



FAIR TRADING COMMISSION

CONSULTATION

Review of Feed-in-Tariffs for Renewable Energy Technologies up to and Including 1 MW

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LIST OF ABBREVIATIONS

BLPC	Barbados Light & Power Company Limited
BNEP	Barbados National Energy Policy
CO ₂	Carbon-dioxide
ELPA	Electric Light and Power Act, 2013-21
FIT	Feed-in-Tariff
FTCA	The Fair Trading Commission Act, CAP. 326B
FTCA 2020	The Fair Trading Commission (Amendment) Act, 2020
GoB	Government of Barbados
IPPs	Independent Power Producers
LCOE	Levelised Cost of Energy
NDC	National Determined Contribution
NGOs	Non-governmental Organisations
PV	Photovoltaic
RE	Renewable Energy
REP	Renewable Energy Producer
The Commission	The Fair Trading Commission
URA	Utilities Regulation Act CAP. 282
URA 2020	Utilities Regulation (Amendment) Act, 2020

PURPOSE OF DOCUMENT

Introduction

The Government of Barbados (GoB) has acknowledged and continues to demonstrate its commitment towards exploiting the applicable indigenous energy resources potential as it envisions a near net-zero carbon neutral economy. This thrust towards a fully transformed energy landscape by 2030 is evidenced by the establishment and implementation of the BNEP 2019 – 2030. Government has adopted the utilisation of FIT programmes as a key driver towards the expansion of the renewable energy (RE)¹ sector. Consequently, this policy initiative is expected to contribute to the GoB’s NDC targets², realise energy independence, predominant RE production and consumption, and economic development for Barbados.

On September 24, 2019 the Fair Trading Commission (“the Commission”) which is the sole economic regulator for electricity issued its Decision on FITs for RE technologies up to and including 1 MW-AC. By this Decision, FITs became effective October 1, 2019 until December 31, 2021 and thereafter, revised rates for new market participants were expected to be in place subsequent to the existing rates being expired. New rates are developed through a comprehensive rate-making process and in concert with a review of the programme, the latter being initiated by way of public consultation.

The Commission being cognisant of the imminent economic impact of the prevailing COVID -19 pandemic prior to December 2021 on existing and future price movements of RE technologies, issued a proposal to the public on December 21, 2021 to extend the 2019 FIT Decision until June 30, 2022. Having received no objections from the public, the Decision was extended as proposed. This extended period was considered reasonable to observe the stability of prices for RE technologies and their associated logistics costs so that a determination can be made on how future rates should be treated. Notably, price movements associated with RE technologies to stable levels remained sluggish despite incremental

¹ Renewable energy in this paper refers to only the power generation captured by accredited technologies that are germane to this FIT programme.

² NDCs are contributions from participating country towards meeting Global climate change targets.

contractions in prices and in-stability of these prices continued. In light of this development, the Commission determined it appropriate on July 4, 2022 to further extend this Decision until December 31, 2022. This additional six (6) months will assist the Commission in conducting an extensive monitoring and evaluation of RE technology prices during this period.

Given the aforementioned, the Commission now seeks to fully revisit the existing rates, conditions and terms which are stipulated in this FIT Decision in accordance with amendments to section 4 (3) of the FTCA 2020 and sections 3 and 4 of the URA 2020 of the Laws of Barbados.

This consultation paper therefore seeks to provide stakeholders with specific information about the structure, operation, performance, benefits and attendant issues which were realised during the functioning of the FIT programme and proposals which may be necessary to enhance the operational efficiency of the said programme, so that stakeholders will be able to respond to the questions posed.

It is hoped that through this wide stakeholder consultation process, consideration of the submissions from all interested parties to this document together with the extensive research of Commission Staff will result in rates, terms and conditions that enhance the policy objectives of this FIT programme.

Some objectives of the FIT programme are as follows:

- Encourage local participation;
- Promote RE deployment;
- Increase energy independence;
- Promote RE technology diversity;
- Bring RE awareness to the public; and
- Create economic development.

STRUCTURE OF PAPER

The sections of this paper are presented as follows:

- Section 1 highlights the FIT programme as a path towards a carbon neutral economy;
- Section 2 outlines the regulatory authority of the Commission;
- Section 3 presents FIT programme related issues;
- Section 4 discusses interconnection and cost recovery proposals; and
- Section 5 presents a list of questions for stakeholders.

RESPONDING TO THIS DOCUMENT

The Commission values the input from all stakeholders and notes that from experience, submissions which provide a clear, concise response and rationale to the specific question posed, significantly reduces the time required to assess comments. Where stakeholders comment on issues not directly captured in this paper but consider these to be important, it is recommended that the comments be succinct.

Stakeholders are therefore encouraged to consider the suggested approach when responding to this paper, as this would assist the Commission in expediting the management of this process efficiently.

Submission of Comments

Written comments to this consultation paper can be submitted to the Commission from Monday, November 3, 2022 to Friday December 2, 2022 at 4:00 p.m. All submissions must be made within the allocated timelines. The Commission is not obligated to accept or consider submissions made after 4:00 p.m. on December 2, 2022. Preferably, comments should be submitted electronically in the form of a Microsoft Word format or Portable Document format (.pdf), be accompanied by a cover letter, and be sent to info@ftc.gov.bb. Alternatively, responses may be faxed to the Commission at (246) 424-0300. Mailed or hand delivered responses should be addressed to the Chief Executive Officer at:

Fair Trading Commission
Good Hope
Green Hill
St. Michael
BB12003
BARBADOS

A copy of this document may be accessed on the Commission's website at, <http://www.ftc.gov.bb>.

Treatment of Submitted Comments

Responses from stakeholders will be reviewed and summarised where appropriate. Following this process, the Commission will consider the outcome of this review before making a final determination.

SUBMISSION OF CONFIDENTIAL INFORMATION

Submissions in response to this paper which stakeholders consider to be confidential should be submitted in accordance with section 11 of the FTCA CAP. 326B. The Commission will exercise its discretion with regard to confidentiality requests.

SECTION 1 FEED IN TARIFF OVERVIEW

1.1 Background

A FIT programme allows market participants to benefit from the sale of RE derived electricity to the Barbados Light and Power Company Limited (BLPC) or the incumbent off-taker. Under such a programme, a fixed, contracted price (FIT) is usually paid for 20 - 25 years to the REP or IPP for each kilowatt-hour (kWh) of electricity that is exported to the national grid as is the case with “sale of excess” billing or energy that is pre-purchased by the BLPC prior to it being exported to the grid as is the case with “buy-all-sell-all” billing regimes³.

Ascribed rates for RE technologies under a FIT programme are determined by the Commission after consultation with stakeholders.

1.2 FIT Programme Development

On October 1, 2019 the FIT programme for solar PV, land-based wind, anaerobic digestion, and biomass technologies came into effect. The launch of this scheme became the first FIT programme for these RE generators of up to and including 1 MW-AC in size. This RE initiative replaced the premier programme at the time, the RER, which was conceived by the BLPC, initially as a pilot in 2010 and then made permanent from 2013. The institution of the FIT programme sought existing RER solar PV generators being grandfathered at the existing rate of 41.6 cents/kWh for 20 years.

