FAIR TRADING COMMISSION

CONSULTATION

Energy Storage Tariff (EST)

Document No.: FTCUR/CONS/EST/2023-01 **Date of Issue: March 31, 2023**

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LIST OF ABBREVIATIONS

BCESEP	Barbados Clean Energy Storage and EV Policy
BESS	Battery energy storage system
BLPC	Barbados Light & Power Company Limited
BNEP	Barbados National Energy Policy 2019 - 2030
CAPEX	Capital expense
ELPA	The Electric Light & Power Act
EST	Energy storage tariff
EV	Electric vehicle
FIT	Feed-in-tariff
FTCA	The Fair Trading Commission Act, CAP. 326B (as amended)
GoB	Government of Barbados
IPPs	Independent power producers
IRR	Internal rate of return
IRRP	Integrated Resource & Resiliency Plan
LCOS	Levelised cost of storage
MEBD	Ministry of Energy and Business Development
NPV	Net present value
NGOs	Non-governmental Organisations
OHL	Overhead lines
PPA	Power purchase agreements
PV	Photovoltaic
RE	Renewable energy
RPS	Renewable Energy Portfolio Standards
SCO	Synchronous condenser
The Commission	The Fair Trading Commission
URA	Utilities Regulation Act CAP. 282 (as amended)
VRE	Variable renewable energy
V2G	Vehicle-to-grid

PURPOSE OF DOCUMENT

This paper outlines the Commission's process for determining tariffs that apply to energy storage technologies and the provision of ancillary services[1] for the Barbados electricity grid. It is intended to solicit feedback from stakeholders and the general public on the development of EST for energy storage projects as well as the methodology for the determination of the tariff. The specific pilot projects that are being addressed at this stage are:

i. Centralised storage operated by private storage suppliers.
ii. Distributed storage at the site of large RE suppliers.
iii. Small distributed storage solutions at households and other consumers which are programmed to provide support to the grid and power to the consumer when the grid is off-line.

The focus is on these projects in order to address the immediate need for storage to help transform the sector. The information accumulated during this pilot period will inform the pricing framework for the full rollout of the storage market which is part of the energy transformation.

In the BNEP, the GoB articulated its intention to move the island to a position where, by 2030, 100% of energy generated is RE. The goal of the energy transition includes, inter alia, the reduction of the island's dependency on fossil fuels and improved sustainability of the island's economic and social development. At the end of 2021, approximately 8%[2] of the island's electricity generation was derived from renewable energy.

One of the significant components required to achieve the 2030 goal outlined in the BNEP is the rapid deployment of RE generation to replace that from fossil fuels. The deployment of energy storage systems is critical to the national RE mandate and the sustainability and resilience of the national electricity grid, especially given the fact that solar PV, an intermittent RE source, appears to be the RE of choice in Barbados. Incorporating energy storage into the electricity grid is viewed, among other things, as the means of addressing the problem of demand and supply mismatch, and reduce the impact of intermittency related to RE on the grid. The establishment of a framework which facilitates investment inclusive of pricing as well as the buildout of energy

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[1] Ancillary services refers to functions that help grid operators maintain a reliable electricity system by maintaining the proper flow and direction of electricity, addressing imbalances between supply and demand, and helping the system recover after a power system event.
[2] Calculated from Audited Financial Statements year end December 31, 2021

storage is therefore required. Given the early stages of and the need for expedited development of the energy storage market to support the further advancement of the RE sector, a methodology is required to stimulate investment and growth in the short term.

There are two primary methods of catalysing the development of the energy storage market; competitive procurement and FITs. FITs are pricing mechanisms administratively set, guaranteeing a stable and predictable return on investment for a fixed period. An advantage of FITs is that they can generally be implemented within a shorter timeframe, thus incentivising investment in the sector. On the other hand, competitive procurement is the process where multiple suppliers compete to win a contract by submitting bids that meet the sector's requirements at the lowest cost. This mechanism provides significant benefits in a well-developed market, where data is more easily accessible, and analysis can be completed to determine the best options for the markets in question. However, competitive procurement may exclude smaller scaled investors, who cannot compete through economies of scale, from participating in the process. It may force compromises in the quality of service for entities to come in at the lowest possible price to win the bid.

FITs allow appropriate management, where the market determines rates realised by competitive procurement. FITs may be considered to be more favourable in the Barbadian context, given the vision of the BNEP to encourage involvement at all scales, as it promotes a levelled playing field for developers of all sizes to be engaged. This consultation paper seeks comments on the methodology to be used to determine the EST, whether a competitive procurement framework or a FIT methodology in order to encourage energy storage deployment at all scales. The Commission will determine the EST's structure and quantum, which is to be applied to grid-connected energy storage projects. The capacity of the pilot projects indicated in the initial tranche of the EST programme will be determined in consultation with the agency with the responsibility for energy (in this instance, the MEBD) and BLPC, as indicated in the BCESEP.

Under the FTCA and the URA of the Laws of Barbados, the Commission is required to consult with interested persons and stakeholders when discharging certain functions. Consequently, this public consultation will seek the views and opinions of renewable energy producers, representatives of consumer interest groups and other interested parties. In making its determination, the Commission will consider these contributions. Therefore, this paper solicits comments on the structure and quantum of tariffs for energy storage systems.

The consultation period will begin on **March 31, 2023** and end on **April 21, 2023**.

SECTION 1 CONSULTATION PROCESS

A thoughtful and deliberate approach is key to achieving a positive outcome and this begins here with this consultation paper as we solicit your input and feedback as crucial stakeholders. This consultative document includes specific topics and questions which may be responded to. Respondents may however address other aspects of the consultation which the Commission has not specifically addressed. Failure to address all topics will in no way reduce the consideration given to any response. An assessment of the submissions will be conducted and used to inform the Commission in its determination of the EST. The determined EST will be supported by the Commission's independent research and analysis of the submissions.

Responses to Consultation Paper

The Commission invites and encourages written responses from all interested parties including the BLPC, other licensed operators, Government ministries, NGOs, consumer representatives, consumers and businesses.

The consultation period will begin on **March 31, 2023**, and end on **April 21, 2023**, **at 4:00 p.m**. There will be **no extensions** of this consultation period. All written responses should be received by this deadline. The Commission is under no obligation to consider comments received after **4:00 p.m.** on **April 21, 2023**.

