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Utility Regulation and Competition Office

11/9/20

REPORT OF THE TECHNICAL COMMITTEE

Constituted to Review the Proposed New Tariff for the Proposed 1 MW of Capacity to be Transferred from the Distributed Energy Resources Programme to the Customer-Owned Renewable Energy Programme and to make Recommendations

November 9, 2020

Report of the Technical Committee constituted to

Executive summary

After having received direct representation from the Cayman Renewable Energy Association's (CREA) President Mr. James Whittaker at a Special Board Meeting convened on September 16, 2020 specifically for this purpose, the OfReg Board at its general meeting held on September 24, 2020 approved a motion as follows:

Whereas the Board received direct representation from the local renewable energy association regarding its recent decision on CORE rates; and whereas the Board is legally mandated to execute Government policy (in this instance the National Energy Policy); and Whereas the Board continues to promote transparency and inclusivity in its decisions; Be it resolved that the Board instructs the CEO to form a technical committee with the purpose of:

(a) confirming the calculation for the grid capacity regarding non-firm renewables;
(b) ensuring that all relevant factors were considered and included in arriving at the rate of 13.4 cents per kWh;

Factors to be considered in relation to (b) above shall include but not be limited to:

(a) An appropriate consideration and weighting for the goals of the NEP;
(b) Promotion of innovation within the local industry;
(c) Broad outcome 2 "Achieving Full Employment – Jobs for All Caymanians"; and
(d) The economic viability of the local renewable industry.

The Committee shall provide an appropriate forum to ensure representation from the renewable energy sector and other relevant stakeholders, and shall report to the Board at its next meeting with advice:

(a) Confirming the rate of 13.4 cents per kWh; or
(b) Recommending a revised rate for the CORE programme; and
(c) On the potential for an increase in the amount of non-firm power on the local power grid which could be released to the CORE programme.

Hence, in order to execute the Terms of Reference (TORs) of the motion, a Technical Committee was constituted by OfReg's CEO with the following members:

(i) Gregg Anderson, EDEU	Chairman
(ii) Louis Boucher, DDEU	Member
(iii) Charles Farrington, Chair, Energy Policy Council	Member
(iv) Ministry Commerce, Planning and Infrastructure (CPI) Representative	Member

(v) Andrew A. Rollins, Business Consultant (former CFO of SOL and CORE customer)	Member
(vi) Andrew Small, Dart Enterprises	Member
(vii) Sacha Tibbetts, VP Customer Service, CUC	Member
(viii) James Whittaker, President CREA	Member

The Chairman suggested that the committee should have only seven members and that composition of the SPAC should be changed to include:

a) An independent (Non CREA) representative of the local solar industry;
b) A member from the private or public sector with financial literacy and expertise in finance/accounting or utilities economic regulation; and
c) A member from the private sector or public sector with relevant knowledge and experience in the energy sector including consumer interests, environmental aspects and interconnected operations.

This change was recommended to ensure that since two committee members had a direct interest they should not be participating in the deliberations or voting on the particular matter(s). Also since three members were already respondents to the Draft Determination, opinions from other non-respondents would provide a more diverse and objective evaluation of the Draft Determination decision. However this recommendation was not followed. There was also no Non-CORE member of the committee and it would have been crucial to the decision-making process to have included his/her feedback on the Draft Determination decision. The Chairman invited Dr. Ted Kury (an Economist), from the Public Utility Research Centre (PURC) of the University of Florida in Gainesville to join the committee. Dr. Kury accepted the invitation in a personal capacity, but was unable to attend the meetings.

Nevertheless, the SPAC held its first meeting on October 14, 2020.

(i) Gregg Anderson, EDEU	Chairman
(ii) Louis Boucher, DDEU	Member
(iii) Charles Farrington, Chair, Energy Policy Council	Member
(iv) Kristen Augustine, Energy Policy Co-Ordinator	Member
(v) Andrew A. Rollins, Business Consultant (former CFO of SOL and CORE customer)	Member
(vi) Andrew Small, Dart Enterprises	Member
(vii) Sacha Tibbetts, VP Customer Service, CUC	Member
(viii) James Whittaker, President CREA	Member
(ix) Malike Cummins, CEO OfReg	

The discussions entailed the following:

a) Doubt about whether the Levelised Cost of Energy (LCOE) could be used to set the tariff and a request for a view of the methodology used for derivation of the proposed rate;
b) Concerns about the legal uncertainty of selling non-existent capacity per CREA's proposal;
c) Request for data on the cost impact of the subsidy paid by non-CORE customers to CORE customers; and
d) Factoring of the economic benefits produced by CORE customers.

