable energy in their electricity networks, GGGI, in support of the OECS's implementation of the Sustainable Energy Framework and the Eastern Caribbean Solar Challenge, has developed two regulatory guidelines to provide guidance to regional electricity sector decision makers in developing or improving their own frameworks for integration of renewable energy in their electricity networks. The first set of guidelines are presented in document titled "Regulatory Guidelines on the Interconnection of Customer-Owned Renewable Energy Facilities to the Grid" dated December, 2022 and is aimed at informing electricity sector stakeholders on major considerations and best practices when developing regulatory frameworks for interconnection to the grid of customer-owned renewable energy facilities.

This document represents the second set of guidelines and is aimed at informing electricity sector stakeholders on major considerations and key elements of different strategies to procurement of utility-scale renewable energy power generation facilities. It provides information on overall considerations that need to be taken into account when developing processes and procedures for procurement of utility-scale renewable energy generation facilities and explores competitive and non-competitive procurement strategies. With respect to competitive strategies, open competitive solicitations and renewable energy auctions are explored, while with respect to non-competitive strategies, bilateral negotiations and feed-in tariff schemes for the addition of utility-scale renewable energy generation capacity are explored. In each instance information is provided on the features of each strategy and the considerations that should be taken into account when developing processes and procedures to facilitate them.

Guidelines provided in this document are of a general nature and are only intended to provide guidance in developing country-specific policies and procedures, in consideration of the legal and regulatory framework existing in each country. GGGI understands that some countries may require targeted assistance in developing their own specific policies and procedures for addition of renewable energy power generation capacity, and as part of its project titled "Support for a Renewable Energy Transition in OECS Countries", has already embarked on providing such assistance. It is expected that GGGI's interventions will assist territories in achieving their renewable energy targets.

1. Introduction

1.1 Purpose

As part of its project titled "Support for a Renewable Energy Transition in OECS Countries", the Global Green Growth Institute (GGGI) committed to supporting the Sustainable Energy Framework (SEF) developed by the Organisation of Eastern Caribbean States (OECS) Commission, as well as the goals of the Eastern Caribbean Solar Challenge. As part of this support, GGGI conducted a series of consultation meetings with energy sector stakeholders from OECS Member States discussing GGGI's planned support of the SEF and soliciting information regarding development of regulatory frameworks to facilitate increased utilization of renewable energy (RE) in power generation.

Following the consultation meetings referenced above, GGGI developed a Framework and Workplan describing the series of activities GGGI intends to undertake in support of the SEF. These include, inter-alia, the development of regulatory guidelines to aid electricity sector decision makers in the Eastern Caribbean in developing their own frameworks for integration of renewable energy into electricity networks across the region. The first of these guidelines is titled "Regulatory Guidelines on the Interconnection of Customer-Owned Renewable Energy Facilities to the Grid" dated December, 2022 and is aimed at informing electricity sector stakeholders on major considerations and best practices when developing regulatory frameworks for interconnection to the grid of customer-owned renewable energy facilities. This document represents the second set of guidelines and is aimed at informing electricity sector stakeholders on major considerations and key elements of different strategies to procurement of utility-scale renewable energy power generation facilities.

1.2 Background

As indicated above, GGGI developed a Framework and Workplan describing activities it intends to undertake in support of the OECS's SEF. These activities, intended for completion during the first phase of the project, which is intended to conclude in February 2023, includes the development of regulatory guidelines on the topics indicated in Table 1 below, with Topic B being the subject of this document.

Table 1: Description of Regulatory Guidelines to be Developed by GGGI

DESCRIPTION OF REGULATORY GUIDELINES TO BE DEVELOPED BY GGGI	
Topic #	**Description**
A.	Interconnection of customer-owned renewable energy facilities to the grid.
B.	Procurement of utility-scale renewable energy facilities.

Based on information gathered by GGGI, as presented in the referenced Framework and Workplan (also presented in GGGI's report titled "Electricity Sector Overview – OECS Member States"), OECS territories are heavily dependent on fossil fuels for generation of electricity, with most territories having close to 90% or greater of their installed generation capacity being fossil fuel based. One notable exception is Dominica, with approximately 25% of the installed capacity attributable to hydroelectric facilities. Other renewable energy technologies found to be currently utilized in the OECS region for electricity generation include solar PV systems and wind turbine generators. Nevertheless, it is clear that OECS territories are generally heavily reliant on fossil fuels for electricity generation. However, at the same time, a number of territories have set aggressive renewable energy targets, of as much as 100% renewable energy in electricity generation by 2030, according to their respective energy policies or Nationally Determined Contributions. Attempting to achieve these targets will require overcoming several challenges including deficiencies in the necessary legal and regulatory frameworks needed to facilitate interconnection of utility scale and distributed renewable energy facilities.

It should be noted that while information on electricity sector statistics and governance frameworks was gathered for most of the OECS territories, no information was gathered for Martinique, Guadeloupe and the British Virgin Islands.

1.3 Objectives of Guidelines

As indicated above, utilization of renewable energy across OECS territories is generally at low levels, with single digit percentage of renewable energy power generation capacity installed in most instances. Additionally, as detailed in Section 2 of this document, most of the existing utility-scale renewable energy power generation facilities were developed by the incumbent utility or the government with little private participation at the utility-scale level. This is in part due to legacy electricity sector legislation, centered around a vertically integrated utility structure with the utility having control of all aspects of generation, transmission and distribution of electricity.

In addition to updating electricity legislation to allow for broader participation in electricity generation, achieving the ambitious RE targets set by OECS Member States requires the appropriate regulatory mechanisms, policies and procedures to be in place so that potential investors can clearly identify the requirements for participating in the sector, including the modalities by which proposals for development of renewable energy power generation facilities can be submitted to the process owner, the criteria to be used to assess proposals, and the contract award and negotiation process.

In that regard, GGGI has developed a set of guidelines to provide regulators and other energy sector decision makers across the OECS region with information that should prove useful in developing policies and procedures for addition of renewable energy power generation capacity to the grid.

1.4 Scope and Structure of Document

This document was compiled to provide guidelines to help OECS energy sector stakeholders in developing policies and addition of renewable energy power generation capacity to the grid.

This document is divided into five (5) sections, including this introduction and contains Appendices.

- Section 2: Use of Renewable Energy in Power Generation in OECS Territories
- Section 3: Considerations and Guidelines in Developing Policies and Procedures for Addition of Renewable Energy Capacity
- Section 4: Priority Considerations in Developing Policies and Procedures
- Section 5: Conclusions

2. Use of Renewable Energy in Power Generation in OECS Territories

As stated in Section 1, utilization of renewable energy across the OECS territories is generally at low levels. However, as also stated in Section 1, a number of OECS territories have set aggressive renewable energy targets. To further demonstrate this, information on installed utility-scale generation facilities, along with information on renewable energy targets is provided on the following territories:

1. Anguilla
2. Antigua and Barbuda
3. Commonwealth of Dominica
4. Grenada
5. Montserrat
6. Nevis
7. Saint Kitts (Saint Christopher)
8. Saint Lucia
9. Saint Vincent and the Grenadines

Please note that information found on each of the OECS territories was not entirely consistent across territories, especially with regards to recency of information available. Nevertheless, the latest information found by GGGI is presented below. It should also be noted that no information is provided on the British Virgin Islands, Guadeloupe and Martinique.

2.1 Anguilla: Installed Capacity, Peak Demand and Renewable Energy Targets

2.1.1 Installed Capacity and Peak Demand

Information on installed generating capacity and peak electricity demand in Anguilla, as at the end of 2018, is presented in Table 2 below.

Table 2: Anguilla Electricity Sector – Installed Capacity and Peak Demand (2018)

ANGUILLA ELECTRICITY SECTOR – INSTALLED CAPACITY AND PEAK DEMAND (2018)		
	Technology	Installed Capacity (MW)
Conventional Generation Capacity	Diesel	26.0
Interconnected Renewable Energy Generation Capacity	None Presently	0.0
Total Installed Generation Capacity		**26.0**
Peak Demand		**13.7**

As indicated in Table 2, at the end of 2018, utility scale power generation was reported as being solely provided by diesel fuel generation units. Previously, a small percentage of power generation in Anguilla was provided by grid connected solar PV facilities, but these were reportedly destroyed by Hurricane Irma in 2017.

2.1.2 Renewable Energy Targets

The latest reference document that provides overall policy direction for Anguilla's electricity sector is the Anguilla National Energy Policy: 2010 - 2020 dated December 2009. This document does not indicate a target for the incorporation of renewable energy in the electricity generation mix, however, US Department of Energy data indicates a target of 30% by 2030. This target was confirmed during consultations with energy sector stakeholders in Anguilla.

2.2 Antigua and Barbuda: Installed Capacity, Peak Demand and Renewable Energy Targets

2.2.1 Installed Capacity and Peak Demand

Information on installed generating capacity as at the end of 2020, and the reported peak demand for 2015, for Antigua and Barbuda is presented in Table 3 below.