The Consultation Paper may be accessed on the Commission's website, http://www.ftc.gov.bb.

Respondents to the Consultation may submit responses in electronic format. Email responses should be forwarded to info@ftc.gov.bb, prepared as Microsoft Word documents and attached to an email cover letter.

Responses may also 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

Confidentiality

The Commission expects to receive responses from a wide cross section of stakeholders and believes that such responses received should be shared as widely as possible with all respondents. **Respondents should therefore ensure that they indicate clearly to the Commission any response or part of a response that they consider to contain confidential or proprietary information, marking it as such and including in an annex to the response.**

Analysis of Responses

Through its ultimate decision in this matter, the Commission will seek to explain the basis for its judgments and, where it deems appropriate, give the reasons why it agrees with certain opinions and disagrees with others. Instances may arise where analysis of new information presented to the Commission will cause it to modify its view stated in this paper. In the interests of transparency and accountability, the reasons for such modifications will be set out and, where the Commission disagrees with major responses or points that were commonly made it will, as far as it can, provide justification.

SECTION 2 BACKGROUND

"Energy security and affordability through diversity and collaboration: establishing and maintaining a sustainable energy sector for Barbados" is the vision guiding the BNEP. This vision directs the transformation of the energy sector to one that is cleaner and more sustainable, assisting in the transition from a petroleum-fueled economy to one powered by renewables by 2030. The BNEP requires all inhabitants and tourists to access reliable, safe, affordable, sustainable, innovative, and climate-friendly energy services. This vision's realisation depends on the sustained development and deployment of RE technologies, coupled with adequate supporting policies and frameworks.

Given the country's isolated grid and the need for continued development of RE, the BNEP asserts that energy storage is particularly pertinent to a small island like Barbados to reduce the effects of the intermittency of developed and accessible renewables like wind and solar.

The current power needs of Barbados are met by BLPC offering electricity generation, transmission and distribution. BLPC operates a total installed capacity of 264.1 MW[3] of conventional fossil fuels, energy storage and RE plant. BLPC owns a 10MW solar PV facility and a 5MW BESS. Additionally, as of December 2022, 74MW of solar PV capacity was sourced from distributed generators and IPPs[4].

There has been a determined effort to wean the nation off fossil fuels, to utilize renewable resources that are primarily local and accessible, and to promote sustainable energy habits, as envisioned in the BNEP.

However, the integration of excessive VRE resources[5] creates challenges with the overall grid operation, stability and sustainability. It is therefore necessary for Barbados to implement adequate mitigation measures to ensure the RE sector's growth. The exploitation of energy storage is recognised as the primary mitigation mechanism to address this issue.

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[3] BLPC Non-consolidated Financial Statement December 31, 2021 and takes into account the retirement of 13 MW gas turbine, GT02 in 2022.

[4] 'Report to the Fair Trading Commission for the Quarter ended December 31, 2022 – c. Report on Riders & Pilot Programmes'

[5] VRE resources are those with high intermittent generation and thus provide an intermittent supply, such as wind and solar PV.

In March 2022, the Cabinet approved the recommendation of a storage policy, the BCESEP, that supports the development of storage energy systems on the grid and the role of the Commission to set the rates required for their deployment. The Commission's legislative role in developing rates fairly and transparently is expanded and supported in Section 3 of this document. By exercising this authority, the Commission can help to create a more equitable investment environment for storage developers, which is essential for the long-term growth and development of the Barbados energy sector. The approved recommendations of the BCESEP guide the Commission. The approved recommendations falling under the Commission's remit include:

a. The development of FITs for energy storage grid services utilising the following pilot projects:
    iv. Centralised storage operated by the utility.
    v. Centralised storage operated by private storage suppliers.
    vi. Distributed storage at the site of large RE suppliers.
    vii. Distributed large storage provided as a stand-alone service but located at the site of a large RE system.
    viii. Small distributed storage solutions at households and other consumers which are programmed to provide support to the grid and power to the consumer when the grid is off-line.
    ix. Small distributed storage solutions from EV in a V2G function.
    x. A Virtual Power Plant to support the 50,000 households roof top PV policy.

b. The development of a tariff for a Virtual Power Plant.

The BCESEP seeks to maximise the system benefits of energy storage via long-term ratepayer cost reductions, increased grid resilience and maintaining grid reliability, and decreased greenhouse gas emissions.

A high influx of VRE technologies, with adequate and necessary mitigation mechanisms on the grid, can ensure the attainment of the BNEP and BCESEP goals.

Ensuring that the proper safeguards are put in place to guarantee grid stability, reliability and resilience will be crucial to the success of the clean energy transition. These safeguards can be achieved by using energy storage technologies providing the appropriate grid services necessary as mitigation measures. The advancement and deployment of energy storage systems will reduce the unpredictability of grid-tied RE technologies. Therefore, energy storage is critical for the RE sector's continued growth.

From its generation planning study, the August 2021 IRRP[6] for Barbados states that high granularity VRE production data should be continually and systematically gathered, monitored, stored, and analysed throughout the island. All power plants should record this along with information about the weather to measure and estimate RE yields and intermittency today and in the future. By adopting a cautious stance, the study demonstrates that the reserve dimensioning's[7] outcomes contribute to the BESS power capacity requirements (among other factors). Less uncertainty means lower risk to supply security and higher planning certainty. It also can optimize (and potentially reduce) the required BESS deployment and, as a result, investment, costs, and tariffs.

The IRRP also notes that additional strategies, such as electrical islanding and replacing OHLs, will help increase system resilience in the future, including the geographic distribution of generation, BESSs, and SCOs[8].

To meet the 2030 objectives, the BNEP, BCESEP and IRRP all promote a modernised grid with high levels of deployment of RE backed by adequate storage and other supporting infrastructure and frameworks.

The pilot projects as set out in the energy storage policy are listed above. However, this consultation seeks to address a subset of those projects, in this initial stage of the development of energy storage tariffs. The accumulation of verifiable information in this initial stage will provide guidance for the development of and expansion of rates for the complete list of pilots as noted in the policy. Those pilots covered at this stage are:

a. Centralised storage operated by private storage suppliers.
a. Distributed storage at the site of large RE suppliers.