1.3 FIT Programme Description

The FIT programme comprises the above mentioned RE technologies in a tiered system and includes a provision for community-shared RE projects. Rates which were determined for these technologies are based on a levelised cost assessment and the terms, conditions and structures for the programme mirrors the multi-criteria approach concepts which are espoused in the BNEP. Community-shared RE projects attract a 10% premium on the rate assigned to the applicable RE technology. The implementation of this FIT programme seeks to democratise and liberalise the RE sector and thus underpins opportunities for locals to

³ Accredited RE technologies which are less than 3 kW-AC in capacity are designated to self-consume some of their generation and the excess is purchased by the utility. For systems greater than 3 kW-AC, the total generation is credited at the applicable FIT prior to being exported to the utility grid. See item VIII, page 34 of the of the 2019 Decision.

participate in the sector expansion in a meaningful way. The following (Table 1- FIT Assignment) depicts the eligible RE technologies, capacity size categories and their assigned rates. Under the FIT programme, new entrants (licensees) in the energy market are eligible for these rates during the initial 27- month period provided that unutilised capacity is available. When the total allocated capacity is used up during this period, the terms, conditions and structures of the programme should be subject to an annual review. Any unutilised capacity which remains at the end of the existing FIT programme is automatically incorporated into the new programme.

Table 1 - FIT Assignment

Technology	Size Category	FIT (cents/KWh)	Allocated Capacity (MW)
Solar	Up to 10 KW	42.75	5
	Above 10 KW and up to 100 KW	44.75	
	Above 100 KW and up to 250 KW	41.75	8
	Above 250 KW and up to 500 KW	38.25	
	Above 500 KW and up to 1000 KW	36.25	12.7
Land-based Wind	Up to 10 KW	39.75	3
	Above 10 KW and up to 1000 KW	38.25	
Anaerobic Digestion	Up to 1000 KW	44.25	2
Solid Biomass	Up to 1000 KW	52.25	2
Total			32.7

1.4 Programme Capacity Allocation

A total capacity of 32.7 MW-AC (Table 1) was allocated across the technology size categories of the programme. Ideally, the allocated amount of capacity that is assigned to the FIT programme is underpinned by the capability of the grid and is driven by the appropriate grid studies. This capacity was determined by the Ministry with responsibility for capacity. However, specific allocation of capacity to each RE technology size category was mutually agreed to by the said Ministry and the Commission. Of the four (4) technology categories, solar PV was allocated the dominant share of the total capacity allocation, 25.7 MW-AC. Based on

the Commission's assessment, these capacity assignments were considered to be the most cost-effective in minimising the rate impact on customers. Following is the Commission's interpretation of the operationalisation of the FIT programme.

1.5 Operationalisation of FIT Programme

Once a complete RE project application is received by the Ministry with responsibility for licensing and this is approved, the capacity of the RE project should be deducted from the total programme capacity. This process is continued within the programme schedule until the total capacity is exhausted. When the cumulative capacity of accredited projects reconciles with the total programme cap, there is no more available capacity to be assigned to other potential projects. It is important to note that no rate should be applied to other projects on depletion of the last unit capacity (KW) of the total programme cap. Total depletion of the program cap should signal the need for a review of the programme; in circumstances where the cumulative licensed capacity of RE projects is observed to be substantially below the programme cap for an inordinate length of time during the programme schedule, this should automatically signal the need to review the programme as well.

Effective monitoring of the cumulative capacity of accredited projects to their full installation during the programme schedule is essential in order to inform on the amount of available capacity and to determine the frequency at which the total capacity is being utilised. This crucial information from the energy market forms part of the critical decision making tools in a review of the FIT programme. A comprehensive monitoring regime also plays a critical role as a measure of control and cost containment of the FIT programme and also provides an opportunity to evaluate the cost structures of installed projects against budgeted project costs.

1.6 Status of RE Deployment

At the end of December 2019, the total RE capacity associated with customer sited-generators on the public grid was approximately 24 MW-AC. This capacity increased by an additional 18 MW-AC by the end of December 2020. Grid connected RE continued to increase and reached an estimated 57 MW-AC in capacity by the end of December 2021. Since the institution of this FIT programme, the cumulative RE capacity online surged by approximately 137.50% which is indicative of the keen investment interest in the RE sector. As of June 2022, the total RE

capacity on the public grid was estimated at 64 MW-AC, which represents an increase of 40 MW-AC since December 2019.

1.7 RE Market Expansion

Information on licensed RE project installations (Figure 1) which was provided by the Ministry with responsibility for capacity revealed that for the period October 2019 to December 2021, interest in RE related investments increased significantly. Solar PV projects registered the most installations 1,021 in total, while land-based wind technologies for systems above 10 KW and up to 1000 KW recorded 1 installation. About 2 MW each of unutilised capacity remains for land-based wind, anaerobic digestion, and biomass technologies.

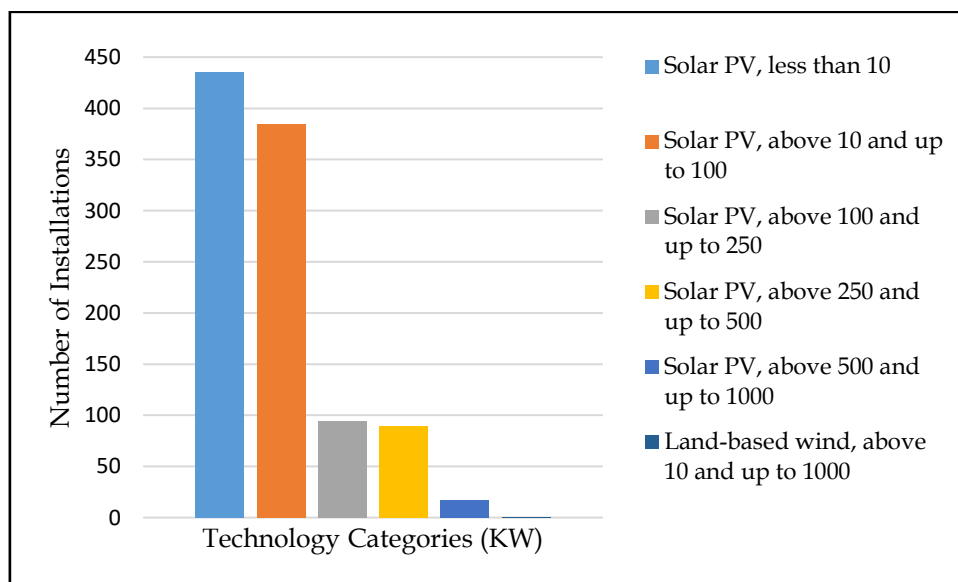


Figure 1- Project Installations 2019 - 2021

1.8 Realised Benefits of the FIT Programme

RE technology-based generation comes with inherent economic, societal and environmental attributes. The exploitation of natural energy resources directly reduces the quantity of fossil fuel required to meet generation demand, fuel expenditure, and the concentration of Greenhouse emissions. By the end of December 2020 and 2021, the energy contribution from RE indigenous sources was about 5.50% and 7.20%, respectively, of total generation⁴ - 951 GWh, and 964 GWh, respectively.