Table 3: Antigua Barbuda Electricity Sector – Installed Capacity & Peak Demand (2020)

ANTIGUA AND BARBUDA ELECTRICITY SECTOR – INSTALLED CAPACITY & PEAK DEMAND		
	Technology	Installed Capacity (MW)
Conventional Generation Capacity	Diesel	78.25
Interconnected Renewable Energy Generation Capacity	Solar PV	7.00
Total Installed Generation Capacity (Utility-Scale)		**85.25**
Peak Demand		**50***

** - Represents peak demand reported for 2015*

As indicated in Table 3, at the end of 2020, total interconnected utility-scale generation capacity in Antigua and Barbuda stood at 85.25MW which satisfied a peak demand expected to be close to the peak demand reported for 2015 – 50MW. Utility-scale renewable energy facilities, all utilizing solar PV technology, comprise approximately 8.2% of installed generating capacity. The 7MW of total installed solar PV generation capacity includes the following facilities:

- 3MW facility at the V.C. Bird International Airport
- 4MW facility at Bethesda

Both solar PV facilities are owned by the utility – Antigua Public Utilities Authority (APUA).

2.2.2 Renewable Energy Targets

The latest reference document that provides overall policy direction for Antigua and Barbuda's electricity sector is the Antigua and Barbuda National Energy Policy dated August 2011, which indicates a target of achieving 15% renewable energy in the electricity supply mix by 2030. A more recent policy document, however, which includes a reference to renewable energy targets in Antigua and Barbuda, is the Antigua and Barbuda Updated Nationally Determined Contribution dated September 2021. This document indicates a more ambitious target of achieving 86% renewable energy generation, from local resources, in the electricity sector by 2030.

2.3 Commonwealth of Dominica: Installed Capacity, Peak Demand and Renewable Energy Targets

2.3.1 Installed Capacity and Peak Demand

Information on installed generating capacity and peak electricity demand in Dominica, as at the end of 2021, is presented in Table 4 below.

Table 4: Dominica Electricity Sector – Installed Capacity & Peak Demand (2021)

DOMINICA ELECTRICITY SECTOR – INSTALLED CAPACITY & PEAK DEMAND		
	Technology	Installed Capacity (MW)
Conventional Generation Capacity	Diesel	20.1
Interconnected Renewable Energy Generation Capacity	Run of River Hydro	6.64
Total Installed Generation Capacity (Utility-Scale)		**26.74**
Peak Demand		**16.39**

As indicated in Table 4, at the end of 2021, total interconnected utility-scale generation capacity in Dominica stood at 26.74MW which satisfied a peak demand of 16.39MW. Utility-scale renewable energy facilities, all reported as being run of river hydroelectric facilities, comprise approximately 25% of installed generating capacity. The total of 6.64MW of installed hydroelectric capacity is split among three facilities at Trafalgar, Padu and Laudat, all owned by the incumbent electricity utility, Dominica Electricity Services Ltd. (DOMLEC).

2.3.2 Renewable Energy Targets

The latest reference document that provides overall policy direction for Dominica's electricity sector is Dominica's National Energy Policy dated December 2020, which indicates a target of achieving 100% renewable energy in electricity generation by 2030. This target is confirmed in the Commonwealth of Dominica's Updated Nationally Determined Contribution, dated July 2022.

2.4 Grenada: Installed Capacity, Peak Demand and Renewable Energy Targets

2.4.1 Installed Capacity and Peak Demand

Information on installed generating capacity and peak electricity demand in Grenada, as at the end of 2020, is presented in Table 5 below.

Table 5: Grenada Electricity Sector – Installed Capacity & Peak Demand (2020)

GRENADA ELECTRICITY SECTOR – INSTALLED CAPACITY & PEAK DEMAND (2020)	
Generation Type	Installed Capacity (MW)
Conventional	54.48
Utility Owned Renewable Energy	1.1
Total Installed Utility Scale Generation Capacity	**55.58**
2020 Peak Demand	**31.86**

As indicated in Table 5, as at the end of 2020, total interconnected utility-scale generation capacity in Grenada stood at 55.58MW which satisfied a peak demand of 31.86MW. Utility-scale renewable energy facilities, utilizing solar PV technology, comprise approximately 2% of installed utility-scale generating capacity.

2.4.2 Renewable Energy Targets

The latest reference document that provides overall policy direction for Grenada's electricity sector is the Grenada National Energy Policy dated November 2011, which indicates a target of achieving 20% renewable energy in electricity generation by 2020.

2.5 Montserrat: Installed Capacity, Peak Demand and Renewable Energy Targets

2.5.1 Installed Capacity and Peak Demand

Information on installed generating capacity and peak electricity demand in Montserrat, as at the end of 2020, is presented in Table 6 below.

Table 6: Montserrat Electricity Sector – Installed Capacity, Energy Storage & Peak Demand (2020)

MONTSERRAT ELECTRICITY SECTOR – INSTALLED CAPACITY, ENERGY STORAGE & PEAK DEMAND		
	Technology	Installed Capacity (MW)
Conventional Generation Capacity	Diesel	7.215
Interconnected Renewable Energy Generation Capacity	Solar PV	1.000
Total Installed Generation Capacity		**8.215**
Energy Storage	Battery Energy Storage	**2.500 (1.088MWh)**
Peak Demand		**2.300**

As indicated in Table 6, as at the end of 2020, total interconnected utility-scale generation capacity in Montserrat stood at 8.22MW which satisfied a peak demand of 2.3MW. Utility-scale renewable energy facilities, utilizing solar PV technology, comprise approximately 12.2% of installed utility-scale generating capacity.

2.5.2 Renewable Energy Targets

The latest reference document that provides overall policy direction for Montserrat's electricity sector is the Montserrat National Energy Policy dated January 2016. This policy applies to the period 2016 – 2020 and while it does not definitively state renewable energy targets, there is an indication by the government minister with responsibility for the energy sector that Montserrat achieves 100% renewable energy electricity generation by 2020. However, it was indicated in consultations with Montserrat energy sector representatives, that the timeline for achieving 100% renewable energy in electricity generation has been revised by Cabinet to 2030.

2.6 Nevis: Installed Capacity, Peak Demand and Renewable Energy Targets

2.6.1 Installed Capacity and Peak Demand

Information on installed generating capacity and peak electricity demand in Nevis, as at the end of 2019, is presented in Table 7 below.

Table 7:Nevis Electricity Sector – Installed Capacity & Peak Demand (2019)

NEVIS ELECTRICITY SECTOR – INSTALLED CAPACITY & PEAK DEMAND		
	Technology	**Installed Capacity (MW)**
Conventional Generation Capacity	Diesel	18.4
Interconnected Renewable Energy Generation Capacity	Wind	2.2
Total Installed Generation Capacity		**20.6**
Peak Demand		**9.5**

As indicated in Table 7, as at the end of 2019, total interconnected utility-scale generation capacity in Nevis reportedly stood at 20.6MW which satisfied a peak demand of 9.5MW. Interconnected renewable energy power generation capacity was reported to comprise approximately 10.7% of total installed generation capacity. This 2.2MW renewable energy generation capacity is accounted for by a wind turbine power generation facility at Maddens windfarm owned by an independent power producer (IPP) - Windwatt Nevis Ltd. This facility was commissioned in 2010.

2.6.2 Renewable Energy Targets

The latest reference document that provides overall policy direction for Nevis' electricity sector is the Saint Kitts and Nevis National Energy Policy dated April 2011. However, no renewable energy targets are specified. Nevertheless, the St. Kitts and Nevis Updated Nationally Determined Contributions dated October 2021 indicate a target of 100% renewable energy power generation by 2030.

2.7 Saint Kitts (Saint Cristopher) Electricity Sector: Installed Capacity, Peak Demand and Renewable Energy Targets

2.7.1 Installed Capacity and Peak Demand

Information on installed generating capacity and peak electricity demand in Saint Kitts, as at the end of 2019, is presented in Table 8 below.

Table 8: Saint Kitts Electricity Sector – Installed Capacity & Peak Demand (2019)

SAINT KITTS ELECTRICITY SECTOR – INSTALLED CAPACITY & PEAK DEMAND (2019)		
	Technology	Installed Capacity (MW)
Conventional Generation Capacity	Diesel	45.4
Interconnected Renewable Energy Generation Capacity	Solar	1.5
Total Installed Generation Capacity		**46.9**
Peak Demand		**26.0**

As indicated in Table 8, as at the end of 2019, total interconnected utility-scale generation capacity in Saint Kitts reportedly stood at 46.9MW which satisfied a peak demand of 26.0MW. Utility-scale renewable energy facilities, utilizing solar PV technology, comprise approximately 3.2% of installed utility-scale generating capacity.

2.7.2 Renewable Energy Targets

The latest reference document that provides overall policy direction for the electricity sector in Saint Kitts is the Saint Kitts and Nevis National Energy Policy dated April 2011. However, no renewable energy targets are specified. Nevertheless, the St. Kitts and Nevis Updated Nationally Determined Contributions dated October 2021 indicate a target of 100% renewable energy power generation by 2030.

2.8 Saint Lucia: Installed Capacity, Peak Demand and Renewable Energy Targets

2.8.1 Installed Capacity and Peak Demand

Information on installed generating capacity and peak electricity demand in Saint Lucia, as at the end of 2021, is presented in Table 9 below.