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[6] The IRRP aims to determine the optimal combination of supply- and demand-side alternatives to reduce generation costs throughout the planning period (next ten years).
[7] Refers to the accurate sizing of the required reserves for the grid.
[8] SCOs generate or absorb reactive power to maintain the grid's steady current flow, ensuring that people who require reliable electricity have access to it when needed.

b. Small distributed storage solutions at households and other consumers which are programmed to provide support to the grid and power to the consumer when the grid is off-line.

This initial phase of the EST programme will be defined by:

- storage capacity, in consultation with the MEBD and the BLPC, guided by the IRRP;
- duration of the programme: currently 4 years is recommended;
- the three listed pilots above.

The questions posed in this consultation document apply separately to each of the three pilots listed above. Your responses may differ based on the pilot that is being addressed.

SECTION 3 LEGISLATIVE FRAMEWORK

The Commission's authority to set rates

The FTCA and the URA outline the Commission's general authority to set rates to be charged by service providers and renewable energy providers and also set out the considerations and principles that must be adhered to when determining the same. The URA, however, deals specifically with compensation for RE producers. Together, these pieces of legislation (which were both amended in 2020 to extend the functions of the Commission to include RE producers) provide the over-arching framework necessary to authorize the Commission to establish rates for energy storage, i.e., the EST.

Definitions

Section 2 of both the FTCA and the URA define "rates" as follows:

"" 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"*

The FTCA and the URA extend the definition of "renewable energy producer" to RE producers who also store electricity. Section 2 of the FTCA and section 24A of the URA both state that:

> *""renewable energy producer" includes a generator, distributor or person who **stores** and supplies electricity generated from a renewable energy resource for sale to the public grid"*

Authority to set rates for RE producers

Section 4 of the FTCA empowers the Commission to set and monitor rates to be charged by RE producers and states, inter alia, that:

> *"(1) The functions of the Commission are to enforce the Utilities Regulation Act…*
>
> *(2) The Commission shall carry out its functions in such a manner as to*
>
> *(a) promote efficiency and competitiveness amongst; and*
>
> *(b) improve the standards of service and quality of goods and services supplied by service providers, renewable energy producers and business enterprises over which it has jurisdiction*

(3) The Commission shall, in the performance of its functions and in pursuance of the objectives set out in subsections (1) and (2),

a) ***establish principles for arriving at the 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 producers; ...***

d) …."

Part I of the FTCA defines:

"Principles" mean the formula, methodology or framework for determining a rate for a utility service.

Energy storage and the Commission's authority to set rates for RE producers

Section 24B of the URA outlines the Commission's specific functions with respect to energy storage. Section 24B (4) states as follows:

"(4) The functions of the Commission, in relation to a renewable energy producer storing energy that is produced by its plant, are to:

a) ***set the maximum rates to be charged;*** *and*

b) establish guidelines for interconnection.

Section 24B (5) states:

"(5) In performing its functions under subsections (1) and (4), the Commission shall request a renewable energy producer 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 duty to consult

When determining all rates, the Commission is required to consult with interested parties in accordance with section 4(4) of the FTCA, which states:

"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."

<u>ELPA – Storage Licences</u>

Pursuant to section 3(1) of the ELPA, RE producers may only store energy to be supplied to the public grid upon obtaining approval for a storage licence.

Section 2 of the ELPA states that "*store*", in relation to electricity, means "*to operate a storage system*" while "*storage system*" is defined to mean "*a system, mechanism or device for the conversion of electricity into a form of energy which can be kept in reserve, the keeping of that energy and the subsequent reconversion of that energy into electrical energy in a controllable manner*"

The approval of storage licences, however, is not a function of the Commission and RE producers will be required to apply for approval from the Minister to whom responsibility for energy is assigned for a storage licence. Part I of the ELPA outlines the requirements for making an application for such a licence.

SECTION 4 - PRICING METHODOLOGIES FOR RENEWABLE ENERGY SOURCES

There are generally two (2) pricing regimes used in the development of RE markets, namely FITs and competitive procurement frameworks, each being predominantly applied to achieve specific objectives for the power sector.

FITs have been proven as an essential tool to increase RE penetration in the generation mix and as well as in its integration into existing power grids. The value of the FIT is a rate which must be paid by the off-taker, namely the utility, to the RE generator (seller), for each unit of kilowatt-hour (kWh) sold to the grid and is a guaranteed form of compensation over a fixed contract period, usually 15 – 25 years. Payments for energy purchases ($/kWh) are derived from a Levelised Cost of Energy (LCOE) methodology or the value of the energy to society.

Advantages:

- FITs spread the cost of mixed generation across all consumer classes;
- FITs encourage non-centralised deployment of RE generation;
- FITs may promote new industrial activity in areas where such tariffs are introduced; and
- FITs are simple to administer and facilitate a more secure domestic energy supply, allowing for continuous capacity expansion.

Disadvantages:

- As FITs have historically been designed as subsidies they impose a higher cost on energy consumers. Subsidies are not contemplated for the Barbados scenario.
- Information asymmetry on production and technology costs may result in regulators setting tariffs too high or low
- If set too high FITs may result in unjustified profits for investors.
- If set too low they will not encourage investment in RE technologies.
- If FITs are not set at a competitive level they are incompatible with competitive national electricity markets.

Competitive procurement, which is an alternative approach allows eligible market participants to submit their own energy prices (bids) in response to specified demand for new capacity in the power market. This approach can evolve in the form of a RPS which dictates the volume of RE capacity that is needed. RPS dictates to market participants how the demand for capacity is to be addressed. The outcome of an appraisal of bids for contracted capacity informs the awards of the winning bid.

Advantages:

- Establishes competitive pricing;
- Cost efficient;
- Offers investor security through long term PPAs;
- Effective volume and budget control tool;
- Well scheduled auctions can increase the predictability of RE- based electricity supply; and
- Facilitates the achievement of other policy objectives.

Disadvantages:

- Can lead to sporadic RE development
- Risk of underbidding
- Bidders incur initial high cost while there is a high risk of losing bid.

The thrust to develop a new energy storage market will require certainty of energy prices to sustain the market. Consideration to each pricing regime can be proven to be ideal in arriving at cost effective market rates.

SECTION 4 ENERGY STORAGE TARIFF

What is an EST?

An EST is a determined rate expressed in $/kW-month (in this instance) that a utility will pay to energy storage providers, for storage capacity and associated services[9], over a specified time. That payment is passed through to the customer from the utility. The EST is a valuable policy tool for supporting the advancement of a country's RE goals.