⁴ Total generation means the total energy consumed by customers from the grid.

1.9 RE Generation

The realised energy contributions from these RE generators and the associated fuel saving potential for the year 2020 is depicted in Figure 2. Avoided fuel quantity, costs and emission profiles implies that in the absence of RE contributions, larger fuel quantities are required for electricity generation.

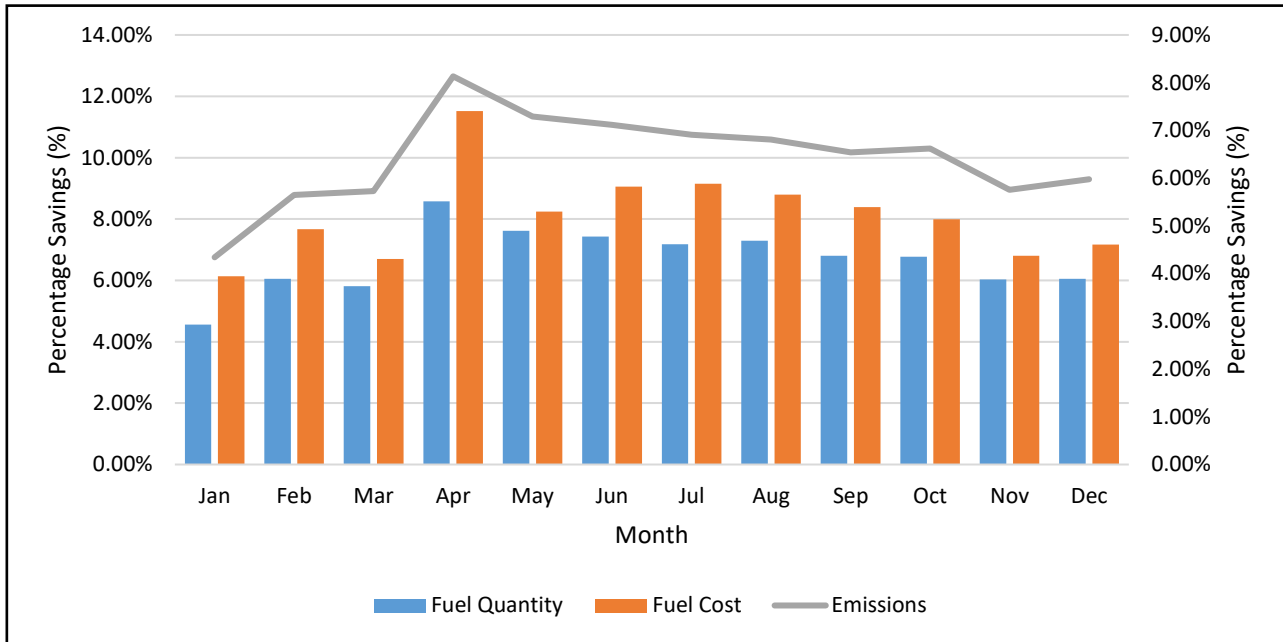


Figure 2 - Estimated RE Savings 2020

The estimated quantity of fuel avoided on a monthly basis was on average 6.68% of the total quantity of fuel consumed per month. The average monthly avoided fuel cost associated with these fuel quantities was 8.14% of the actual cost of fuel purchased monthly. The avoided greenhouse gas emissions per month, when compared with the actual total monthly emissions from power production, was estimated at 6.14%.

Similarly, for the year 2021, an expansion in the RE capacity online improved the energy saving potential of the grid. The variation in avoided fuel quantity, cost and emissions (Figure 3), depicts these savings.

The fuel quantity avoided as a percentage of actual fuel consumed per month was approximately, 9.40%, while the average cost associated fuel savings returned about 11.88%

of the total cost of fuel consumed per month. The emissions avoided per total emissions from thermal plants registered 9.31%. The incremental increase in these statistics implies that greater savings can accrue from higher RE penetration.

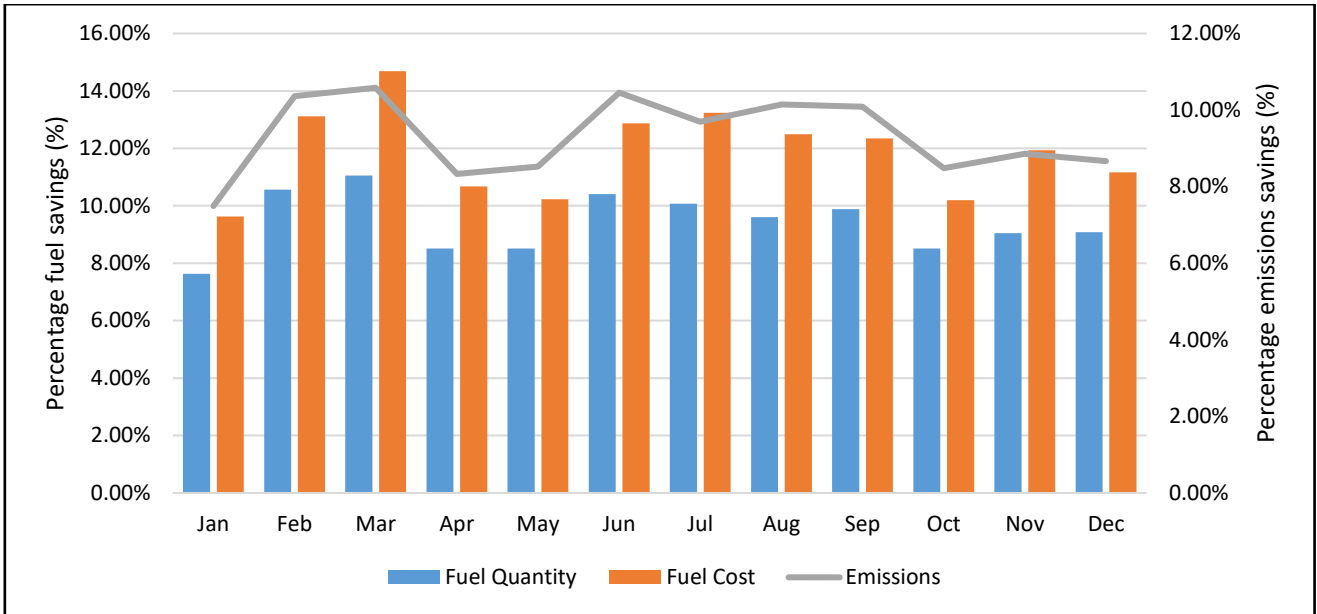


Figure 3 - Estimated RE Savings 2021

1.10 Participation Growth

Membership (Figure 4) under the FIT programme for the period January 2020 – June 2022, increased by 1,339 participants⁵ compared to 1,435 at 30 December 2019. This value represents a 93.31% rise in participation since the operationalisation of the FIT programme.

⁵ The statistics for the profile only reflects the cumulative membership for this period since the launch of the programme. Similarly, the value for online RE capacity is the cumulative capacity during this period.