Table 9: Saint Lucia Electricity Sector – Installed Capacity & Peak Demand (2021)

SAINT LUCIA ELECTRICITY SECTOR – INSTALLED CAPACITY & PEAK DEMAND		
	Technology	Installed Capacity (MW)
Conventional Generation Capacity	Diesel	88.4
Interconnected Renewable Energy Generation Capacity	Solar	3.0
Total Installed Generation Capacity		**91.4**
Peak Demand		**60.9**

As indicated in Table 9, as at the end of 2021, total interconnected utility-scale generation capacity in Saint Lucia reportedly stood at 91.4MW which satisfied a peak demand of 60.9MW. Utility-scale renewable energy facilities, utilizing solar PV technology, comprise approximately 3.3% of installed utility-scale generating capacity. The 3.0MW renewable energy generation capacity is accounted for by a single solar PV facility owned by the utility, St. Lucia Electricity Services Limited (LUCELEC), located at La Tourney, Vieux Fort.

2.8.2 Renewable Energy Targets

The reference document that provides overall policy direction for the electricity sector in Saint Lucia is the Saint Lucia National Energy Policy dated January 2010. It indicates the following targets for incorporation of indigenous renewable electricity generation into the electricity generation:

- 2013 – 5%
- 2015 – 15%
- 2020 – 30%

However, subsequent to the Saint Lucia National Energy Policy of 2010, the Government of Saint Lucia and LUCELEC initiated the development of the Saint Lucia National Energy Transition Strategy (NETS), and subsequently adopted its recommendations. The NETS indicates that the Government of Saint Lucia, in 2014, updated the target for renewable energy penetration, increasing the target for 2020 from 30% to 35%.

It should be noted that the Government of Saint Lucia is in the process of revising the energy policy for the island, which is expected to include revised targets, however, this has not yet been finalized.

2.9 Saint Vincent and the Grenadines: Installed Capacity, Peak Demand and Renewable Energy Targets

2.9.1 Installed Capacity and Peak Demand

Information on installed generating capacity and peak electricity demand in Saint Vincent and the Grenadines, as at the end of 2018, is presented in Table 10 below.

Table 10: Saint Vincent and the Grenadines Electricity Sector –Installed Capacity and Peak Demand (2018)

SAINT VINCENT AND THE GRENADINES ELECTRICITY SECTOR –INSTALLED CAPACITY AND PEAK DEMAND (2018)						
Technology	Installed Capacity per Island (MW)					
	St. Vincent	Bequia	Union Island	Canouan	Mayreau	Total
Diesel	37.06	4.15	1.24	4.04	0.14	**46.63**
Hydro	5.71	-	-	-	-	**5.71**
Solar	0.59	-	0.6	-	0.23	**1.42**
Total Installed Capacity	**43.36**	**4.15**	**1.84**	**4.04**	**0.37**	**53.76**
Historic Peak Demand	**21.69**	**1.66**	**0.59**	**0.81**	**0.09**	

As indicated in Table 10, as at the end of 2018, total interconnected utility-scale generation capacity in Saint Vincent and the Grenadines stood at 53.76MW split across five islands as indicated, with St. Vincent having the largest installed capacity of 43.36MW which satisfied a peak demand of 21.69MW for the year. Utility-scale renewable energy facilities, utilizing hydroelectric and solar PV technology, comprise approximately 13.3% of installed utility-scale generating capacity.

2.9.2 Renewable Energy Targets

The latest reference document that provides overall policy direction for the electricity sector in Saint Vincent and the Grenadines is the Saint Vincent and the Grenadines National Energy Policy dated March 2009. No renewable energy targets are specified in this energy policy, however, the Saint Vincent and the Grenadines' Energy Action Plan dated January 2010, indicates the following targets for incorporation of indigenous renewable electricity generation into the electricity generation:

- 2015 – 30%
- 2020 – 60%

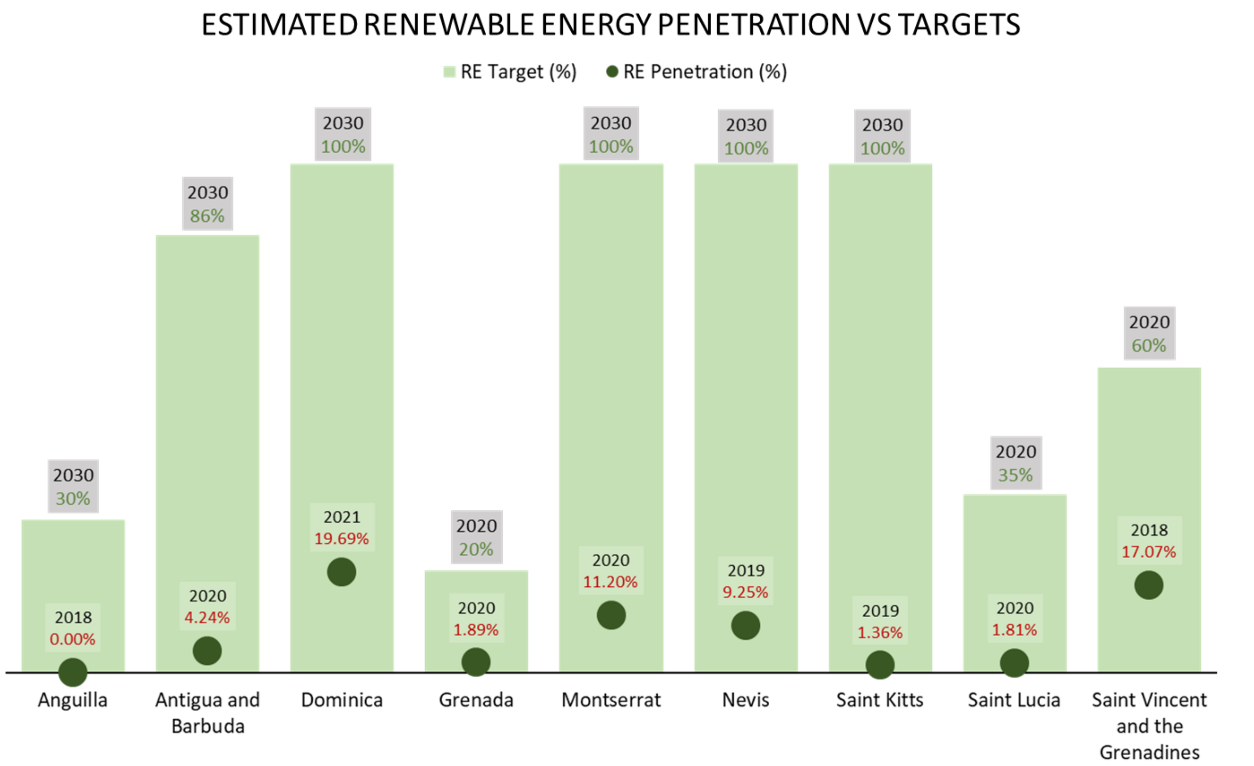
2.10 Summary of Renewable Energy Targets and Estimated Renewable Energy Penetration

As indicated in Sections 2.1 to 2.9, the OECS territories referenced, have all set renewable energy targets which vary from 20% by 2020 to 100% by 2030, with limited but varying degrees of progress towards meeting them. To better illustrate the progress toward meeting targets set in individual territories, renewable energy penetration, measured as a percentage of net generation, was estimated based on available information and compared to the relevant targets. This is presented in Table 11 and Figure 1 below.

Table 11: Summary of Renewable Energy Targets and Estimated Renewable Energy Penetration

SUMMARY OF RENEWABLE ENERGY TARGETS AND ESTIMATED RENEWABLE ENERGY PENETRATION				
Territory	RE Target		RE Penetration	
	%	Year	% Gross Generation	Year
Anguilla	30%	2030	0.00%	2018
Antigua and Barbuda	86%	2030	4.24%	2020
Dominica	100%	2030	19.69%	2021
Grenada	20%	2020	1.89%	2020
Montserrat	100%	2030	11.20%	2020
Nevis	100%	2030	9.25%	2019
Saint Kitts	100%	2030	1.36%	2019
Saint Lucia	35%	2020	1.81%	2020
Saint Vincent and the Grenadines	60%	2020	17.07%	2018

Figure 1: Estimated Renewable Energy Penetration vs. Targets



It should be noted that, with respect to Table 11 and Figure 1 above, information on providing gross generation (kWh) from renewable energy sources was available in some instances, however in other instances, this information was not available to GGGI, and was thus estimated based on installed renewable energy capacity and representative capacity factors by technology. It was also assumed that RE facilities are fully operational, i.e., not out-of-service, except for planned maintenance. Additionally, GGGI is aware that, in some instances, territories may be in the process of revising targets, however the targets referenced are based on publicly available information or communicated through consultations with energy sector representatives in the respective territories.

3. Considerations and Guidelines in Developing Policies and Procedures for Addition of Renewable Energy Capacity

As indicated in Sections 1 and 2 above, renewable energy penetration is generally at low levels across OECS territories, with Figure 1 in Section 2 showing estimated renewable energy penetration below 10% for six (6) of the nine (9) territories shown. While the other three (3) territories have estimated renewable energy penetration of as high as 19.7% (in the case of Dominica), all territories are well below their targets for use of renewable energy in electricity generation, in the near to medium term, as indicated in Figure 1.