An EST will play a vital role in developing and deploying storage in the energy sector to support further RE integration. An EST as a rate, among other things, will promote energy independence, providing the advantages of improved supply security and stability, increased economic competitiveness, and environmental sustainability. An EST is reflective of the market conditions and requirements.

How does an EST work?

Using a FIT methodology, an EST considers the inputs, financial and operational, assesses the development costs within the determined parameters for a desired outcome, and outputs a rate that allows for recovery of investment and allowance of a reasonable rate of return. This rate is administratively determined. An EST can send targeted signals to the market, for example, incentives to the developers by implementing additional premiums or setting rates at the low end of the price spectrum to manage investment.

Rates determined using competitive procurement are derived where the storage capacity is acquired through an auction process following a call to tender by the agency managing it. The project owner provides a bid price that is based on its own specific business model and competes at the auction. That business model should take account of all of the project owner's input and operating costs, with an embedded desired rate of return.

Benefits of an EST

An EST provides numerous benefits for a country in its clean energy transition, specifically for the development of storage. It is usually employed to 'jumpstart' the niche market, however, the FIT methodology presents some challenges.

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[9] As listed 'auxiliary services' in subsection titled "Energy storage provides grid support" under "Benefits of an EST".

Benefits

Increased consumption of energy from RE sources can be achieved through a responsive market pricing structure for RE technology. The following net benefits of such an energy pricing plan can accrue to RE investors, electricity customers, the general public, and the environment.

❖ Energy storage facilitates the integration of renewable energy

One of the most significant benefits is that energy storage helps the grid integrate renewables, particularly variable ones. Therefore, given the direct link between the provision of energy storage and the advancement of RE deployment, energy storage shares the many benefits associated with RE, as secondary benefits.

These benefits include:

- **Reduced foreign exchange expenditure for fossil fuel purchases** - Barbados imports all the fossil fuels used to produce energy. Increases in RE storage and later use translate into decreases in fossil fuel consumption and imports.
- **Reduced greenhouse gases** - Reducing the use of fossil fuels for energy production can enhance air quality and increase the country's appeal as a green tourist destination.
- **Increased energy independence & security** – Storage tariffs support the increased adoption of RE systems and facilitates energy supply in periods of low production thus enhancing reliability. Utilising local RE resources increases energy independence since there is less reliance on external supplies.
- **Improved energy planning, reliability and resilience** - The utility is encouraged to upgrade or modify the existing grid to a smart grid to integrate a broad mix of RE sources, improving system efficiency, dependability, and durability.
- **Expanded green entrepreneurship/job offerings** - Compared to employment started by the traditional power business, the RE sector is the energy market's fastest expanding job creator globally. In 2021, the RE industry employed around 12.7 million people[10] directly and indirectly worldwide. This is also reflective in the local context, supported by RE programme offerings at the Barbados Community College, Samuel

[10] Irena – Renewable Energy and Jobs – Annual Review 2022.

Jackman Prescod Institution of Technology, and the University of the West Indies, Cave Hill campus.

- **Assist in shaping energy policy directives** - Tariffs established at the right level inspire confidence in the industry and spur development in the direction of the country's goals.

❖ Energy storage provides grid support

The grid benefits from energy storage in many other ways than merely the injection of RE. Energy storage can deliver the majority, if not all, of the numerous services required to maintain the functionality of our electric grid. The provision of these services makes energy storage vital to the reliability and resilience of the grid.

The energy storage auxiliary services provided are, inter alia;

- **Spinning reserve** – Needed to keep the grid stable during load fluctuations and emergency operating scenarios. As long as energy storage devices are in place, conventional generating can run at total capacity without storing power for emergencies. All of this increases the grid's efficiency.

- **Peak shaving with renewables** – When the grid uses energy storage, it can store electricity from RE during off-peak hours and release it during periods of high demand. The grid's efficiency is increased once more by not raising production during periods of high load.

- **Frequency response –** the maintenance of the system's frequency at about 50 hertz.

- **Solar Firming & Ramping** – This uses energy storage to offer a continuous power supply if there is a momentary disruption in the RE supply, like a cloud passing over a solar plant. The grid maintains a steady, reliable supply of power. This can be done grid wide or at the IPP.

- **Voltage regulation** – utilizing a utility signal or local voltage measurement to react to voltage variation.

- **Reactive Power Compensation** – responding to reactive power deviation with local measurement or with a signal from BLPC dispatch.

- **Distribution Hosting Capacity Control** - an autonomous service[11] supporting the grid by reducing the injected renewable power into the grid to reduce the thermal stress of the distribution feeders or to stop backflow from the distribution feeders into the transmission system.

❖ The benefits of an EST are enhanced through a FIT Programme

The primary advantage of a FIT programme is that it simulates development and therefore advances RE deployment. Whereas an EST facilitates development of needed storage to allow for RE integration, a FIT programme goes further by accelerating the progress by catalysing investment in RE. The combined effects of storage development through the EST and the FIT programme advances the BNEP's agenda.

Disadvantages of an EST

There are some drawbacks. The design of the EST, in particular, the underlying assumptions, may result in a lack of support from project developers and investors if the appropriate considerations are not factored in, thus causing market distortions.

Notwithstanding, the following list of common drawbacks of FIT programmes are universal.

❖ Information Asymmetry and Price Distortions

Regulators may experience information asymmetry on actual production or technological costs during the planning stage of a tariff programme. When the intention is to encourage investment, this might result in overly high pricing, leading to unduly significant customer expenses. Furthermore, rates that are set too high might give RE suppliers disproportionate and unjustifiable profits. One solution to this is the incorporation of decreasing price over time as the installed capacity increases. On the other hand, if the price is set too low, investors would have little opportunity to generate a respectable return. Where the price does not reflect the cost of the investment, this is a deterrent to new investment.

[11] Provision of services without complex utility software and communication systems to control the BESS.

- Higher Potential Energy Costs

  Historically, the development of tariff programmes utilised subsidies. In certain situations, the tariff is increased as a bonus to encourage investment resulting in higher energy expenses for the customer. The off-taker, often an electric utility, is forced to pay more than the market price for the energy from the RE source due to the premium put on the rate.