The Chairman committed to providing members with the requested information prior to the next meeting which was scheduled for October 19, 2020. Copies of the OfReg Draft Determination, the PACE IRP, the CUC Infusion Study, Hawaiian Electric CORE rates, and the rate setting methodology were subsequently emailed to members.

CREA also submitted documents including a US Government National Renewable Energy Laboratory (NREL) report that presented its position on why the proposed $0.134/kWh was not a feasible rate for the local solar systems providers' financial well-being/survivability. Some of these documents had been already presented to the Board at its special meeting of September 16, 2020.

CUC also provided information on the quantum of the present, contracted and future considered levels of the CORE subsidy.

The SPAC held its second meeting on October 19, 2020.

Attendees were:

(i) Gregg Anderson, EDEU	Chairman
(ii) Louis Boucher, DDEU	Member
(iii) Malike Cummins, CEO OfReg	
(iv) Charles Farrington, Chair, Energy Policy Council	Member
(v) Tristan Hydes, Deputy Chief Officer, Ministry Commerce, Planning and Infrastructure (CPI) Representative	Member
(vi) Andrew A. Rollins, Business Consultant (former CFO of SOL and CORE customer)	Member
(vii)Andrew Small, Dart Enterprises	Member
(viii) Sacha Tibbetts, VP Customer Service, CUC	Member
(ix) James Whittaker, President CREA	Member
(x) Roy Taylor, RMI representative (at invitation of CEO)	Observer

The discussions entailed the following:

a) The IRP's assumptions and methodology;
b) The NEPs statement of what the rate should include;

c) How the country would achieve the goal of achieving 70% without subsidy;
d) How the OfReg proposed rate of 13.4 cents/kWh was determined; and
e) The possibility of hiring an external consultant to value the benefits of DG Solar.

The committee did not confirm OfReg's proposed rate of KYD$0.134/kWh and a majority voted to reject it and establish a new CORE rate of KYD$0.22/kWh as proposed by CREA. However, this latter rate has had no professional independent analysis of its derivation or verification of the benefits to be derived therefrom.

Another Infusion study will have to be conducted to determine the optimum amount of non-firm power that could be added to the grid whilst operating CUC's diesel plant at the most efficient level and also without having significant impact on fuel usage which is a direct pass-through to consumers.

The review process

As part of its business, the OfReg's Board of Directors requested that a Technical Committee (TC) be formed to review of the Solar Feed-in-Tariff (FiT) rate of KYD$0.134/kWh proposed in the E&U 2020 – 2 - Draft Determination Proposed Renewable Energy Capacity Reallocation and Tariff Setting. The objectives were to ensure that customers that have installed solar Photovoltaic (PV) systems are suitably rewarded and that the proposed rate took into consideration the Government's National Energy Policy (NEP) objectives regarding the establishment of a local solar industry.

The Review has been conducted by a Special Ad-hoc Committee (SPAC) established for the purpose mentioned in the Terms of Reference (TORs).

This Report are the findings of the Committee.

Background

A Feed-in Tariff (FiT) is paid to customers for the energy they export to the grid. The amount paid is based on a rate per kWh exported and can be applied to exports from distributed generation, including that from wind generation as well as from rooftop solar.

National policy context

The Cayman Islands NEP adopted in 2017 states inter alia in Goals 3 and 4:

1. 3.3.1.1 "*Ensure that promotion of the social, environmental and economic benefits of renewable energy takes into account the cost of energy to the jurisdiction, while achieving established standards in safety, reliability, power quality and a prudent diversification of the generation portfolio.*"….
2. 3.3.1.11 "*Promote grid-connected consumer owned renewable energy programmes in Grand Cayman, Cayman Brac and Little Cayman in a framework which provides*:"
   a) Rates reflective of the full costs and benefits of distributed renewable energy including economic, social and environmental costs and benefits.
   b) ….
   c) …..
   d) Reasonable limits to the individual and overall eligible systems having regard to economic and technical considerations that may evolve over time….