With significant gaps between renewable energy penetration rates and targets, some OECS territories have been in the process of reforming their electricity sector through updating applicable legislation and policies to introduce independent regulatory entities, introduce competition in the electricity sector, and address barriers to allow increased use of renewable energy technologies and energy efficiency measures. Such reforms may enable electricity sector decision makers in the respective OECS territories to pursue, or allow for, different strategies to increasing the use of renewable energy in power generation, either through distributed generation facilities or through utility-scale facilities. This document, specifically Sections 3.1 to 3.6 below, addresses procurement of utility-scale renewable energy power generation facilities, providing a number of considerations and guidelines which electricity sector stakeholders in OECS territories may take into account when developing their own specific policies and procedures for addition of renewable energy power generation capacity. As indicated in Section 1, GGGI has addressed the development of frameworks for interconnection of renewable energy distributed generation facilities by developing the document titled "Regulatory Guidelines on the Interconnection of Customer-Owned Renewable Energy Facilities to the Grid" dated December, 2022.

3.1 Implications of Legal and Regulatory Framework

The legal and regulatory framework applicable to the electricity sector in the respective OECS territories, establishes the context within which the addition of generation capacity can take place, at the minimum cost for electricity rate payers, consistent with long-term development plans and goals as it may pertain to GHG emissions reductions or energy security and affordability, etc. It should also explicitly state the roles of the relevant electricity sector stakeholders, whether this be the energy ministry, the utility, and independent electric utility regulator, or some other entity, requiring them to act in a manner to ensure adequacy of generation capacity, and that development objectives for the sector are met.

The traditional operational model for electric utilities has been that of a vertically integrated utility structure, where a monopoly utility controls all aspects of delivering electricity to end users, i.e., generation, transmission, and supply. Many jurisdictions worldwide have departed from this structure by allowing for competition, particularly as it pertains to generation and supply of electricity.

While the traditional vertically integrated utility structure is still widespread throughout the Caribbean, with many countries having government-owned monopoly electric utilities, some countries, including OECS Member States, have been taking steps to allow for private participation at the generation level. Such participation has mostly been facilitated at the distributed generation level; however, efforts have been ongoing to make allowances for independent private participation in utility-scale renewable energy power generation.

Reforms in the functions of the electricity sector is dependent on the enabling legal and regulatory framework in place and amendments/revisions to electricity sector policy and legislation may be necessary if such reforms are desired. In that regard, before regulatory policies and procedures for addition of renewable energy power generation capacity can be established, careful consideration has to be made regarding what is allowed for in existing legislation, and how this aligns with development plans and goals established in applicable policies. As stated previously, the roles of the major electricity sector stakeholders, and identification of the process owner in charge of procurement of utility-scale renewable energy generation has to be clearly established. If it is found that the enabling electricity sector legislation and/or regulations require amendments, electricity sector decision makers will need to carefully consider, propose and implement any amendments required.

3.2 Policy Direction and System Planning Process

As indicated in Section 3.1 above, a key consideration in developing policies and procedures for addition of renewable energy power generation capacity, or addition of power generation capacity in general, is that such policies and procedures must be aligned with development plans and goals established in government policy for the electricity sector, and energy sector as a whole. Features of applicable government policy may include, among other things, the following:

- Introduce diversity in the sources of primary energy used for power generation and therefore reduce dependence on any dominant energy source.
- Reduce the environmental impact of electricity generation and distribution.
- Incorporate resilience considerations into energy planning.
- Reduce the impact on the economy of volatility in pricing of imported fuels used in power generation.
- To encourage use of indigenous resources for energy production.
- To increase access to electricity.
- Reduce the cost of electricity to end users.

While the development of policies and procedures for the addition of renewable energy power generation capacity must align with government policy, investments in generation capacity should also conform with electricity system expansion plans. Such plans could be in the form of least cost generation expansion plans, or integrated resource and resiliency plans (IRRPs) or similar. Among other things, such plans identify the resource requirements and approximate timing of these requirements to assure a defined level of power supply to electricity customers at the most economic cost, subject to the requirements of relevant government policies applicable to the electricity sector. System expansion plans normally consider the long term (20 years or more), with relatively firm identification of projects for the short-term, with projects identified for later periods subject to periodic review.

System expansion plans, upon approval, serve as the starting point for the addition of new generation capacity and usually involves modeling and simulation of the generation system, taking into account technical and economic variables for all feasible generation alternatives, providing information to facilitate selection of the optimal generation investment path, subject to the relevant policy constraints.

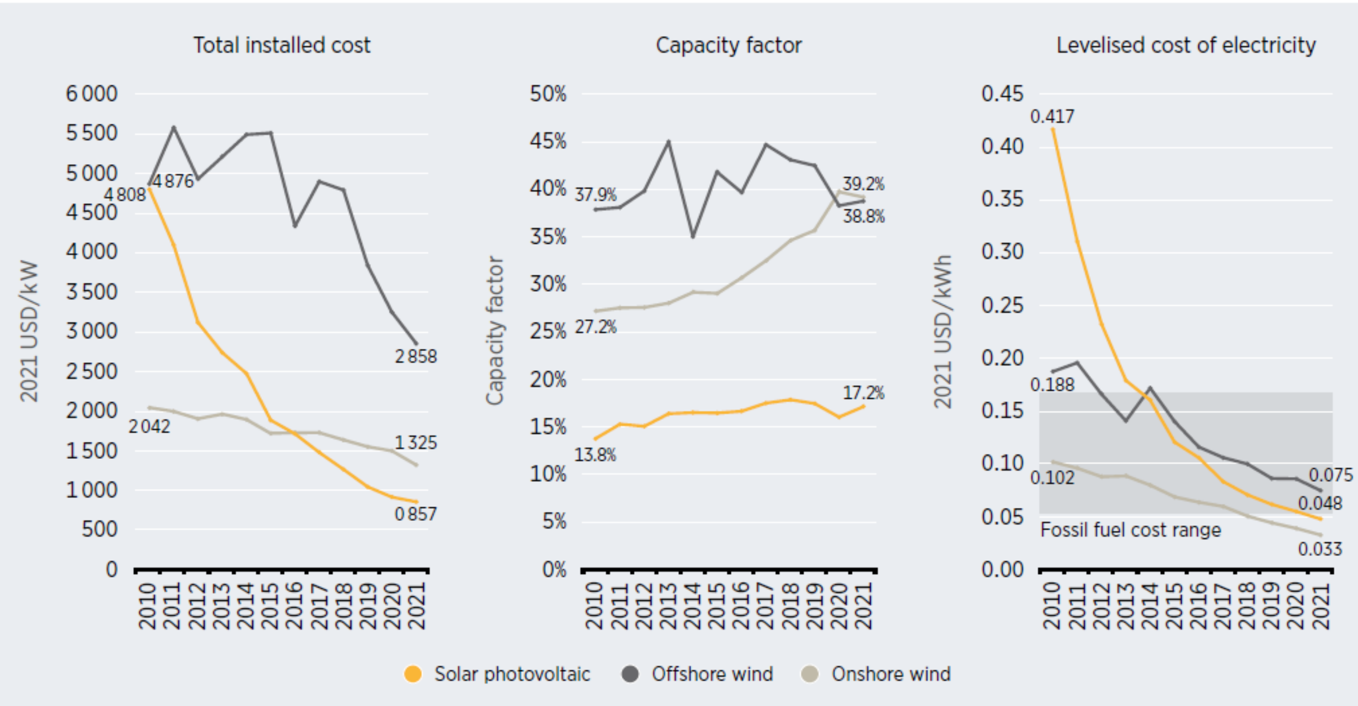
In developing system expansion plans, consideration is given to, inter alia:

- Historic demand and consumption patterns.
- Projections of demand and consumption growth, influenced in turn by projections of national economic growth.
- The performance of existing power generation units and planned retirement timeframes for each.
- Fixed and variable costs for candidate projects considered for inclusion in the expansion plans.
- The economic value of electricity supply reliability.

3.3 Cost Competitiveness of Renewable Energy Technologies

In the early development of renewable energy power generation facilities, the installed cost, and consequently the average cost of electricity was relatively high compared to fossil fuel technologies. As such, governments who pursued development and use of such technologies had to design and implement support schemes to encourage renewable energy development. As renewable energy technologies have matured, with use increasing globally, installed costs, and consequently the average cost of electricity generated by such facilities have fallen significantly, and are now, in some cases, in a similar range, or even lower priced than fossil fuel technologies, as shown in Figure 2 below.

Figure 2 Global Weighted Average Total Installed Costs, Capacity Factors and LCOE of Newly Commissioned Utility-Scale Solar PV, Onshore and Offshore Wind, 2010 - 2021



Source: IRENA

With renewable energy power generation facilities proving to be cost competitive with fossil fuel technologies, as shown in Figure 2, the need for support schemes to promote the development of such facilities is not as great as before. As such, the strategies and options that may be used in procurement of utility-scale renewable energy power generation facilities do not deviate substantially from those used to procure other power generation technologies. A number of these strategies, categorized as competitive and non-competitive procurement strategies, are described in Section 3.4 and Section 3.5 below.