- Historically Unresponsive to Changing Market Conditions

  The length of a tariff contract is frequently designed to equal the number of years that make up the system's design life. It is impossible to forecast every possible change that can occur at the outset of the determination of a rate. When rates are set for a prolonged period, and any significant changes in the market occur that could be reflected in changes in electricity costs, they cannot be reflected in the tariff being charged. This may result in developer and investor confidence being eroded if they believe that the price that they earn for generation does not reflect existing market conditions. The possibility of the inclusion of a renegotiation clause can aid in addressing this disadvantage.

Developing an EST framework in Barbados

In its first instance, the proposed EST will provide recovery and a reasonable return for the recommended pilots identified to give the required grid support.

The proposed EST will benefit from lessons learnt through the pilot programme. These lessons help to reduce the effects of or mitigate some of the disadvantages mentioned above. Some lessons include the importance of having access to the GoB-facilitated portal, which expedites the application process for the sector. The Commission can also request information from IPPs for verification in the design and review process for the tariff.

In order to validate the cost effectiveness of the tariffs, the Commission ~~also~~ executes a customer impact assessment to determine the impact that the expected rates will have on the electricity price and resulting impact to the customer.
An EST will position Barbados to increase its RE deployment toward achieving the BNEP goals, given the current and expected impacts on the grid from increasing penetration of VRE.

SECTION 5 SPECIFIC PROPOSED CONSIDERATIONS

The power market in Barbados is remote and small. Therefore, the design components of any tariff programme must be appropriate for the local context. In order to guarantee that the tariff programme produces technically, financially, and ecologically sustainable outcomes, these design components should therefore strike a balance between the consumer's demands and the expectations of investors and the utility company.

The cost of energy storage has historically been high but has been falling recently. Over the last decade, the LCOS[12] has decreased significantly from approximately US $750/MWh in 2012 to about US $170/MWh in 2022. Similarly, BESS CAPEX costs are forecasted to decline in a logarithmic fashion from US $386/kWh in 2022 to US $234/kWh in 2030[13]. These reductions in costs imply that the LCOS will decrease over time. A high total CAPEX and operational costs for storage will result in a high LCOS, resulting in a high payment paid to the developer. Similarly, a downward shift of those costs will reduce the LCOS and capacity payment, benefiting the consumer. The total CAPEX and operational costs of storage are proportional to the expected payment. Therefore, the implied decrease in BESS CAPEX costs will decrease the payment to the developer, ultimately benefiting the consumer.

In light of the foregoing, the Commission proposes using an EST calculation tool to consider the project types, connections and services.

The rates are determined based on the Levelised Cost of Storage as determined using the equation below.

$$LCOS = \frac{Net\ Present\ Value\ of\ Total\ Capital\ and\ Operating\ Cost\ over\ lifetime}{Net\ Present\ Value\ of\ Net\ Electricity\ Discharged\ over\ lifetime}$$

Where the LCOS determines the $/MWh price.

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12 LCOS (Levelized Cost of Storage) is the ratio of the net present value of the total capital, operating and charging costs (as listed in part b of model inputs) of a storage project to the net present value of the net electricity discharged by the storage project over the lifetime of the project.

13 BloombergNEF – 2H 2022 Levelized Cost of Electricity Update. Accessed January 13, 2023. https://about.bnef.com/blog/2h-2022-levelized-cost-of-electricity-update/

The LCOS is calculated by considering the following parameters, specifically the components of the storage model and the components of the projects and financial costs listed below.

Input of parameters of storage model, inclusive of:

i. Lifetime of project (based on technology)
ii. Project type: grid-scale, commercial and industrial, or residential
iii. Connection type: front of meter or behind the meter
iv. Annual cycling (cycles/year)
v. Depth of discharge
vi. Capacity
vii. Rate of Equity
viii. Rate of Debt
ix. Equity/Debt ratio

b. Input of project & financial costs, inclusive of:
    i. Equipment
    ii. Engineering, procurement and construction
    iii. Development costs
    iv. Permits and interconnection fees
    v. Operating and maintenance
c. Calculation of LCOS – factoring in all parameter and input costs
    i. The LCOS is used to determination of initial Capacity price[14] as used in the PPA
    ii. The calculation of the LCOS also requires the Calculation of NPV, IRR and payback time
    iii. Setting of target IRR – the target IRR will be used to calculate the final capacity price
d. Calculation of PPA capacity price
e. Customer Impact Assessment

The making of the capacity payment will be determined by whether the energy storage system is categorised as 'used and useful'. Storage systems will be categorised as 'used and useful' provided their availability to provide three (3) or more storage power services[15] and two or more voltage/reactive power services[16] simultaneously or temporally and actively deliver these

[14] Refers to the capacity payment expressed in $/kW-month.
[15] As listed in Section 4.
[16] Ibid

services to the grid. Only systems categorised as 'used and useful' will receive the determined monthly tariff payments. Autonomous BESS services, as stipulated above, that do not need a utility signal will deem a BESS 'used and useful' without waiting for BLPC to provide a software dispatch layer for the storage.

The Commission will determine, in the first instance, the EST on a pilot basis for the specific projects[17] in keeping with the recommendations of the BCESEP. The pilot period will last four (4) years from the issuance of the EST. This period is expected to cover the design of the pilot projects through collaboration between the GoB and BLPC as recommended by the BCESEP, the development, procurement and deployment of the storage systems and an operational period of approximately two (2) years for data gathering. The pilot programme is expected to meet the grid's urgent needs by supporting a capped capacity to allow the additional deployment of VRE on the grid. Additionally, these pilots shall inform the Commission on how the various grid-supported services can be deployed optimally and ensure the determined EST is fit for purpose and adequate within the Barbadian context. The design and rollout of the pilot will be determined through collaboration between the MEBD and BLPC.

This consultation investigates the setting of an EST for technology-neutral[18] metered energy storage, independent of the size and location of the storage. It is expected that the tariff will be based on the LCOS that provides for the following features, which the Commission proposes to consider:

a. The minimisation of investor and financing risks to allow for low-risk debt financing and low risk returns on investment;
b. A degression schedule to reflect the declining cost of production over time and to incentivise innovation;
c. Inflation adjustments;
d. A time of delivery differentiator;
e. Bonus payments for community ownership;
f. Guaranteed 10-year ESTs; and
g. The broadest possible eligibility of all appropriate renewable energy technologies of all sizes and of all domestic investors to encourage democratisation of the energy landscape.