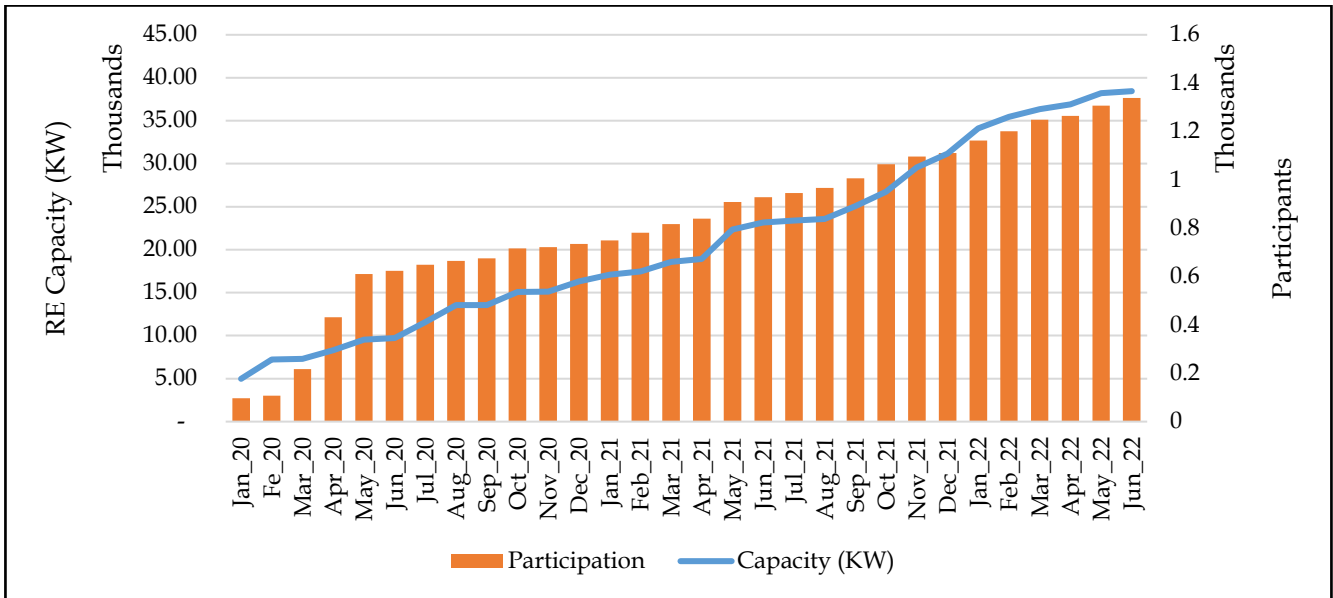


Figure 4 - Participation and Installed Capacity Outlook

Based on the growing interest in the RE sector, increases in participation and online capacity are expected to continue significantly.

SECTION 2 LEGISLATIVE FRAMEWORK

2.1 Introduction

The Commission as the sole economic regulator of utility services has jurisdiction under the FTCA 2020 of the Laws of Barbados to “safeguard the interests of consumers, to regulate utility services supplied by service providers, to monitor and investigate the conduct of service providers, renewable energy producers and business enterprises, to promote and maintain effective competition in the economy, and for related matters.” Similarly, the URA 2020 of the Laws of Barbados expands the role of the Commission with regard to renewable energy producers and associated matters.

Pursuant to section 2 of the FTCA 2020 and URA 2020, the Commission has regulatory oversight of the principles utilized to establish a rate.

““principles” means the formula, methodology or framework for determining a rate for a utility service;”

By virtue of the section 2 of the FTCA 2020 and the URA 2020,

““rates”, include

- (a) *every rate, fare, toll, charge, rental or other compensation of a service provider or renewable energy producer;*
- (b) *a rule, practice, measurement, classification or contract of a service provider or renewable energy producer relating to a rate; and*
- (c) *a schedule or tariff respecting a rate;”*

Additionally, section 2 of the FTCA 2020 states that, ““Independent power producer” means a commercial entity other than an electric utility, which

- (a) *produces or stores; and*
- (b) *supplies*
electricity using renewable energy resources for sale to the public grid;

“public grid” means the grid to which the public has access for the supply of electricity;

“renewable energy producer” includes a generator, distributor or person who stores and supplies electricity generated from a renewable energy resources for sale to the public grid;”

Pursuant to section 4(3) of the FTCA 2020, the Commission has the regulatory authority to:

- (a) establish principles for arriving at rates to be charged by service providers and renewable energy producers;*
- (b) set the maximum rates to be charged by service providers and renewable energy producers;*
- (c) monitor the rates charged by service providers and renewable energy providers to ensure compliance;*
- (d)*
- (e)*
- (f) carry out periodic reviews of the rates and principles for setting rates of service providers and renewable energy producers;“*

The Commission’s duty to consult with the public on the aforementioned is stipulated under subsection (4) which states that:

“The Commission shall, in performing its functions under subsection (3)(a), (b), (d), (f) and (g), consult with service providers, renewable energy producers, representatives of consumer interest groups and other parties that have an interest in the matter before it.”

2.2 Information Gathering

Subsection (4A) outlines the Commission’s function with regard to data requests from specific entities,

“The Commission shall, in performing its functions under subsections (3)(a),(b), (c) ,(d), (e), (f) and (g), request

- (a) a service provider;*
- (b) a renewable energy producer; or*
- (c) a licensee under the Telecommunication Act, 282B or the Electric Light and Power Act (2013-21) to provide the Commission with information relating to its operations, finances or such other information as the Commission may consider necessary to perform its functions.”*

Similarly, section 3 (2A) of the URA 2020 the Commission can request data from a service provider. This section states that, *“In performing its functions under subsection (1), the Commission may request a service provider to provide the Commission with information relating to its operations, finances or such other information as the Commission may consider necessary to perform its functions.”*

The Commission’s powers are derived from **section 3(1)** of the URA, which sets out its functions. Section 3(1) (a) to (c) states:

“The functions of the Commission under this Act are, in relation to service providers, to

- (a) Establish principles for arriving at the rates to be charged;*
- (b) Set the maximum rates to be charged;*
- (c) Monitor the rates charged to ensure compliance”.*

Section 24B (1) of the URA 2020 stipulates that, *“The functions of the Commission, in relation to a renewable energy producer entering into an interconnection agreement or other agreement to supply electricity to the public grid, are to:*

- (a) establish principles for arriving at the rates to be charged;*
- (b) set the terms and conditions of the agreements;*
- (c) set the maximum rates to be charged under the agreements; and*
- (d) direct renewable energy producers to submit the proposals for the rates and terms and conditions relating to their agreements.”*

2.3 Duty to Consult

Further to subsection (1), section 24B (2) states that:

“The Commission shall consult with renewable energy producers, representatives of consumer interest groups and other interested parties and shall have regard to:

- (a) the national energy policy;*
- (b) the national environmental policy;*
- (c) the requirement to promote renewable energy and to enhance the security, affordability, safety and reliability of the supply of electricity.”*

Additionally, subsection (3) outlines what the Commission is required to consider as it executes its functions set out in subsection (1) (a); subsection (3) provides that “the Commission shall have regard to:

- (a) the promotion of efficiency on the part of renewable energy producers;*
- (b) ensuring that an efficient renewable energy producer will be able to finance its functions by earning a reasonable return on capital;*
- (c) such other matters as the Commission may consider appropriate.”*

SECTION 3 FIT PROGRAMME ISSUES

3.1 Background

This tranche of the FIT programme was scheduled to conclude at the end of December 2021, however, it was extended by twelve (12) months as a consequence of abnormal price increases on RE technologies from the ensuing COVID-19 pandemic. Continuous monitoring of the programme during this time was specifically directed towards understanding the costs drivers and their impact on the stability of RE technology prices and how soon these impacts were likely to subside to an acceptable level. The extension also provided an opportunity to observe any operational challenges with the programme. It is common to anticipate teething issues to evolve during the implementation phase of a new programme. Some of these issues include but are not limited to, monitoring and evaluation, information asymmetry, grid connectivity, permitting and authorisation, and gaming⁶. These will be presented for discussion in the following sections.