3. 3.4.1 Electricity Sector Strategy: "*Maintain planning and permitting processes for renewable energy development which are transparent, objective and facilitate transforming electricity generation primarily to renewable energy sources."*
4. 3.4.1.1 *Develop a renewable energy transition focused on the protection and choice of Cayman's consumers.*

Current arrangements

The Electricity Supply Regulation Law (2019 Revision) ("ESR" Law), Section 9. (2) (b) sets out the requirement for OfReg "*to review and approve other rates offered by T&D licensees outside of the respective RCAM and available at the option of the consumer;*" and Section 9. (2) (c) requires OfReg "*to monitor and regulate the rate, price, terms and conditions of electricity generated by Generators and supplied to T&D licensees for reward.*" It does not establish a methodology for OfReg to determine the FiT rate for solar customers and what must be considered as part of the rate setting process.

There are two FiT rates that were set in February 2019 that are currently available to residential Caymanian electricity customers:

1. $0.28/kWh Up to 5kW systems; and
2. $0.24/kWh From 5kW – 10kW systems

The current FiT rates are not based on any empirical information or economic value add methodology, and was set by OfReg's Board in 2019.

Solar in Cayman

As at the end of October 1, 2020, there were 541 CORE customers in Grand Cayman which were eligible to receive the Feed-in-Tariff rate. Of these around 402 are on the current rate.

Since the CORE programme was introduced in February 2011, Non-CORE customers have been subsidising CORE customers.

CUC provided the following information on the CORE subsidy:
The current CORE subsidy based on today's costs of energy which is presently CI$0.100717/kWh including fuel, duty and purchased alternative energy. For reference purposes, the cost of energy (fuel, duty and purchased RE) billed by CUC for the last 36 months has been an average of CI$0.127 cents. Based on the current fuel price the present subsidies are shown below.

Connected CORE systems:	CI$2,240,600/year
CORE systems under construction:	CI$589,900/year
Total Contracted CORE:	**CI$2,830,500/year**

Considering the remaining portfolio of approximately 1MW and an average output of 1660kWh per year for each kW of CORE capacity, the annual subsidy would rise by a further $56,440 with a CORE rate of $0.134/kWh. On the contrary, with CREA's proposed rate of $0.22/kWh, the annual subsidy would be $199,200 for this tranche of CORE resulting in a total annual subsidy paid by electricity consumers to just over CI$3 Million.

CREA provided data showing that just 3 of the 10 existing members, whose accounts are done by accounting professionals, contribute approximately CI$5M per year into the local economy, which translates to CI$125M over 25 years assuming no growth and noting its only a partial accounting of the full benefits from all CREA members. Thus CORE is pivotal to providing jobs and a net economic benefit to the country over and above the cost of the subsidy. CREA stated that it continues to invite OfReg, Government and/or any 3rd party consultants to verify and quantify the data to show the 'value' of distributed generation to the country, as they have been requesting from the ERA since 2016.

In regard to network arrangements, network costs are largely driven by maximum demand on the network, solar PV rarely generates much electricity at peak times which CUC mentioned occurs at 7:45 p.m., meaning solar customers place as much load on the network as other users.

Review of previous reports

As part of the Office's regulatory proceedings it issued a consultation paper on 20 April 2020 titled E&U 2020 – 2 – Consultation on the proposed Renewable Energy Capacity Reallocation and Tariff Setting. After allowing for cross-submissions by respondents, the Office in a Draft Determination, proposed a new rate of KYD$0.134/kWh that would apply for the FiT capacity of 1 MW transferred from the DER programme to the CORE programme.

The Board approved Draft Determination proposed that:

- A new FiT of KYD$0.134/kWh would apply for the 1 MW of capacity that would be transferred from the DER programme to the CORE programme.

The CEO communicated this to the Ministry of CPI and CREA and as a result the President of CREA requested and was afforded direct representation to OfReg's Board opposing the proposed new FiT rate. The Office also received correspondence from the Chief Officer of the Ministry CPI expressing his disappointment with the new rate.

The following reports were submitted for the Committee to review:

- The CUC Infusion Study;

- The Integrated Resource Plan (IRP);
- The OfReg Draft Determination;
- Documents submitted by CREA some of which were previously presented to OfReg's Board of Directors; and
- CUC submitted its calculation of present, contracted and potential future CORE subsidies.

Arrangements in other jurisdictions

Appendix 2 outlines the current FiT rates for residential customers in Hawaii and Malta. These two jurisdictions have a regulated minimum FiT rate.