[17] Listed in Section 2 Background
[18] Recommended by the BNEP, BCESEP and 2021 IRRP

The aforementioned features are explained in greater detail below.

a. **The minimisation of investor and financing risks to allow for low-risk debt financing and low-risk returns on investment.**

The EST presents the opportunity to achieve steady and predictable cash flows. This acts as an incentive to investors when contemplating any significant project. With the help of this feature, the investor should be able to secure debt financing at appropriate rates for a low-risk business and make reasonable returns.

b. **A degression schedule to reflect the declining cost of production over time and to incentivise innovation**

The price of storage technologies has declined over time due to technological advancement, and this trend is projected to continue. A technique that takes into consideration these decreasing costs is a degression schedule. Between 2012 and 2022, the LCOS reduced by around 80%, reaching US $170/MWh[19]. The customer will benefit from the lower cost of the storage inputs based on a degression plan incorporated into the tariff structure. Additionally, it promotes the adoption of technological advancements and efficiency improvements.

c. **Inflation adjustments**

Changes in inflation rates will affect the ongoing expenses of an energy storage system, including operation and maintenance. Therefore, the rate should be price sensitive with the ability to represent the rate of inflation in the market. The tariff's structure should allow for price movement that tracks the inflation rate, meaning that when inflation increases, so will the tariff. Consideration could be given to the use of an inflation cap to limit the impact of high levels of inflation on the ratepayer. There is some protection for the investor's level of returns. Although the nominal price for the consumer is higher, in real terms, the price is unchanged.

d. **A time of delivery differentiator**

The tariff design may incorporate a facility that incentivises investors to supply storage capacity during times of greatest need. Rates may be differentiated according to the delivery of energy at peak and off-peak times.

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[19] BloombergNEF – 2H 2022 Levelized Cost of Electricity Update. Accessed January 13, 2023. https://about.bnef.com/blog/2h-2022-levelized-cost-of-electricity-update/

e. **Bonus payments for community ownership**

The tariff may be set up so that local community power producers, such as small neighbourhood organisations or associations, receive a premium. Small-scale business owners can gain from the industry in this way. This promotes the sector's democratisation. Additionally, capacity allocation to locals or community-based initiatives may be taken into account.

f. **Guaranteed 10-year energy storage tariffs**

FITs are generally set for long terms in line with the expected design life of the assets. Additionally, this feature provides a guarantee of stability to the investor.

g. **The broadest possible eligibility of all appropriate energy storage technologies of all sizes and of all domestic investors to encourage democratisation of the energy landscape**

The eligibility criteria determines which technologies are covered within the tariff structure. A small range of eligibility constrains the number of investors. Instead, the goal is to make it easier for a broader spectrum of investors to subscribe. By doing this, the financial return on the investment in resources is guaranteed for local players. Additionally, it encourages resilience.

SECTION 6 CONSULTATION QUESTIONS

The questions posed in this section apply separately to each of the three pilots proposed in this document: centralised storage operated by private storage suppliers, distributed storage at the site of large RE suppliers, and small distributed storage solutions at households. Your responses may differ based on the addressed pilot. Therefore, highlight which pilot segment you are referring to should your answer be specific to an individual one.

The BCESEP promotes a technology-neutral EST, i.e., no tariff differentiation based on technology. Tariff differentiation can impact a broad range of policy considerations, including policy costs, administrative complexity, economic development and diversity of the mix of services available to the grid. Another essential design component is tariff setting, where the quantum of the tariff may be set to incentivise energy storage development. Policy costs ought to be balanced with investor costs. Other general design considerations include:

- Specific services to be provided (i.e. ramping, peak shaving, etc.)
- Project type (i.e. storage alone vs hybrid)
- Duration requirement (i.e., 30 mins vs 4 hours)
- Average annual cycling requirement by service
- Capacity of technology to stack multiple services
- Technology application (i.e., grid-scale, residential, or commercial and industrial)
- Ownership structure (i.e., community-based vs privately owned)
- Location (i.e., to provide the required service for a specific feeder to allow further intermittent RE integration at that point)

The previous section outlined the various considerations that the Commission may include in its determination of the EST. This section outlines a number of questions or prompts for consultation that are related to, *inter alia*, the aforementioned proposed considerations.

1) **What do you think about the suitability of the considerations mentioned at Section 5 herein? What other considerations, if any, do you believe are imperative? How do you think these considerations should be reflected in the EST structure?**

2) **To audit the effectiveness of the rate for the pilot programme toward the development of future EST rates, kindly opine on the proposed pilot period.**

Financial Risks

Investors often seek dependable income streams and clear regulations on policy support. These objectives are made possible by ongoing technological development, the emergence of new investment markets, and the expansion of a broader range of socioeconomic strategic objectives that influence energy storage policy.

The Commission is responsible for ensuring that the rate is constructed in a way that provides a consistent, predictable, and sufficient income stream. In other words, a steady, predictable, and adequate income stream lowers the risk for lenders and encourages them to provide low interest rates to RE investors and suppliers. The primary tool for attaining the above would be the permitted rate of return on investment because the manufacturing and other procurement expenses are outside the control of the Commission. However, pilot projects are one way to identify risks, allowing investors to utilise risk mitigation measures to accept, avoid, control, transfer, or watch and monitor those risks. Pilot projects will enable the investors to address the risks, answer questions, and provide learning experiences, whether related to cost or process, in developing their projects, as some of those risks may remain unknown until they occur.

3) **To reduce the financial and economic risk to RE investors and consumers, what risk mitigation measures do you believe the EST must have? Describe how these measures will lower risk.**

4) **Indicate, with justification, if you agree or disagree that EST should include a compensation scheme for community-based energy storage initiatives. How should any EST or other system calculate and handle this?**

The Commission has created an EST calculator tool to calculate the LCOS for different energy storage technologies and project types. This tool will be used to develop tariffs, allowing for the changing of inputs and assumptions over time.

Energy storage systems can offer the grid various services[20], some of which are more critical than others. To maintain their reliability, particular grid components may need different combinations of services, while the overall grid needs a specific set of services. Due to the typical annual

[20] As listed in Section 4.

cycling, storage devices can each offer one service or a variety of them, each with a different effect on the specific storage system.