One of the most difficult tasks in a FIT programme resides in the rate-making process; this challenge involves achieving a delicate balance between the interest of the utility, IPPs, REPs, and customers when determining an appropriate rate that is reflective of the existing market conditions. At the same time, the rate determined should allow IPPs and REPs an opportunity to achieve a fair return on their investments without imposing a significant and unreasonable burden on the rates customers are expected to pay for the electricity service to be received.

Further consideration is also given to the changes in the power market and how these impact the utility's ability to provide a sustained service to customers; this brings into perspective the central role of the utility as part of the evolving energy transition towards RE and the recovery of prudent cost to be borne by the utility. In order to achieve rates that meet these objectives, RE project information must be accurate, valid and reliable. Additionally, participants should maintain programme compliance so that the maximum benefit can be realised. The frequency of data collection and review of said data is also an important part of programme monitoring in order to achieve optimum programme effectiveness.

⁶ These are usually counterproductive approaches which potential or established market participants employ to obtain an unfair advantage which financially benefits their interest alone.

3.2 Data Collection

The quality and timing of actual RE project information is a crucial aspect of rate determination. During the first 27 months of the FIT programme, a formalised data collection process was developed in order to garner RE project data from REPs. This authority by the Commission to request information from REPs is stipulated under the FTCA 2020 and the URA 2020. The enforcement of this legislative provision is hoped to remove the challenge of access to verifiable data from REPs. The Commission is aware of the concern of REPs that RE project information is kept confidential. This issue has resulted in a general reluctance from many REPs to release RE project information to the Commission. As an experienced regulator, the Commission has had no issue maintaining the confidentiality of information it receives. Any information which REPs may deem confidential should be submitted in accordance with section 11 of the FTCA 2020.

RE project information that is submitted to the Commission will only be used to assist in determining market reflective rates for the RE sector and as such, may be requested from licensees on a routinely or on a needs basis, where warranted.

Overall, the key intent of data collection is to be able to assess the movement of proposed RE project costs of entrants to the RE market and be in a better position to develop accurate FITs.

3.3 Duration of FIT Programme

An initial period of 27 months was considered a reasonable timeframe and this duration was intended to capture the frequency of capacity utilisation across the RE technology categories. Additionally, this period was long enough to provide a level of certainty to investors and also took into account the interrelated processes from permitting and authorisation, financing and the development of RE projects. Achieving intended policy objectives under this programme were largely dependent on the efficiency of the said processes.

Solar PV projects above 500 KW-AC and up to 1 MW-AC, may take up to 1-2 months per MW-DC to build, unlike smaller projects which can be completed quickly. The Commission

indicated a move towards annual reviews in its 2019 Decision but now considers a new programme duration of 24 months provided that the collection of data is adequate during this timeframe. During this proposed timeline, RE technology price movements in the Barbados market and potential global impacts are expected to be tracked more frequently. As previously mentioned, a review of capacity utilisation shows that the investment interest in RE has increased. Due to this increased interest it may be prudent to reduce the programme duration to address the demand effectively.

- 1) **Do you consider that with improved access to RE project information, a 24 month period would be reasonable for the duration of the FIT programme? Please provide a reason for your response.**

3.4 Capacity Caps

Caps signal the amount of investment potential that is required by the RE market over the duration of the FIT programme. Based on the 100% RE goal by 2030, about 60 – 80 MW-AC of RE capacity may be required on an annual basis. To meet this target safely, the amount of allocated capacity should be coordinated with expected thermal plant retirements and prescribed according to the capability and limitations of the electricity grid. Monitoring the impact of installed projects on the grid during the programme cycle as the cap value depletes should signal whether the cap should continue or be reduced. This depends on the location and frequency and volume of project installations when compared to the total cap. Another issue which may be related to the cap relates to the modification of RE projects after these are installed; particularly those projects which are required to be registered but not licensed. Projects under the FIT programme sized below 5 KW-AC for domestic applications and 25 KW-AC for non-domestic purposes do not require a license. Un-solicited modifications to projects in these categories collectively, if not adequately monitored may create operational issues for the grid. Adherence to FIT programme stipulations helps contain costs.

- 2) **What do you consider to be a reasonable solution to address un-solicited modifications to RE projects which do not requiring a license?**
- 3) **What action should be taken with respect to the programme cap when grid stability issues develop during the FIT programme schedule?**

3.5 Project Caps

For a given RE technology band, the project cap restrains the amount of capacity that can receive the ascribed FIT. These limits that are assigned to the specific RE technology category allow diverse rates to be offered to participants. The allocation of capacity to the project categories aims to control the cost impact offered by each category. Additionally, monitoring of project caps ensures that the total volume of licensed capacity under each project cap reconciles with the value assigned to the project cap; this provides a second layer of monitoring and cost control for the programme. The Commission utilises the allocated project caps to assess the rate impact on customers over the short to medium term⁷. Compliance with these limits ensures that the expected impact is at minimal, contained. There is a concern that project caps may inhibit potential investment when the cap is reached or near exhaustion and this signals that there is no more opportunity to invest.

- 4) **What are your views on removing or retaining the allocated capacity for the RE technology deployment caps? Please provide a reason for your response.**
- 5) **How does information on projects caps impact your investment decisions for RE projects? Please explain your response.**
- 6) **Should any of the capacity ranges be adjusted or removed? State a reason for your response.**

3.6 Tariff Eligibility

A licensed project is eligible for the FIT assigned to the specific RE technology band provided the licence is issued within the FIT programme duration period. A major concern is the type of treatment that should be given to a complete submitted RE project application when received close to the programme expiry date. This situation may particularly arise due to a long duration period; more than a year for FIT programmes. Where RE technology prices typically may change annually – trend down, this means that when the FIT programme exceeds a year, RE projects which are submitted near the end of the programme will benefit from a reduction in the technology costs which may not be reflected in the existing FIT. In essence, these accredited projects should be assigned a rate which would ideally capture the

⁷ Two to five years is considered the medium term

technology price reduction or increase. Hence, assigning the existing rate at the time may not be prudent.