Feed-in tariffs should be set at Avoided Cost Rate Calculation i.e. Verification of OfReg's proposed KYD$0.134/kWh?

Discussion

A key argument common to solar advocates is that solar PV generation allows for increased energy production and other economic and social benefits and that the value accruing from these other benefits should be reflected and priced into the FiT. Members reviewed the IRP projections in Exhibits 26, 41, 59 and 60 to see how OfReg arrived at the proposed rate.

CREA argued that the other benefits should be accounted for and that the proposed new FiT rate of KYD$0.134/kWh did not take these benefits into consideration. CREA does not support the new rate for this reason. CREA also stated that the historical average reduction in the FiT by OfReg was KYD$0.02/kWh. However, this is incorrect as there has been an increase in the rate and also reductions of KYD$0.08 and KYD$0.06 in the rates since their introduction.

Charles Farrington argued that OfReg's proposal is an abrupt reversal of approaches – from a substantial subsidy to none, but doesn't think that it is unreasonable to incline towards consumers in this circumstance. He also suggested that consideration be given to the current economic landscape and also the impact an abrupt change in the rate would have on market participants.

CUC argued that since the OfReg proposed rate is in line with what Hawaiian Electric is using for CORE systems and previous statements from CREA of 12 cents being viable (*CREA clarified that 12 cents was for large scale commercial systems under a possible DG Auction scheme and NOT small residential CORE systems*), the proposed KYD$0.134/kWh rate is close to what should be used for the approximately 1MW of remaining RE capacity.

CUC also suggested that OfReg should consider whether it is necessary to have a split of the 1MW between DER and CORE programmes, and perhaps allow both programmes to take from the quota on a first come first served basis.

CUC also argues that any FiT that pays customers in excess of the market value of the energy their system produces rewards CORE customers at the expense of other customers, either through higher prices or lower revenues to Government from CUC.

OfReg argued that the proposed new rate is derived from Portfolio 5 of the PACE IRP 2020 projections for both the avoided cost of fuel and the LCOE plus a small subsidy. CORE rates have previously focused only on systems' costs and providing a return to their owners. One direct and clear benefit is the avoided cost of energy from other generation sources which also has socio-economic and environmental benefits. Hence, OfReg has proposed a rate that

Portfolio 5 of the IRP calculates what that avoided cost might be as well as a component for socio-economic and environmental benefits. In considering the foregoing, OfReg has proposed a rate that is more congruent to the consumer benefits of the CORE programme that also includes a subsidy (See methodology in Appendix 3.)

Moreover, OfReg argued that its proposal is not an abrupt reversal of approaches – from a substantial subsidy to none as there is also a subsidy component in the proposed new rate. OfReg's research of other regulators' approach to setting FiTs indicates a leaning towards the consumers in either reducing or completely eliminating subsidies.

It is noted that other jurisdictions (e.g. some US states, California, Maine and also British Columbia, Canada), use the Avoided Costs (AC) method in calculating a solar FiT rate.

The discussion entailed the PACE IRP Portfolio 5 which indicated how the avoided costs and levelised cost projections were derived, but did not evaluate the validity of OfReg's 13.4¢/kWh calculation and focused more on trying to disprove its applicability for new CORE systems.

Feed-in tariffs should be set above the Avoided Costs of Fuel i.e. at CREA's proposed KYD$0.22/kWh?

Discussion

Charles Farrington opined that the committee should attempt to consider all the relevant information and try and reach a reasonable result even if it is not supported by some empirical data.

CREA argued that this rate is necessary to attract and continue customers' participation in the programme and sustain the local solar industry. The major element of CREA's calculations in relation to a proposed higher FiT (CORE) rate is their stated costs of the system and an approximate 15% return on investment. This rate does not explain the benefits to be derived from it.

CUC also made the latter observation and argued that if the FiT rate were to be set at KYD$0.22/kWh it would be a step in the wrong direction as it could obtain energy more cheaply from other utility-scale RE sources. In addition the rate would impose a continuing subsidy on Non-CORE consumers. CUC therefore does not support any rate that is not based on avoided costs or CREA's proposed rate of KYD$0.22/kWh. CUC maintains that any such excess should be justified by quantifiable benefits brought about by CORE systems to the customers paying the excess/subsidy.