3.4 Competitive Strategies to Utility-Scale Renewable Energy Generation Procurement

3.4.1 Open Competitive Solicitations

Open competitive solicitation has become a widely used strategy, across many jurisdictions, for procuring new renewable energy power generation resources. The intent in procuring renewable energy generation, through a competitive process, is to secure renewable energy generation at the lowest cost to rate payers. Open competitive solicitation is a formal process, usually tied to the jurisdiction's near-term power generation requirements, where the process owner issues a request for proposals (RFP), receives and evaluates qualifying bids, recommends or issues licences to winning bidders, and facilitates negotiation of contracts (typically power purchase agreements) between winning bidders and the off-taker (utility). As indicated, key aspects of the open competitive solicitation process include:

1. Developing and issuing an RFP to solicit bids for the provision of the required power generation capacity.
2. Evaluation of bids according to clearly defined criteria.
3. Negotiation of power purchase agreements (PPAs).
4. Issuance of licences.

Further details are given on aspects (i), (ii) and (iii) in the sections below. As aspect (iv), issuance of licences, relates to both competitive and non-competitive processes, it is addressed later in Section 3.6.

3.4.1.1 Requests for Proposals

A request for proposals is a document that announces a project, describes it and solicits bids from qualified developers to complete it. RFPs describe the organization soliciting bids (the process owner), the scope of the project being undertaken, and the criteria for evaluating bids submitted. By detailing project needs in an RFP, the process owner can gauge how well each bidder understands the project. RFPs help process owners ensure transparency and show the public they are accountable for project goals and developer choices. Critical components of an effective renewable energy RFP include:

1. A clear description of the procurement goals and objectives – the capacity being sought, the development timeline, the types of technologies to be considered, and how these objectives were arrived at (through a system expansion plan, or IRRP, etc.).
2. Instructions to potential developers/applicants, including, inter-alia, administrative requirements for submission of proposals, the required structure of proposals, communication arrangements between the process owner and potential developers/applicants.
3. Requirements for information to be submitted by potential developers, relating to the developer's experience and their proposed plans for satisfying the goals and objectives of the procurement process. Required information may include, among other things, the following:
    a. Identification of the developer's ownership group.
    b. The size and type of facility being proposed.
    c. The developer's project financing experience.

   d. The developer's experience in developing projects of a similar nature, as well as information on the individual experiences of the members of the proposed project team.
   e. Detailed description of the technology and equipment to be used, including design drawings, technical specifications of equipment, and costs.
   f. The projected capacity availability and estimated annual energy supplies to the grid.
   g. Sources of supply for all equipment to be used, and information on contractors/sub-contractors to be involved in construction of the facility.
   h. Identification of the proposed site, proof of ownership and the status of acquisition for use in developing the proposed facility, and proof of planning permission to develop the proposed site.
   i. Project implementation schedule.
   j. Operations and maintenance arrangements for the facility being proposed, including warranties and proposed service agreements with equipment manufacturers, suppliers, etc.
   k. Details of proposed project financing and financial model including projected cash flow and proposed tariff etc.
   l. Demonstration that the proposed facility will satisfy environmental requirements.
4. Information on how proposals will be assessed for responsiveness to RFP, and how responsive proposals will be evaluated (this should include the criteria to be used and the weighting of each).
5. A copy of the draft contract/power purchase agreement.

3.4.1.2 Evaluation of Proposals Submitted

Evaluating proposals submitted under an open competitive solicitation process is an inherently complex task because of the vast array of technical details across project proposals and the differences in proposed cost financial and tariff structures, risks, and benefits profiles. Process owners may find it challenging to be both rigorous and efficient in evaluating bids. As the evaluation of proposals is a complex process, process owners will be required to establish a multi-disciplinary team for conducting the bid evaluation process. Such a team can be in-house staff or outsourced and typically reflects a balance of various disciplines including engineering, economics, finance, law, environmental management, etc. in order to make sound decisions with regards to addition of renewable energy generating capacity.

Despite the complexity, process owners may still view open competitive solicitation as a favorable approach, as the in-depth analysis allows selection of the best project with respect to cost and viability and may reduce the risk of contract failure. Evaluation of proposals submitted under open competitive solicitation may be classified broadly under the following categories:

1. Track record;
2. Technical; and
3. Legal, financial, and economic.

The process owner must establish the necessary rules and procedures for evaluating proposals, which should be laid out in the RFP, as indicated in Section 3.4.1.1. Details on the broad categories for evaluating proposals are provided below.

<u>Evaluating Developer's Track Record and Ability to Implement the Proposed Project</u>

As indicated previously, a typical benefit of open competitive procurement processes is that they may reduce the risk of contract failure. In that regard, a major part of the evaluation process may include assessing the following:

- The competence of the individuals that make up the proposed project team.
- The developer's existing systems for managing engineering, construction, and operations and maintenance of power generation facilities.
- The developer's experience with securing financing and implementing projects of similar capacity, utilizing the same technology as that proposed.

__Technical Evaluation__

The objective of conducting a technical evaluation of bids submitted is to identify, at an early stage, any potential issues or violations that may occur, that are of a technical nature. Technical evaluation of bids submitted will include, among other things, assessment of:

- The proposed technology, assessment of the relevant renewable energy resource and performance ratings of the proposed facility.
- Arrangements for construction, and operations and maintenance of the proposed facility.
- The arrangements for interconnection to the utility network.
- The potential system impact of the proposed facility.
- The environmental impact of the project, against standards set by the relevant environmental regulators.

__Legal, Financial and Economic Evaluation__

Legal, financial and economic evaluation of bids submitted may involve, among other thing, evaluation of the following:

- The ownership structure of the developer.
- Checks on the creditworthiness of the developer, and determination on whether the developers is a fit and proper investor.
- Sources of funds and financing arrangement for the proposed facility.
- Economic analysis of the pricing structure and escalation factors for the proposed project and its impact on electricity tariffs.

3.4.1.3 Process Considerations

As discussed, open competitive solicitation processes have the major benefit of procuring least cost renewable energy generation while best satisfying technical requirements of system planners, such as proximity to load centers, ability to satisfy permitting requirements, etc. With this advantage, however, there are a number of considerations that process owners need to be cognizant of when deciding on pursuing open competitive solicitation of utility-scale renewable energy power generation facilities. These include the following:

1. As the price proposed by the developer is typically the main selection criterion in a bid evaluation, granted mandatory requirements are satisfied, some developers may underbid to secure a contract due to the competitive nature of the procurement. Underestimation of project development costs can be a resource drain on process owners and developers and can compromise system planners' schedule for addition of renewable energy generation, and a country's ability to meet its renewable energy and GHG emissions reduction targets. Conversely, if the use of open competitive solicitation is new to the specific jurisdiction, there may also be overestimation of pricing, as developers may include coverage for perceived risks related to uncertainties about the fairness and timing of the procurement process, and uncertainties about the fairness and timing of the procurement process, and uncertainties about the project development environment in the jurisdiction.
2. Open competitive solicitation processes can place an administrative burden on process owners, as evaluating bids can be complex and time consuming, due to the wide array of bids that may be submitted, with their differing characteristics. Process owners may find it difficult to rigorously evaluate bids and at the same time be efficient in the evaluation process. As indicated previously, however, there are

advantages to this, as conducting in-depth analysis of bids submitted may reduce the chances of contract failure.

3. As open competitive solicitation processes may be lengthy, there is a risk that fundamentals used in preparing bids may change significantly between the issuance of an RFP, bid award and project construction.

4. As they typically require demonstrated creditworthiness and technical ability, competitive procurement processes typically favor established players, and make it difficult for new players to gain a foothold in the market. As such there may not be significant diversity with respect to project size or ownership. Other procurement processes may therefore have to be put in place if process owners desire diversity of ownership and size of facilities, such as customer-owned renewable energy distributed generation facilities.

5. Open competitive solicitation processes typically conform well to power sector planning processes, since they are typically issued based on the outcome of power sector development plans. Additionally, as non-price technical factors may be a part of the evaluation process, there is a higher likelihood that projects which offer a greater technical benefit to the grid may be selected.

6. Open competitive solicitation processes are a fairly flexible approach, where process owners have the option of defining the terms and conditions of an RFP as broadly or as narrowly as they desire. A more open process may allow the market to come up with creative alternatives to meeting procurement requirements.

3.4.2 Renewable Energy Auctions

Renewable energy auctions are another competitive approach for procurement of utility-scale renewable energy power generation facilities. Renewable energy auctions are similar to open competitive solicitations, described in Section 3.4.1, with the main difference being that auctions generally rely on the price criterion for qualified bidders.

Most electricity sector auctions are conducted as sealed bid auctions, with no contract negotiation permitted. As non-price factors are eliminated, process owners obtain a pared-down competitive process which may take significantly less time and resources to administer. The process owner, whether that be a government ministry, an independent regulator, or some other entity designated by the government to conduct the process, should be aware of the importance of auction design, as it can affect the attractiveness of the auction to prospective developers, the transparency of the process and ultimately how successful it is. In considering whether to utilize the auction approach to procure utility-scale renewable energy power generation facilities, the process owner, in consultation with system planners, will need to consider the type of auction to use, how different renewable energy technologies will be treated, as well as define the key components of the auction. These are described in Sections 3.4.2.1 to 3.4.2.3 below.

3.4.2.1 Auction Types

As indicated previously, sealed bid auctions may be the most widely used type of auction in the electricity sector, however, there are other auction types that can be considered, including descending clock auctions and hybrid auctions. These three auction types are described below.