The usage of a capacity payment is more appropriate given the many combinations of services each storage system would be needed to offer, than to pay for individual services for variable lengths of time. The capacity payment will cover the defined capacity to provide particular services.

To enhance the learning curve of all the storage services[21], the BCESEP stressed the significance of launching pilot projects. These initiatives will weigh the advantages and disadvantages of integrating energy storage technology. To effectively evaluate ESTs for Barbados, such initiatives try to comprehend how storage may deliver stacked services when managed in grid operations.

5) **How should the pilot projects be rolled out to maximize the grid's benefits and the regulator's ability to comprehend how stacked services will operate in Barbados?**

6) **Considering the multitude of services that the energy storage asset can provide, comment on the use and appropriateness of overall capacity payments, instead of payments for individual services rendered.**

Tariff Design

The BNEP outlines the GoB's aim, which is to promote the decarbonising of the energy sector and the importance of investment in storage. A wide variety of domestic investors, from utility-size developers to individual homeowners, ought to be given the opportunity to profit financially from the tariff programme. Projects focused on RE in the local community could help with this. Implementing a reward system, such as incentive payments, can further incentivise such initiatives and investments at this level.

In an auction system, bidders are compelled to offer solutions that would enable the firm to remain sustainable while minimising expenses owing to the competitive nature of the process. A more recent model uses a mix of a FIT and a competitive bidding procedure, with the FIT rate serving as the maximum limit and the government or regulator taking into account offers that fall below it. This can result in downward pressure on the rate. Additionally, competitive

[21] As listed in Section 4.

procurement can further reduce the rate through competition. However, competitive procurement lends itself to larger projects with higher CAPEX where the competition can be absorbed through economies of scale. It is expected that both larger investors and consumers will see the greatest benefits from projects over 10MW being competitively procured owing to economies of scale.

7) **Given the potential benefit to investors and consumers of economies of scale, what are your views on the concept of using different tariff mechanisms for size categories in the future?**

How successfully the needs of the investor and the customer are addressed depends heavily on the cost of storage. In determining the EST, significant factors include considering the cost, how it fits into the overall energy balance, and its benefits. Investors require assurance that the resources they commit to an energy storage project, including their cash, will provide the expected return. Given that this is essential for attracting new and ongoing investment, the tariff system must deliver consistent returns over time that are sufficient to cover the investment.

8) **What kind of return should investors expect, in your opinion, and why?**

9) **Should there be varying rates of return associated with different degrees of risk for investors based on different energy storage technologies, the magnitude of the linked capital expenditure, the make-up of finance, or other factors? How should each case's assessment of this risk and the associated return on investment be made?**

Energy storage technologies all have varying lifespans and therefore may require varying durations of an EST to match the economic lifespans of the technology. Additionally, the economic lifespans of some technologies are dependent on the standards being applied to the systems and the corresponding resulting annual cycling. Notably, BESS typically have an economic lifespan of 10 years. However, that may shift in either direction depending on its use. Therefore, for a technology neutral approach, the Commission must consider how the EST economic period should be treated.

10) **Should the contract period[22] of the EST vary depending on the type of energy storage device, given the varied warrantied lifespans?**

11) **What are your views about the appropriate timeframe to recover the investment? Should this vary depending on the kind of energy storage device, given the varied economic lifespans?**

FITs are often created as long-term policy tools, providing investors with stability. The investor will be able to know upfront the many circumstances in which they can earn an expected rate of return with a guaranteed tariff structure over a specific term. Establishing the EST period to correspond with the asset's useful life is advisable because the rate included in the tariff is based on the LCOS. However, based on initial assumptions, future cost and condition estimates could be more problematic. Manufacturing prices may change over time due to several uncontrollable factors, including advancements in technology, changes in input costs and modifications to the tax code. As a result, it could be prudent to mandate regular tariff reviews.

12) **Should the EST be guaranteed for the full lifetime of the energy storage asset? Give justifications for your response.**

13) **Should the EST be evaluated on a regular basis to reflect the market's actual cost of storage? What time frame would be appropriate for a review?**

Degression schedules are typically key design components in FITs. A degression schedule accounts for decreasing manufacturing costs, primarily due to technical advancement. Using this approach, a rate structure is established that will change in response to these declining production costs, letting investors know that the tariff will decrease over time in tandem with production costs. Investors will be motivated to innovate and boost productivity to preserve or boost earnings over time. Consequently, consumer expenses are reduced. Similar to this, some tariffs are front-end loaded to enable investors to collect higher rates early on and lower rates later on in the project's life.

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[22] This refers to the determined duration for which the EST has been agreed to be paid for the availability of storage to provide auxiliary services to the grid.

14) **Should the EST design include a degression schedule over the energy storage assets' lifetime? Which periods should be used when applying the schedule? Justify your answers.**

In order that there is controlled rollout of the storage capacity on the electricity grid, consideration must be given to the tariff design as it relates to the rates for specific capacity bands. Additionally, capacity bands allow rates that are set administratively to take into consideration economies of scale, and facilitate any efficiencies thus gained to the ratepayer.

15) **What capacity bands do you consider to be appropriate and why?**

Project Design

RE installations can offer variable or fixed energy depending on the type of technology used. For instance, solar energy is a VRE resource since direct sunlight is intermittent; as a result, a solar PV system performs worse on overcast and wet days. The speed of the wind is also intermittent. These elements are unpredictable. VRE resources must be used at generation time unless a storage facility is already in place. Regardless of the IPP's production fluctuation, the utility must continue to meet its energy demand obligations. As was previously said, either the IPP or the utility provider can employ storage at specific points on the grid to alleviate the reliability issue in particular locations and grid wide.

The Commission considers whether an EST levy could be included as a specific line item on IPP's bills and charged to BLPC's consumers. Any "support or subsidy" sums that BLPC pays to energy storage providers under the EST over BLPC's tariffed retail rate paid to its customers would be collected through this EST levy. The "support or subsidy" amount, greater than the price of BLPC's energy supply, can be considered an incentive payment to energy storage companies. Energy storage companies will get some form of support or subsidy from BLPC, which will also have the option to recoup these costs from users through rate reviews. To facilitate simple monitoring and transparency, it must be considered if this should be stated explicitly on client invoices.