Andrew Small stated that reducing the CORE rate from $0.24/kWH to $0.134/kWh would come as a price shock to renewable vendors and could possibly hinder progress in the industry instead of supporting its growth. Andrew also recognised that the $0.22/kWh proposed by CREA was not independently verified and therefore suggested that the rate remain at $0.24/kWh and be reduced to $0.134/kWh after a period of 5 years. However, members did not support this idea.

Andrew Rollins queried if the $0.134/kWh rate was attractive enough to encourage consumers to switch from diesel to solar PV systems.

Tristan Hydes stated that Ministry CPI supports the notion that Non-CORE consumers should subsidise CORE customers because of the benefits the latter produce. He proposed that Ministry CPI ask Cabinet for up to KYD$200,000 to replace the annual subsidy being paid by Non-CORE consumers.

OfReg argued that the solar FiT rate should be set equal to the PACE IRP projected rate for 2020 plus a small subsidy. Also that the committee needs to look at the net benefits of Distributed Generation (DG) Solar as there are considerable administrative costs for both CUC and OfReg to administrate the CORE programme which also puts upward pressure on CUC base rates.

Is a high FiT rate, short payback period and high return on investment needed to drive further investment in Solar?

Discussion

Charles Farrington suggested that CREA educate consumers that payback was not the only metric they should consider when buying a solar PV system. Since CORE customers have limited risk cash flows for 25 years, the Internal Rate of Return (IRR) is a better aid in decision-making about solar PV systems purchases. IRR's for 10% are considered exemplary and very attractive to investors. He also opines that the 15% ROI is too rich given current economic conditions. For example, yields on single B US corporate bonds (high yield bonds) are currently around 5.5% so there would appear to be strong grounds to look closely at a ROI of 15%. He also suggested that that one means of reconciling the conflict between meeting the market's purportedly desired investment recovery period (8 years plus or minus) and the need to limit the negative impact on all consumers is to have a two-tiered rate which reduces after the first say 8 years.

CREA argued that a continuation of a 'premium' FiT rate was needed in order for customers to recoup their investment costs of installing solar systems. CREA posited that an average payback period of 8 years was necessary otherwise installing a solar PV system was not bankable. CREA also argued that Cayman's cost of installing solar systems (KYD$2.71/Watt) was lower than that in the USA (KYD$3.32/Watt), based on data derived from the NREL Q1/Q2 Solar Industry Update. However, the NREL estimated costs are taken from only 4 out of the 50 US states.

CUC argued that CREA's proposed rate generates approximately a 15% ROI and that given the current and future economic conditions a guaranteed 15% ROI for 25 years is contrary to what is the norm now. Also that the gap between the two proposals could only be justified by a demonstrable customer benefit for paying the premium. Moreover since there is no qualified independent valuation of the CREA proposed premium any rate over avoided cost would be arbitrarily chosen with respect to the benefits. CUC opines that this is arguably an incorrect way to set rates.

Tristan Hydes acknowledged that it is unfeasible to determine the benefits of the CORE programme for this 1 MW or less tranche and posited that it could be done for future tranches of capacity.

Andrew Small argued that a 15% ROI could be considered too high and that a more reasonable rate of return should be considered. He also agreed that a two-tier rate mechanism is a potential solution.

OfReg argued that payback periods of 10 – 12 years was bankable, and data has shown that 10 – 12 years was considered acceptable in some US states and elsewhere. Also that local Class "A" banks were unconcerned about the payback period once customers had sufficient headroom in their mortgages to pay for solar PV systems. OfReg also argues that a guaranteed 15% ROI for 25 years is excessive and is significantly higher than the average 8.25% that OfReg has found in other jurisdictions and also that an average of 8% ROI is considered acceptable by most investors. Furthermore, OfReg considers that the IRR is a better method to use to compare the return on an investment in solar with the returns of other popular ways to

invest. Also that the IRR on a 22 cent/kWh CORE rate is too high when compared to historical CUC returns of 7-8%.

Irrespective of a general decrease in generous FiT rates, the decreased costs of solar systems has continued to provide sufficient incentive to ensure that the installation rates have not declined. On the contrary, installation have increased (Figure 1 below refers).