Sealed-Bid Auctions

For sealed-bid auctions, participating developers simultaneously submit their bids, offering a specified capacity at a particular price, with the process owner ensuring that each submitted offer is kept private. For price only auctions, all bids that meet mandatory requirements are then ranked on the basis of price, from lowest bid price to highest. Based on the ranking of bids submitted, the process owner will then make project awards until the aggregate capacity being auctioned is covered. It should be noted that the process owner would normally calculate and set a reference price, which bid prices are expected to be lower than.

Descending Clock Auctions

For descending clock auctions the process owner declares a price for acquiring the required renewable energy capacity. Developers then submit bids for the capacity they wish to provide at the price declared by the process owner. The process owner then progressively lowers the offer price, which would typically result in less developers being willing to participate. The price is lowered until the required aggregate capacity is met.

Hybrid Auctions

For hybrid auctions the first phase operates as a descending clock auction, then the second phase operates as a sealed-bid auction. The intent of this approach is to take advantage of the benefits of both auction systems, where the descending clock phase of the auction allows for price discovery, while the sealed-bid phase of the auction helps with preventing collusion between the participants.

3.4.2.2 Treatment of Generation Technologies

Depending on what the policy objectives are, auctions can be framed to make allowances for a wide range of technologies, or a narrow selection of technologies or even a single technology, etc. As such, auctions can be framed as follows:

A. A fully technology neutral auction, where developers may participate in the auction by submitting bids to supply energy and/or capacity utilizing any technology they choose. This approach would maximize competition between technologies, with the intent of achieving a lower price.
B. A constrained technology neutral auction, where developers may submit bids that utilize technologies specified by the process owner, which may include project proposals which utilize non-renewable energy technologies.
C. A renewable technology neutral auction, where only bids that utilize renewable energy technologies will be considered.
D. A renewable technology specific auction, where only bids utilizing a specific renewable energy technology, such as solar PV, will be considered. This is typically used if policy makers seek to promote a specific renewable energy technology.
E. A project specific auction, where specific parameters of the project have already been determined, and developers submit bids to develop the specific project.

As indicated above, not all the options provided would apply when only renewable energy technologies are being considered. As such, in the context of these guidelines, only options C, D and E would apply.

3.4.2.3 Key Components of Auctions

Auctions for the addition of renewable energy power generation are configured according to the following components:

1. The contract design: this includes the definition of what is being requested, the duration of the contract, the capacity or energy to be contracted, the treatment of generation technologies, as described under Section 3.4.2.2 ,and the reference price.
2. The bidding design: as described under Section 3.4.2.1, different types of auctions can be done. As such the process owner/auctioneer must clearly indicate, to potential auction participants, which type of auction is being done.
3. The commitment bonds required.

3.4.2.4 Process Considerations

As indicated, renewable energy auctions, while having similarities to open competitive solicitations, have the benefit of requiring significantly less time and resources to administer, and can even be conducted via online platforms, where automation can reduce costs. In addition to this feature of renewable energy auctions, there are also several other features that should be taken into account when developing processes and procedures to facilitate addition of generation capacity through renewable energy auctions. These include the following:

1. Contracts resulting from renewable energy auctions, particularly sealed-bid auctions, are typically standardized and non-negotiable, leading to simple bid evaluations and approval processes, resulting in shorter bid-to-contract times, when compared to open competitive solicitations as described under Section 3.4.1. Additionally, due to the simplified process, auctions can be conducted utilizing automated processes, which can reduce administrative costs.

2. As indicated under Section 3.4.2.3, commitment bonds are a key component of auctions. If financial penalties for non-performance are not strict, under-bidding can be a problem in renewable energy auctions. Additionally, as bids submitted as part of an auction process are non-negotiable, process owners may find that projects are not built, or run into difficulties getting completed, if market pricing for equipment and other inputs shifts subsequent to the auction.

3. To yield a functionally competitive auction, the marketplace must be liquid, that is, the market size must be sufficiently large. An insufficient pool of participants can readily lead to collusion effects, which risks decreasing the economic efficiency of the mechanism and can ultimately corrupt the price discovery process. The process owner can influence market size by controlling the frequency of auctions, and the quantity of renewable energy being procured. Additionally, a renewable technology neutral auction, as described in C of Section 3.4.2.2 can increase the pool of developers.

4. Due to how auctions are typically designed, larger, more experienced developers are likely to have a distinct advantage over smaller, less-established developers, which could lead to winning contracts being concentrated among a few developers. If this is a concern for process owners, separate auctions directed at smaller projects and less-established developers could be considered.

5. In price-only auctions, homogeneity is critical because there are no factors beyond price upon which to compare bids. The concept of homogeneity includes homogeneity of the product and homogeneity of project completion risk. Achieving homogeneity of project completion risk is challenging, as permitting, development and financial risk can vary significantly from project to project. Therefore, auction design must include preconditions that establish developer experience and project viability or financial repercussions for non-performance, such as the requirement for performance bonds.

3.5 Non-Competitive Strategies to Utility-Scale Renewable Energy Generation Procurement

In addition to competitive procurement strategies, process owners may also make allowances for renewable energy power generation facilities to be interconnected to the grid via non-competitive processes. Such allowances may include frameworks for interconnection of renewable energy distributed generation facilities, as discussed in GGGI's document titled "Regulatory Guidelines on the Interconnection of Customer-Owned Renewable Energy Facilities to the Grid" dated December 2022, but they may also include allowances for interconnection of utility-scale generation by means of bilateral contract negotiations or feed-in-tariff schemes structured similarly to frameworks for interconnection of DG facilities.

Process owners may make allowances for addition of generation resources to the grid via non-competitive processes as, among other things, these processes may provide flexibility in choosing desirable resources, and may reduce the implementation time for addition of new generation capacity as well as the administrative burden on the process owner. A recognized drawback, however, is that non-competitive processes may not result in the lowest cost projects. Details on bilateral negotiations and feed-in tariff schemes are provided in Section 3.5.1 and Section 3.5.2 below.

3.5.1 Bilateral Contract Negotiations

Bilateral contracts are private transactions where contracts for new renewable energy generation capacity are signed between the developed and the off-taker, without the process owner initiating an official competitive procurement process. Bilateral contract negotiations can be initiated by the process owner soliciting a bid from a particular developer or by a developer approaching the process owner with a proposal to develop a new renewable energy power generation facility. While proposals that are the subject of such negotiations may not be part of a competitive process, and not submitted in response to an RFP, approval would still be required from the process owner, who may conduct an evaluation process to decide on whether to approve the proposed project for development and subsequent interconnection to the grid. Such an evaluation process would be applicable regardless of which party initiated the process. In that regard, the process owner would therefore develop and publish a clear set of procedures for how proposals submitted outside of a competitive process will be handled. Steps laid out may relate to how proposals are submitted and how they are evaluated. Further details on these steps are provided in Section 3.5.1.1 and Section 3.5.1.2 below.

3.5.1.1 Submission of Proposals

Proposals that are submitted on a non-competitive basis are required to be submitted by the developer to the process owner, and should include, among other things, the following information:

- Identification and description of the developer's ownership structure.
- The capacity and type of renewable energy facility being proposed.
- The proposed project team, and indication of the competence of the individuals making up the team.
- Information demonstrating the developer's experience with developing and implementing projects similar to that proposed.
- A description of the developer's existing systems for managing engineering, construction, and operations and maintenance of power generation facilities.
- Technical details of the proposed facility, including preliminary drawings, assessment of the relevant renewable energy resource and performance ratings of the proposed facility.
- Projected capacity availability and estimated annual energy delivery to the grid.
- Tentative project development and implementation milestones.
- Proposed pricing structure.
- Identification of the proposed site, proof of ownership and the status of acquisition for use in developing the proposed facility, and proof of planning permission to develop the proposed site.
- Project implementation schedule.
- Proposed financing arrangements, and the status of such.

3.5.1.2 Evaluation of Proposals

Proposals submitted on a non-competitive basis are still typically subjected to a similar level of rigor in their evaluation, as proposals submitted as part of an open competitive process. As such, proposal evaluation will be typically similar to that described under Section 3.4.1.2.

3.5.1.3 Process Considerations

As discussed, allowances for non-competitive procurement processes, particularly bilateral negotiations, can provide some level of flexibility to process owners in choosing desirable generation resources, may reduce the implementation time for addition of new generation capacity and it may also reduce the administrative burden on the process owner, among other things. There are, however, several other features of bilateral contract negotiations that process owners must take into consideration when developing processes and procedures to facilitate this type of procurement process. These include:

1. Bilateral contract negotiations may be initiated whenever the process owner solicits a bid from a particular developer, or if a developer approaches the process owner with a proposal to develop new renewable energy power generation capacity within the specific jurisdiction. Since such proposals are negotiated individually, the chances of contract failure are reduced.
2. With bilateral contract negotiations, the parties agree on PPA pricing through negotiations. As it is not a competitive process it is less likely that least cost procurement of renewable energy will be achieved,

however under-bidding is less likely to be a concern.