- 7) **How should this specific situation be addressed under the FIT programme? Give a reason for your response.**

3.7 Gaming Activities

Gaming is the term used to describe situations which are exploited by investors to obtain unintended benefits under the FIT programme. Under this FIT programme the initiative of one project per parcel of land⁸ was stipulated to address the issue of potential gaming. While at the time the Commission considered that this proposal was a good disincentive against a RE project being subdivided into multiple projects to benefit from a higher tariff associated with the project division, the Commission does not have regulatory oversight over this situation. Other concerns may relate to situations where the owner of adjacent lands, seeks to build smaller projects at higher tariffs. Another issue which may arise is subdividing the land to build smaller projects at higher tariffs. Gaming activities can impact the cost effectiveness of the FIT programme and solutions to these can be developed through meaningful discussion with all RE authorising stakeholders.

- 8) **What approaches do you consider would be reasonable to mitigate against these types of gaming issues? Please provide a reason for your response.**

3.8 Billing Mechanism

The “buy-all sell-all” billing mechanism allows the off-taker to credit each kWh of energy that is generated by the RE system at the prevailing FIT, even if this energy is not exported to the grid. This billing mechanism currently applies to all RE technologies above 3 KW-AC and above in size. The portion of this energy that is self-consumed by the customer is then billed at the existing Fuel Clause Adjustment (FCA) and added to the total electricity bill. Notably, the cost associated with the self-consumption ideally captures grid-use charges that are associated with the RE system. It is important to note however, that solar PV and wind technologies do not use fossil fuel and therefore should not incur a FCA related charge. While this billing arrangement has been useful as a proxy in recovering some grid-use charges, a

⁸ See item VI of the 2019 Decision.

more logical approach may be adopted which is based on RE system capacity or a demand charge.

Sale of excess is another mechanism which is utilised to bill customers with RE technologies 3 KW-AC and below in size. With this billing arrangement customers are allowed to self-consume energy generated by their RE system and only excess energy is sold to the grid. Given the rapid expansion of the RE market that is envisioned, there may be a need to address grid use charges for these customers with this billing mechanism. As RE use becomes the dominant source of consumption cost allocation becomes a main concern and ideally each customer consuming electricity on the grid is required to pay their fair share of cost.

- 9) **Do you agree or disagree with the proposal to replace the FCA component charge under the “buy-all sell-all” billing mechanism with a monthly grid-use charge? Please support your response with a reason.**
- 10) **What other alternatives can be considered to address the treatment of self-consumed RE under this billing arrangement? Please explain your response.**
- 11) **Should grid use charges apply to customers on ‘sale of excess’ billing mechanism to ensure fair allocation of cost? Please explain your response.**

3.9 FIT Agreement

Although some RE technologies do not consume fossil fuels to generate electricity and incur very little operation and maintenance costs, the capital cost associated with harnessing the energy resource can be more expensive compared to conventional generation technologies. For some of the higher capacity categories under this FIT programme, a FIT Agreement which may be a simplified Power Purchase Agreement (PPA) may be required by some financial institutions in order to commit to financing the RE project. Potential RE projects that are above 100 KW and up to 1 MW in size may be ideal candidates. Typically, PPAs are developed between the off-taker (incumbent utility) and the REP. Where a form of PPA may be required by a financial institution or parties, it may be beneficial for the entity to use an existing PPA template to develop the specific content that may be required.

- 12) **What is your perspective on the provision of a standard FIT Agreement for participants under this FIT programme? Please indicate a reason for your view.**
- 13) **Should the FIT Agreement apply to all RE technology categories? Which RE technology size categories should be included in the agreement? Please support your response with a reason.**
- 14) **Do you agree that if a financing agency requires a FIT PPA for specific RE projects under this programme that this can be developed by the negotiating parties for efficiency?**

3.10 Community-Shared Projects

Under the BNEP, one of the key objectives is to provide locals with an opportunity to participate in the development of the RE market. In addition to the general RE technology size categories stipulated, and in keeping with the objective to spur greater business development amongst local participants, the community-shared project component was introduced. There are many community-based RE business models available. Investors seeking to explore the community-shared provision are free to develop their own business model.

One concept of community-shared projects is that by design these aim to address some of the issues faced by customers who wish to participate in the RE transition but are unable to do so directly due to their lack of land, location, building type, ownership, or lack of upfront capital. These projects allow utility customers to purchase shares in a RE project which translate to a monetary equivalent based on the total energy sold to the grid. This quantum of compensation is then used to off-set their monthly utility bill and appears as a credit on the bill.

The intent of including a community-shared project concept was to allow participants to develop their own RE business model based on the following criteria:

- (i) a minimum of fifteen (15) residential customers or entity investors (participants);
- (ii) no more than 50% ownership of a single project by a single entity or individual;

- (iii) individuals are not restricted to the same geographical area;
- (iv) projects may include micro and small businesses as defined by the Small Business Association of Barbados;
- (v) each project is required to be under one (1) umbrella company;
- (vi) participants must demonstrate ownership and percentage share; and
- (vii) individual participants must be eighteen (18) years and older.

Operation of this type of initiative depends on the conceptual model adopted by the specific entities. A summary of how this may function is as follows:

- (i) participants may be a company, organisation, and group of people;
- (ii) shares are purchased by the participant/subscriber from the subscriber organisation/company for the RE project;
- (iii) the subscriber organization/company sells the monthly energy (kWh) produced by the RE project to the utility/off-taker;
- (iv) the electric utility/off-taker will convert the purchased kWh to the dollar value for each subscriber/participant⁹
- (v) the subscriber receives a credit from the utility based on the share in the RE project and this amount is deducted from the monthly bill.
- (vi) Based on the credit amount the utility may issue a cheque on a routine basis to the subscriber.

In review of the FIT programme performance, no information on the development of this segment of the programme was available. This suggests that more needs to be done to develop this component of the programme as it has the potential to strategically provide an opportunity for more locals to participate in the transition to RE. During the programme period the Commission received some enquires about this segment of the programme.

15) Did you have any challenges with the initiation or implementation of your community-shared project? What were these challenges and how were these addressed? Please explain your response.

⁹ Note that in this case it is assumed that each subscriber/participant is a utility customer.

- 16) What other considerations should be addressed to assist the development and implementation of community-shared projects? Please give a reason for your response.**

3.11 FIT Modelling Assumptions

Rates for future REPs are developed by modelling cost estimates - capital, development, operation and maintenance, and abandonment expenditures for potential RE projects. This information is ordinarily acquired from key stakeholders prior to and during the consultation process and is complemented by research undertaken by the Staff of the Commission. The successful outcome of this rate-making exercise continues to be driven by reliable and verifiable technical and financial data.

During this consultation process, these principal cost inputs and related factors - performance, operation, and financial assumptions which are depicted in Table 2, Table 3, and Table 4, respectively, will be re-evaluated. It is anticipated that from this assessment, changes in RE project costs can be considered and adjusted to reflect balanced rates for the RE sectors where appropriate.