16) **Comment on how often any EST levy charged to customers should be amended and identify the factors that should trigger the EST levy changes. Should changes or updates to the EST levy occur when:**

a. **There are significant changes in the EST?**
b. **There is a significant increase in the number of energy storage providers and related volumes on which the EST is paid?**
c. **Energy storage providers impose significant costs or capital investment upon the BLPC network?**
d. **The EST levy increases by a certain significant dollar amount or percentage threshold (such that minimal changes do not require updates)?**
e. **There is a filing by BLPC for a variation in rate with necessary supporting documentation?**

17) Explain how the EST levy should be assessed to customers. Should it be tiered similar to the usage charge brackets charged by the utility?

<u>Grid development</u>

The grid's development and deployment of energy storage systems will require efficient dispatching and control, utilising remote signals from the utility. The grid operator ensures that both autonomous and utility-dispatched services are utilised effectively for maximum impact and reliability. Autonomous BESS services that do not need a utility signal will deem a BESS 'used and useful'[23] without waiting for BLPC to provide a software dispatch layer for the storage. This advantage will have higher resilience, and the storage devices can be accessed ahead of any signals that BLPC may eventually want to send to storage systems. This also ensures the utilisation of storage investments. The increased storage on the grid, both from the utility and private investors, necessitates a fair and robust mechanism to ensure all energy storage systems are utilised adequately without bias for one system over another. Therefore, a mix of autonomous and utility-controlled signals is ideal for the grid's growth.

18) Describe how the mechanism to handle the above situation should function. Should BLPC, owner of the grid, be the dispatcher or should there be a third party handling that function?

<u>Proposed EST</u>

The Commission suggests setting a tariff for metered storage to provide availability of capacity to the grid for autonomous or utility-dispatched services necessary for reliable grid operation. These services will be offered within the constraints of a storage technology's manufactured

[23] As defined in Section 5.

limits. It is anticipated that fixed capacity payments will be made to energy storage developers for the utility's usage of their capacity to deliver any combination of the aforementioned auxiliary services[24]. Whether the storage is paired with a PV system or operates independently, it will be metered to verify its performance, with periodic reconciliation or auditing. The determined EST will remain in effect for the duration of the contract period and is not impacted by any subsequent rates.

19) Describe any challenges the proposed option may present. Explain whether an alternative option would be more beneficial for the consumer and sector, while maintaining grid reliability in light of the stated limitations of the grid.

Tariff Methodology

One of the main challenges for the development of energy storage relates to the economic viability and the impact of the cost of storage on the end consumer as well as the operators. Specifically, the recovery of the cost of the assets through the use of an appropriate compensation scheme is an area that benefits from feedback of all stakeholders. In addition, business models may vary depending on where in the electricity system the storage is located, so that differing pilots may benefit from different tariff methodology.

20) Which methodology is appropriate for the determination of the EST, FIT or competitive procurement and why? Should the same methodology be applied to all of the pilots?

[24] As listed in Section 4 of document.

APPENDIX 1

SUMMARY OF CONSULTATION QUESTIONS

Following are the list of questions presented throughout this paper with respect to the issues or proposal identified. These question apply to each of the individual pilots as mentioned on page 4 of this document. In order to gain the greatest benefit from this consultation process, the Commission welcomes responses from all stakeholders.

1) **What do you think about the suitability of the considerations mentioned at Section 5 herein? What other considerations, if any, do you believe are imperative? How do you think these considerations should be reflected in the EST structure?**

2) **To audit the effectiveness of the rate for the pilot programme toward the development of future EST rates, kindly opine on the proposed pilot period.**

3) **To reduce the financial and economic risk to RE investors and consumers, what risk mitigation measures do you believe the EST should have? Describe how these measures will lower risk.**

4) **Indicate, with justification, if you agree or disagree that EST should include a compensation scheme for community-based energy storage initiatives. How should any EST or other system calculate and handle this?**

5) **How should the pilot projects be rolled out to maximize the grid's benefits and the regulator's ability to comprehend how stacked services will operate in Barbados?**

6) **Considering the multitude of services that the energy storage asset can provide, comment on the use and appropriateness of overall capacity payments, instead of payments for individual services rendered.**

7) **Given the potential benefit to investors and consumers of economies of scale, what are your views on the concept of using different tariff mechanisms for size categories in the future?**

8) **What kind of return should investors expect, in your opinion, and why?**

9) **Should there be varying rates of return associated with different degrees of risk for investors based on different energy storage technologies, the magnitude of the linked capital expenditure, the make-up of finance, or other factors? How should each case's assessment of this risk and the associated return on investment be made?**

10) **Should the contract period of the EST vary depending on the type of energy storage device, given the varied economic lifespans?**

11) **What are your views about the appropriate timeframe to recover the investment? Should this vary depending on the kind of energy storage device, given the varied economic lifespans?**

12) **Should the EST be guaranteed for the full lifetime of the energy storage asset? Give justifications for your response.**

13) **Should the EST be evaluated on a regular basis to reflect the market's actual cost of storage? What timeframe would be appropriate for a review?**

14) **Should the EST design include a degression schedule over the energy storage assets' lifetime? Which periods should be used when applying the schedule? Justify your answers.**

15) **What capacity bands do you consider to be appropriate and why?**

16) **Comment on how often any EST levy charged to customers should be amended and identify the factors that should trigger the EST levy changes. Should changes or updates to the EST levy occur when:**
    a. **There are significant changes in the EST?**
    b. **There is a significant increase in the number of energy storage providers and related volumes on which the EST is paid?**
    c. **Energy storage providers impose significant costs or capital investment upon the BLPC network?**
    d. **The EST levy increases by a certain significant dollar amount or percentage threshold (such that minimal changes do not require updates)?**
    e. **There is a filing by BLPC for a variation in rate with necessary supporting documentation?**

17) **Explain how the EST levy should be assessed to customers. Should it be tiered similar to the usage charge brackets charged by the utility?**

18) **Describe how the mechanism to handle the above situation would function. Should BLPC, owner of the grid, be the dispatcher or should there be a third party handling that function?**

19) **Describe any challenges the proposed option may present. Explain whether an alternative option would be more beneficial for the consumer and sector, while maintaining grid reliability in light of the stated limitations of the grid.**

20) **Which methodology is appropriate for the determination of the EST, FIT or competitive procurement and why? Should the same methodology be applied to all of the pilots?**