3. Bilateral contract negotiations may facilitate entry by new players into the market if, for example, the process owner and system planners are desirous of using the approach to support projects with technical risks that may make such projects uncompetitive in a competitive procurement process, thus increasing market access to certain developers. On the other hand, if the objective is to expeditiously add capacity, the process owner may decide to select experienced developers with strong track records, particularly developers who already have projects in operation in the same jurisdiction.
4. The bilateral negotiations approach may be seen by process owners as desirable in some circumstances, as capacity can be added incrementally without the administrative cost and long timeline of an RFP process. However, there is typically a minimum capacity for project proposals that may be considered for implementation through this approach, as bilateral negotiations are not intended to be used for small project sizes or for working with small utility customers seeking to develop renewable energy systems. Instead, process owners may develop frameworks for interconnection of renewable energy distributed generation facilities, as discussed in GGGI's document titled "Regulatory Guidelines on the Interconnection of Customer-Owned Renewable Energy Facilities to the Grid" dated December 2022, to facilitate such systems. In addition to a minimum capacity, some process owners may also choose to set a maximum on capacity additions through this process, and reserve larger capacity additions for competitive processes only.
5. As indicated, bilateral negotiations provide a process owner with the flexibility to choose desirable resources. As such, it may provide an outlet to procure supply that may not be least cost but may have significant grid benefits.

3.5.2 Feed-In Tariffs

Use of regulated tariffs, such as Feed-In Tariff (FIT) mechanisms, represent an alternative procurement mechanism for renewable energy power generation to be added to the grid through non-competitive means. These mechanisms typically offer investors some level of certainty over future energy sales, through long-term fixed-price contracts with priority connection and priority dispatch rights. The FIT mechanism can be tailored and set for specific technologies and paid for a fixed number of years. This increases investor confidence, encouraging investments into renewable energy projects. In addition to FITs, regulated tariffs also include Feed-In Premium (FIP) mechanisms, which involve a predefined premium being added on top of a reference price, to compensate investors/program participants for energy supplied to the grid. However, FIT mechanisms have proven to be much more popular than FIP mechanisms and are better at promoting fast renewable energy development, particularly in countries where no electricity spot market exists.

Benefits of FIT policies and mechanisms include the use of a standardized approach, including standardized contracts, which may expedite development of renewable energy capacity. Additionally, they can also open the market to a wide variety of developers and can promote technology diversity by providing revenue certainty for projects based on differing technologies. However, in developing FIT policies and mechanisms, process owners have to take into account a number of issues with such policies. These include concerns that FIT policies do not target least-cost generation and may have higher ratepayer impacts than other strategies, particularly competitive procurement. Additionally, as with similar mechanisms used for domestic applications, the FIT approach, for utility-scale projects, can lead to queuing issues, especially where program caps are in place, and create tensions if procedures for accepting or rejecting new projects are not transparent. In consideration of the benefits and shortcomings of a Feed-In Tariff mechanism to facilitate non-competitive addition of utility-scale renewable energy generation, the process owner could, if policy permits, develop and publish clear rules and procedures indicating the criteria to be used by the process owner to determine what proposed projects would be approved for interconnection to the grid under this mechanism. Further considerations to be taken into account by the process owner when developing a Feed-In Tariff mechanism are included under Section 3.5.2.1 below.

2.5.2.1 Process Considerations

As indicated above, Feed-In Tariff mechanisms can provide process owners with an alternative mechanism that can facilitate expedited development of renewable energy capacity, and allow for diversity in renewable energy technologies, among other things. Additionally, as with other non-competitive strategies to utility-scale renewable energy generation procurement, FIT mechanisms may also reduce the administrative burden on the process owner. There are, however, several other features of Feed-In Tariff mechanisms that process owners must take into consideration when developing procedures to facilitate addition of renewable energy generation capacity through this mechanism. These include:

1. Feed-In Tariff policies and mechanisms encourage the development of new renewable energy generation by providing long-term purchase obligations, transparent prices and standardized contracts. These elements increase investment security and reduce risk, thus improving access to project financing. FIT policies typically include the following provisions:
    a. Guaranteed access to the grid.
    b. Stable, long-term contracts.
    c. Payment levels based on the cost of renewable energy generation.
2. Some FIT policies not only target low-cost technologies but also facilitate contracts being granted to higher cost technologies, which may therefore increase costs to utility rate payers relative to procurement mechanisms that target least cost technologies.
3. Contract standardization may significantly reduce the time between FIT contract application, evaluation and approval. This also reduces the administrative burden on the relevant entities (developers, process owners etc.) thus helping the pace of renewable energy deployment. Additionally, contract standardization may also reduce transaction costs for developers and eliminate the need for multi-party negotiations and complex financial structures.
4. FIT programs typically require process owners to invest significant time up front in developing FIT application procedures, in setting FIT rates and in making adjustments from time to time. This, however, typically results in a more streamlined and efficient contracting process when compared to competitive procurement processes, as contracts are standardized and non-negotiable.
5. Compensation rates for energy supplied to the grid by FIT program participants are typically administratively set standard offer rates. Compensation rates can be determined in several ways, with some schemes setting payments based on estimated generation costs of representative projects, while others base payments on avoided costs.
6. Many jurisdictions with FIT programs periodically review and adjust compensation rates, in an attempt to keep payment levels in line with cost trends. One common policy design is degression, where payment levels decrease by a predefined percentage annually. This ensures that projects coming online at a later date receive a lower compensation rate, in accordance with cost declines that result from technology advancement and economies of scale.
7. Policymakers and process owners often structure FIT compensation mechanisms to offer different compensation rates to projects with different characteristics, such as technology, capacity, etc. This allows for a wider variety of project types to b financed, built and operated in a given jurisdiction.
8. In many countries, costs associated with compensating FIT program participants for energy supplied to the grid is recovered from rate payers through electric utility bills. However, in jurisdictions where an increase in consumer bills may be deemed unacceptable, budgeted amounts may be set aside for the FIT program and the support scheme is then paid for through taxes.
9. Characteristics of FIT policies or programs, such as limits on total program capacity, or eminent administrative changes that can impact project economics may cause developers to attempt to reserve a spot in the queue, without doing due diligence on their projects.
10. A concern expressed by utilities regarding the FIT approach is that such programs might promote projects that provide lower value to utilities and their customers, in terms of cost, reliability, and production efficiency, relative to projects that are procured via competitive means. Additionally, FIT programs may exacerbate utility concerns over renewable energy integration and grid reliability. Utilities with an obligation to buy energy from FIT program participants may have less flexibility in selecting projects that best satisfy their specific needs.

11. Under a FIT program, developers apply for, and receive contracts, on a first-come first-served basis. This, coupled with the standard offer nature of the program, can lead to suboptimal site selection, from the utility's perspective. The utility can therefore see this as conflicting with long-term system planning processes that place emphasis on obtaining the desired mix of generation capacity in the areas where generation is most needed. Furthermore, this can lead to transmission bottlenecks, creating issues particularly in areas where grid requirements are projected to grow and where utilities are not assured rate recovery on grid upgrades. Clear provisions dealing with accepting and rejecting projects, based on system impacts, can help mitigate these issues.

3.6 Licensing

As indicated under Section 3.1, the legal and regulatory framework applicable to the electricity sector establishes the context within which the addition of generation capacity can take place. As the interconnection to the grid and operation of any power generation facility can have attendant technical and safety implications, a typical requirement within the applicable legal and regulatory framework is for power generation facilities to apply for and be granted a licence or permit by the licensing authority (this could be the ministry, the independent regulator or other identified entity) before such facilities can enter into a contract with the utility/off-taker and be interconnected to the grid. This is generally required both for distributed generation facilities and utility-scale facilities, however, the requirements are typically more extensive for utility-scale power generation facilities. For utility-scale power generation facilities, the developer is typically required to submit an application which shall be accompanied by supporting information, which may include information on the property on which the proposed facility will be constructed, technical characteristics of the facility, how development of the facility will be financed, plans for operations and maintenance of the facility, among other things.

4. Priority Considerations in Developing Policies and Procedures

The key considerations and guidelines in developing policies and procedures for procurement of utility-scale renewable energy power generation facilities, as identified by GGGI, have been described in Section 3. These considerations are summarized below.

1. In attempting to reduce heavy dependence on imported fossil fuels, increase energy security, and to meet fulfil commitments for GHG emissions reductions, among other things, OECS territories have set aggressive renewable energy targets, including targets specific to the electricity sector. In order to meet these targets in an orderly manner, the appropriate legal and regulatory framework relevant to the electricity sector has to be in place. The relevant legislation and accompanying regulations should clearly indicate the type of electricity market arrangement, if independent private participation is allowed in electricity generation, transmission, distribution and supply activities, and it should also clearly define the roles of the major stakeholders, identifying the process owners for system planning and procurement activities, among other things.