Upward price trends in RE technology equipment and associated logistics costs were evident during 2021, primarily as a consequence of the COVID-19 pandemic. Solar PV module price movements inside China for May 2020 averaged BDS \$0.48/Watt-DC, BDS\$ 0.50/Watt-DC in May 2021 and BDS\$0.56/Watt-DC for May 2022. For the same time periods, the United States average prices for the same solar PV module was BDS\$ 0.80/Watt-DC, BDS\$ 0.64/Watt-DC, and BDS\$0.64/Watt-DC, respectively. To date, module prices averaged BDS \$0.57/Watt-DC in China and the cost of freight from China to North America for October 2019 to October 2020 moved from BDS\$ 2,538 to BDS\$ 4,500. This cost significantly increased in October 2021 to BDS\$ 21,034. As of May 2022, shipping prices contracted to about BDS\$ 16,472 and is currently about BDS \$7,080 which is indicative of a reduction in pressure on the overall price associated with RE equipment. Notably, unpredictable price movements have been recognised as a contributing factor for delays with RE project deployment in the near term. With respect to

solar PV module prices, these are expected to decline by BDS\$ 0.02 - 0.04/Watt-DC during the second-half of 2022.¹⁰ Prices for wind turbines are expected to remain high due to steel price increases and other material costs.

3.12 Installed Cost

The installed cost of a RE project communicates useful information to investors about the affordability of a project. While the solar industry utilises \$/kW-DC as a metric, the Commission has adopted a \$/kW-AC. The conception of FITs is primarily based on relatively stable pricing. It is anticipated that abnormal price increases associated with RE technologies may impact the installed cost of potential RE projects through 2022. As previously mentioned, the Commission depends on the submission of these specific details from potential REPs. It is hoped that during this consultation process, the provision of essential project details will provide greater clarity on the movement of RE technology prices in our local market and assist in making a fair judgement on RE rates.

- 17) How has the total installed cost for RE projects changed in the Barbados RE market to date? Please provide specific details to support your response.**

- 18) Which other performance input assumptions in Table 2 in your opinion should be adjusted based on our current RE market conditions? Please provide a reason for your response.**

Interconnection cost is included in the tariffs for RE technologies above 500 KW-AC. The BLPC absorbs this cost for systems below 500 KW-AC. However, there may be locational situations which can cause RE project sizes below this threshold to incur some costs. This issue will be addressed separately in an upcoming part of the document.

¹⁰ See <https://about.bnef.com/blog/solar-10-predictions-for-2022/>

Table 2 – Installed Cost and Performance Input Assumptions

Technology Size Category	Installed Cost¹ (BDS \$/KW)	Net Capacity Factor (%)	Annual Degradation (%)	Analysis Term (Years)
Solar				
Up to 10 KW	\$6,088	18%	0.5%	20
Above 10 KW and up to 100 KW	\$4,652	18%	0.5%	20
Above 100 KW and up to 250 KW	\$4,194	19%	0.5%	20
Above 250 KW and up to 500 KW	\$3,696	19%	0.5%	20
Above 500 KW and up to 1000 KW	\$3,580	20%	0.5%	20
Land-based Wind				
Up to 10 KW	\$8,292	25%	0.5	20
Above 10 KW and up to 1000 KW	\$5,712	30%	0.5	20
Other Technologies				
Anaerobic Digestion	\$16,354	75%	0	20
Solid Biomass	\$10,740	91%	0	20
<i>1. Including funding of reserve accounts and other financial-related costs, and including \$300/KW for all projects above 500 KW (see also 'Interconnection Cost' note below).</i>				

3.13 Operating Input Assumptions

The operating input assumptions (Table 3) ensure that these expenses incurred by REPs – operating and maintenance, site lease, insurance, project management cost, and land tax, can adequately reflect reasonable costs so that the asset can operate successfully over the contracted period of 20 years. Where some of these inputs may have changed significantly during the course of the FIT programme, these will require adjustments.

- 19) Which of the operating cost assumptions in Table 3 have exhibited a major shift in costs and should be adjusted based on our current RE market conditions? Please explain your response.**

Table 3 – Operating Cost Input Assumptions

Technology Size Category	Fixed O&M (BDS \$/KW-yr)	Site Lease (BDS \$/KW-yr)	Insurance (BDS\$/mille)	Project Mgmt (BDS\$/KW-yr)	Land Tax ³ (% of rev.)
Solar					
Up to 10 KW	\$100	N/A	BDS\$4/mille	Incl. in O&M	0%
Above 10 KW and up to 100 KW	\$35	N/A	BDS\$4/mille ²	\$40	0.95%
Above 100 KW and up to 250 KW	\$35	N/A	BDS\$4/mille ²	\$76	0.95%
Above 250 KW and up to 500 KW	\$35	\$25	BDS\$4/mille ²	\$64	0.95%
Above 500 KW and up to 1000 KW	\$32	\$25	BDS\$10/mille ²	\$60	0.95%
Land-based Wind					
Up to 10 KW	\$70	\$25	BDS\$4/mille	Incl. in O&M	0%
Above 10 KW and up to 1000 KW	\$70	\$25	BDS\$10/mille ²	\$73	0.95%
Offshore	\$240	\$25 ¹	0.4 % of cost	Incl. in O&M	N/A
Other Technologies					
Anaerobic Digestion	\$600	\$25	0.4 % of cost	\$36	0.95%
Solid Biomass	\$475	\$25	BDS\$53/KW-yr	\$36	0.95%
<ol style="list-style-type: none"> 1. Proxy for comparable benefits assumed paid in lieu of a site lease 2. \$4/mille for equipment replacement and \$6/mille for business interruption insurance. Mille = Thousand 3. Rate of BDS 30¢/kWh used as proxy for value of electricity sold to calculate tax. 					

3.14 Financial Input Assumptions

All potential investors may not have all the financial means to enter into a project; an objective of this FIT programme is to promote more local participation. Structuring the terms for these inputs (Table 4) was targeted to achieve this objective at the time.

20) What changes have you observed in the value of percentage debt for the RE technology categories? Explain your response.

21) What other changes do you consider are required to the other input assumptions in Table 4? Please explain your response.

Table 4 - Financial Input Assumptions

Technology Size Category	% Debt	Debt Term (Years)	Interest Rate (%)	Cost of Equity (%)¹
Up to 10 KW	50%	7	6.00%	6.00%
Above 10 KW and up to 100 KW	80%	7	6.00%	14.00%
Above 100 KW and up to 250 KW	75%	7	6.00%	14.00%
Above 250 KW and up to 500 KW	70%	10	6.25%	14.00%
Above 500 KW and up to 1000 KW	70%	10	6.25%	14.00%
Land-based Wind				
Up to 10 KW	50%	7	6.00%	6.00%
Above 10 KW and up to 1000 KW	65%	10	6.25%	14.00%
Other Technologies				
Anaerobic Digestion	50%	15	6.50%	14.00%
Solid Biomass	50%	15	6.50%	14.00%
<p>1. Model solves for FIT rate that meets this equity return target after-tax.</p>				

SECTION 4 INTERCONNECTION OF RE GENERATORS

4.1 Interconnection Cost

Interconnection cost is an important input into the overall FITs. The FIT for RE technologies of less than 500 KW-AC in size do not include an interconnection cost. RE systems which are above 500 KW-AC and up to 1MW-AC in size include a cost estimate of BDS\$ 300/kW-AC for interconnection (Table 2). These generating systems are connected to the distribution network and the applicable rate includes an interconnection cost component that captures the cost of the transformer, switchgear, metering and cabling.