2. There are a number of different strategies that can be taken when conducting renewable energy generation procurement activities. These strategies are generally grouped into competitive and non-competitive procurement processes. Two competitive strategies are described under Section 3.4, namely: open competitive solicitations and renewable energy auctions. Key aspects of these strategies, as described in detail under Section 3.4.1 and Section 3.4.2 are provided below.
    a. A widely used approach in generation procurement, including renewable energy generation procurement, is open competitive solicitations. This is a fairly flexible approach, where process owners have the option of defining the terms and conditions of an RFP as broadly or as narrowly as they desire. Key aspects of this approach include: developing and issuing requests for proposals, evaluation of bids according to clearly defined criteria, issuance of licences, and negotiation of power purchase agreements. Major considerations when developing policies and procedures that facilitate open competitive solicitation of utility scale renewable energy generation facilities include:
        - Open competitive solicitations typically conform well to power system development plans. Also, as non-price factors may be a part of the evaluation there is a higher likelihood that projects which are technically beneficial to the grid will be selected.
        - This approach can be an administrative burden on process owners, as evaluation of bids can be complex and time consuming. Additionally, due to the length of the process, fundamental information relevant to bids could change between the issuance of the RFP and contract award.

- As price is typically one of the most significant evaluation criteria, there is the potential for underestimation of bid prices, which can lead to resource drain on process owners, and even the possibility of contract failure. Potential also exists for overestimation of pricing in jurisdictions where this procurement approach is new, thus leading to bidders/developers including coverage for perceived risks.
- Competitive selection processes usually favour established due to requirements for demonstrated creditworthiness and technical ability, making it difficult for new players to gain a foothold in the market. This may also limit diversity with respect to project size and ownership.

b. Renewable energy auctions are similar to open competitive solicitations, with the difference being that they primarily rely on the price criterion to determine contract award, from qualified bidders. In considering whether to utilize the auction approach to procure utility scale renewable energy generation facilities, the process owner, in consultation with system planners, will need to consider the type of auction to use, how different renewable energy technologies will be treated, as well as define the key components of the auction which include the contract design, including the treatment of technology types; the bidding design; and requirement for commitment bonds. Major considerations when developing policies and procedures that facilitate renewable energy auctions include:

- Most electricity sector auctions are carried out as sealed bid auctions, with no contract negotiation permitted. In addition to sealed bid auctions, other auction types that can be used include descending clock auctions and hybrid auctions. These three auction types are described under Section 3.4.2.1.
- As non-price factors are eliminated from the evaluation process, process owners obtain a pared down competitive process which takes significantly less time and resources to administer, as compared to open competitive solicitation.
- Depending on policy objectives, auctions can be framed to make allowances for as wide or narrow a range of technologies as desired. Section 3.4.2.2 describes five (5) different ways auctions can be framed, with respect to technology type. The three (3) that are applicable to renewable energy procurement are: renewable technology neutral auctions, where bids that utilize any renewable energy technology are considered; renewable technology specific auctions, where only bids utilizing a specific renewable energy technology are considered; and project specific auctions, where specific project parameters have already been determined, and developers submit bids to develop the specific project.
- A critical aspect of price-only auctions is homogeneity across bids since there are no factors beyond price upon which to compare bids. This includes homogeneity of product and homogeneity of project completion risk. Achieving homogeneity of project completion risk can be challenging, as permitting, development and financial risk can vary significantly from project to project. As such, auctions must be carefully designed with these issues in mind. Further information is provided under Section 3.4.2.4.

3. In addition to competitive procurement processes, frameworks for addition of utility scale renewable energy generation facilities may also allow for non-competitive strategies to addition of new renewable energy generation facilities. Two such strategies are described under Section 3.5, namely: bilateral negotiations and feed-in tariff schemes. Key aspects of these strategies, as described in detail under Section 3.5.1 and Section 3.5.2 are provided below.

a. As indicated, process owners may make allowances for non-competitive strategies to the addition of utility scale renewable energy generation resources to the grid, as it may have some advantages, as indicated under Section 3.5. One such approach is bilateral contract negotiations where the process owner may solicit a bid from a specific developer, or a developer may submit an unsolicited bid to the process owner for consideration, outside of a formal competitive process. In either instance, however, the process owner may apply an evaluation process to decide on whether to approve the project for development. Major considerations when developing policies and procedures that facilitate bilateral negotiations, as a means of adding utility scale renewable energy generation to the grid include:

- Bilateral negotiations may be seen as desirable to process owners in some circumstances, as capacity can be added incrementally without the administrative cost and long timeline of an RFP process. There is typically, however, a minimum capacity for project proposals that may be considered for implementation through this approach, as bilateral negotiations are not intended to be used for small projects, or to facilitate utility customers seeking to develop renewable energy generation facilities. Frameworks that facilitate addition of generation resources to the grid through bilateral negotiations should make this clear.
- As proposals are negotiated individually, the chances of contract failure are reduced under bilateral negotiations. However, as it is not a competitive process, it is less likely that least cost procurement of renewable energy generation will be achieved.
- While this approach is non-competitive, the information requirements for bids submitted typically resemble that required under open competitive solicitations. As such, proposals submitted as part of bilateral negotiations are typically required to include information demonstrating the developer's experience, competence of the proposed project team, technical details of the proposed facility, etc., as indicated under Section 3.5.1.1. Similarly, proposals submitted are typically subjected to a similar level of rigor as evaluation of bids submitted as part of open competitive solicitations.
- In some instances, process owners and system planners may see bilateral negotiations as a useful approach to facilitate the entry of new players into the market who may be seeking to develop projects that have technical risks that would make them uncompetitive in any competitive procurement process. Additionally, process owners may see bilateral negotiations as an approach that provides them with the flexibility to choose desirable resources, i.e., resources that may not be least cost but may have significant grid benefits.

b. As indicated under Section 3.5.2, allowances for regulated tariffs, such as Feed-In Tariff mechanisms, represent an alternative approach for addition of renewable energy power generation to the grid through non-competitive means. FIT policies and mechanisms encourage the development of new renewable energy generation by providing long-term purchase obligations, transparent prices and standardized contracts, increasing investor confidence and encouraging investments in renewable energy projects. Major considerations when developing policies and procedures/mechanisms that facilitate addition of utility scale renewable energy generation to the grid, through FIT mechanisms, include:
   - FIT programs typically require process owners to invest significant time up front in developing a standardized approach, including standardized application procedures, FIT rates and standardized contracts. This may significantly reduce the time between FIT contract application, evaluation and approval. This also reduces the administrative burden on the relevant entities and may also reduce transaction costs for developers and eliminate the need for multi-party negotiations and complex financial structures.
   - Compensation rates for energy supplied to the grid by FIT program participants are typically administratively set standard offer rates. However, as some FIT policies not only target low-cost technologies, this may also increase costs to utility rate payers, relative to procurement mechanisms that target least cost renewable energy projects.
   - Costs associated with compensating FIT program participants for energy supplied to the grid, are typically covered by rate payers through their electricity bills. However, in jurisdictions where increases in customer bills may be deemed unacceptable, costs may be recovered through taxes.
   - A typical concern expressed by utilities, that may need to be taken into account when developing FIT programs, is that such programs may promote projects that provide lower value to utilities and their customers, in terms of cost, reliability, and production efficiency, relative to projects procured via competitive means.
   - Under a FIT program, developers apply for, and receive contracts, on a first-come first-served basis. This, coupled with the standard offer nature of the program, can

lead to suboptimal site selection, from the utility's perspective.

- Typical FIT program characteristics, such as limits on total program capacity, or eminent administrative changes that can impact project economics may cause developers to attempt to reserve a spot in the queue without doing due diligence on their projects.

4. As indicated under Section 3.6, interconnection to the grid and operation of any power generation facility can have technical and safety implications. As such, a typical requirement of any legal and regulatory framework, applicable to renewable energy generation facilities, is that any entity approved for development of a renewable energy generation facility shall have to apply for, and be granted, a licence or permit by the relevant licensing authority before any contract with an off-taker can be executed, or the relevant facility interconnected to the grid.

5. Conclusions

OECS territories have generally set ambitious renewable energy targets, as expressed in their respective Nationally Determined Contributions (NDC) documents submitted to the UNFCCC, as well as their most recent national energy policy documents. Achieving such targets requires multiple kinds of interventions, including increasing the use of distributed renewable energy power generation, and procuring utility-scale renewable energy power generation facilities. In addition to updating electricity legislation to allow for broader participation in electricity generation, achieving the ambitious RE targets set by OECS Member States requires the appropriate regulatory mechanisms, policies and procedures to be in place so that potential investors can clearly identify the requirements for participating in the sector, including the modalities by which proposals for development of renewable energy power generation facilities can be submitted to the process owner, the criteria to be used to assess proposals, and the contract award and negotiation process.

As indicated in Sections 1 and 2 of this document, OECS territories will generally require a significant increase in their installed renewable energy power generation capacity in order to achieve the renewable energy targets set out in their respective policy documents, with existing utility-scale renewable energy infrastructure largely utility owned. In light of this, GGGI has developed a set of guidelines, as presented in Section 3 and summarized in Section 4 of this document, to provide guidance to regional electricity sector decision makers in developing or improving their own frameworks for procurement of utility-scale renewable energy power generation facilities.

Guidelines presented in this document, as indicated, are of a general nature and are only intended to provide guidance in developing or improving country-specific frameworks. As there are differences in the legal and regulatory framework governing the electricity sector across OECS territories, it is expected that specific frameworks set up in the respective territories may have their own peculiarities.

GGGI understands that some territories in the OECS region require direct assistance in developing or improving their specific renewable energy distributed generation frameworks and has already embarked on providing such direct and targeted assistance. It is expected that these interventions will assist territories in achieving their renewable energy targets.

Appendices

Appendix A: References

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