The distribution network is generally assumed to be accessible throughout Barbados. Despite this, the possibility may arise where a potential generator site may not be within a reasonable distance from the existing network infrastructure to readily facilitate an interconnection without the placement of additional groundwork. This apparent situation therefore imposes additional interconnection costs to be borne by either the off-taker or the REP; such costs would not have been reasonably accounted for in the FIT determination for systems below 500 kW-AC. Similarly, the FITs which include interconnection costs for systems above 500 kW-AC and up to 1MW-AC could not have reasonably captured all connection costs that may be anticipated for all REPs connection scenarios. The interconnection costs for RE generators in this capacity range, despite being predictable, could be inadequate for all potential generation sites where this scenario is evident.

In general, REPs which are closer to the grid infrastructure would benefit more from the FIT than those further away from the network who consequently, may incur added expenses to connect the generator. Where these situations arise frequently, these place a financial predicament to investors and the utility. As it relates to ratemaking, the regulator must give consideration to the utility's position in terms of financing its functions pursuant to section 3 (2) of the URA CAP. 282 of the Laws of Barbados.

The following therefore are proposals for the treatment of interconnection for existing and future RE generators under the FIT programme. The ascribed FIT and interconnection cost estimate as noted in Table 2 are applicable to all licensed generators of cumulative capacity equal to the capacity cap of 32.7 MW as stipulated in the 24 September, 2019 Decision.

4.2 Interconnection Cost Treatment

4.2.1 Existing RE Generators

RE Generators up to 500 kW-AC

- (i) Licensed RE generator that may be required to pay interconnection cost due to its location from the grid infrastructure, the BLPC or incumbent utility be required to incur this cost; and
- (ii) All prudently incurred costs of each interconnection to be recovered through an appropriate cost recovery mechanism.

RE Generators above 500 kW-AC and up to 1 MW-AC

- (i) The RE generator be required to pay the full interconnection cost (\$300/kW-AC) that is factored into determining the FIT (Table 2);
- (ii) Where the actual or estimated interconnection cost to be borne by the RE generator exceeds the amount which is incorporated in the assigned FITs (Table 2), the difference in cost should borne by the utility;
- (iii) All prudently incurred costs by the utility to be recovered through an approved, flexible, appropriate cost recovery mechanism;
- (iv) Where the actual or estimated interconnection cost to be borne by the RE generator is less than the amount (Table 2) specified in the FIT, the RE generator is expected to contribute the difference in cost for refund to all utility customers; and
- (v) The recovery of this cost differential should be done through a flexible cost recovery facility. The utility may be required to recoup this cost and pass it on to all customers as a credit.

4.2.2 Future Cost Treatment - Revised FITs

The accessibility to, and the utilisation of accurate financial and technical information from RE resource technologies under the FIT programme remains a pertinent issue. In order to fully deliberate on an effective interconnection cost allocation strategy for potential RE generators, accurate and adequate costing information must be provided to the Commission for appraisal. Given the challenges experienced with garnering current RE project information, including interconnection costing data to date, the Commission is proposing the following measures which should result in greater deployment under the revised FIT programme.

On the issuance of new rates for the RE market, all eligible RE technologies which are up to and including 1 MW-AC in size, associated interconnection costs should be addressed by the following:

- (i) RE projects which are below 500 kW in size and are likely to incur interconnection costs based on the project specific location, the utility be required to incur this cost;
- (ii) Interconnection cost incurred by the utility to be fully recovered through an approved cost recovery mechanism;
- (iii) RE projects which are above 500 kW in size should only include the fixed component of interconnection cost up to the boundary; and
- (iv) Any other cost beyond this point (boundary) to be incurred by the utility. All such cost once prudently incurred should be recouped by the utility through an approved recovery mechanism.

22) What is your opinion on the treatment of interconnection costs proposals for existing generators below 500 kW-AC and above 500 kW-AC to 1 MW-AC? Provide your reasoning.

23) Do you agree with the proposed treatment of interconnection cost associated with new RE generators below 500 kW-AC and above 500 kW-AC to 1 MW-AC? Please support your view with a reason.

24) For RE projects sized above 500 KW-AC to 1 MW-AC in capacity, what changes in related interconnection cost have you observed?

SECTION 5 CONSULTATION QUESTIONS

5.1 Summary of Questions

Following are the list of questions presented throughout this paper with respect to the issues or proposal identified. The Commission welcomes responses from all stakeholders in order to benefit from the widest stakeholder response.

- 1) Do you consider that with improved access to RE project information, a 24 month period would be reasonable for the duration of the FIT programme? Please provide a reason for your response.**

- 2) What do you consider to be a reasonable solution to address un-solicited modifications to RE projects which do not requiring a license?**

- 3) What action should be taken with respect to the programme cap when grid stability issues develop during the FIT programme schedule?**

- 4) What are your views on removing or retaining the allocated capacity for the RE technology deployment caps? Please provide a reason for your response.**

- 5) How does information on projects caps impact your investment decisions for RE projects? Please explain your response.**

- 6) Should any of the capacity ranges be adjusted or removed? State a reason for your response.**

- 7) How should this specific situation be addressed under the FIT programme? Give a reason for your response.**

- 8) What approaches do you consider would be reasonable to mitigate against these types of gaming issues? Please provide a reason for your response.**

- 9) Do you agree or disagree with the proposal to replace the FCA component charge under the "buy-all sell-all" billing mechanism with a monthly grid-use charge? Please support your response with a reason.**

- 10) What other alternatives can be considered to address the treatment of self-consumed RE under this billing arrangement? Please explain your response.
- 11) Should grid use charges apply to customers on 'sale of excess' billing mechanism to ensure fair allocation of cost? Please explain your response.
- 12) What is your perspective on the provision of a standard FIT Agreement for participants under this FIT programme? Please indicate a reason for your view.
- 13) Should the FIT Agreement apply to all RE technology categories? Which RE technology size categories should be included in the agreement? Please support your response with a reason.
- 14) Do you agree that if a financing agency requires a FIT PPA for specific RE projects under this programme that this can be developed by the negotiating parties for efficiency?
- 15) Did you have any challenges with the initiation or implementation of your community-shared project? What were these challenges and how were these addressed? Please explain your response.
- 16) What other considerations should be addressed to assist the development and implementation of community-shared projects? Please give a reason for your response.
- 17) How has the total installed cost for RE projects changed in the Barbados RE market to date? Please provide specific details to support your response.
- 18) Which other performance input assumptions in Table 2 in your opinion should be adjusted based on our current RE market conditions? Please provide a reason for your response.

- 19) Which of the operating cost assumptions in Table 3 have exhibited a major shift in costs and should be adjusted based on our current RE market conditions? Please explain your response.
- 20) What changes have you observed in the value of percentage debt for the RE technology categories? Explain your response.
- 21) What other changes do you consider are required to the other input assumptions in Table 4? Please explain your response.
- 22) What is your opinion on the treatment of interconnection costs proposals for existing generators below 500 kW-AC and above 500 kW-AC to 1 MW-AC? Provide your reasoning.
- 23) Do you agree with the proposed treatment of interconnection costs associated with new RE generators below 500 kW-AC and above 500 kW-AC to 1 MW-AC? Please support your view with a reason.
- 24) For RE projects sized above 500 KW-AC to 1 MW-AC in capacity, what changes in related interconnection cost have you observed?