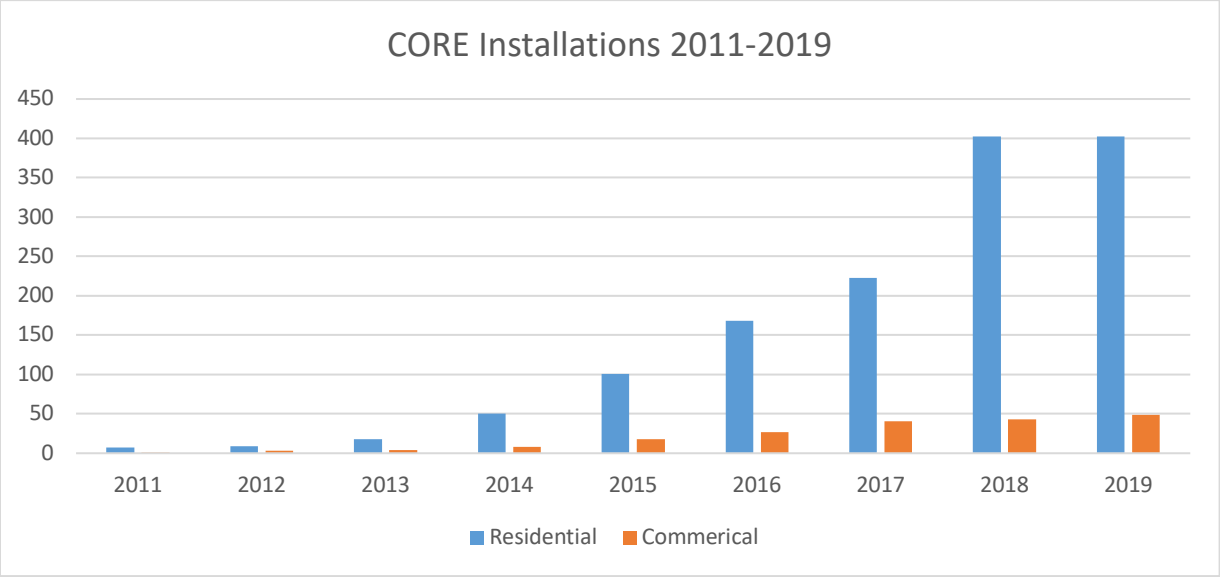

Figure 1 History of CORE Systems Installations

The Committee notes the continuing growth in solar installation by Caymanian households over the past five years despite a decrease in the 'premium' FiT rates.

Determination of Economic and 'Other' Benefits

Discussion

Charles Farrington agreed that professional economic analysis is required to by a third party economist to determine the economic value add of solar PV systems. He also stated that there should be some evaluation of the cost of loss of industry jobs versus the increase in energy costs to consumers.

CREA argued that the FiT rate should reflect the NEP's 3.3.1.11 a) objective and that the benefits of the CORE programme in terms of economic activity in jobs creation and other benefits should also be considered.

CUC argued that analysis by appropriately qualified independent professionals should be done to quantitatively support any premium that is to be included above the avoided cost rate.

Andrew Small agreed that independent professional economic analysis is necessary to determine the other benefits provided by solar PV systems.

OfReg argued that regulators arrive at different rates for renewable energy systems and avoided cost of generation is widely used, but trying to quantify the benefits derived requires professional economic analysis that shows what those benefits are, and independent verification of that information is essential to fair and equitable rate setting.

Currently there is a lack of information to determine the local value of solar. Roy Taylor, RMI stated that there is no methodology that can be exported to the Cayman Islands confirmed that objective valuation of the benefits from solar PV systems is difficult and various methods exist for doing this. Roy Taylor also advised that usually regulators start with an avoided cost method and subsequently refine it to try and capture the socio-economic benefits. RMI is available to assist with this matter if necessary.

The Committee opines that expert economic advice should be sought to determine the gross economic impact of solar PV systems to enable this component to be included in setting tariffs.

Summary of findings

Based on the information available, the Committee has reached the following conclusions:

1. Under the CORE programme FiT customers received a 'premium' value for their exported electricity. This provides the maximum benefit to the CORE consumer by offsetting their full retail cost of electricity from the network and producing extra income that is subsidised by the Non-CORE consumers.
2. The 9 MW CORE capacity allocation was established by the Infusion Study and was publicly announced.

Therefore the Committee notes that when PV systems sales utilised all the available capacity it would effectively cap/close the CORE programme until new capacity became available and that solar systems vendors should have been fully aware that there are capacity limitations.

3. Data shows that the reductions in the FiT rate has not reduced the uptake of solar and the industry has continued to perform.

Therefore the Committee notes that the number of solar installations is continuing to grow even with the previously reduced tariff.

Members agreed that Section 3.3.1.11 a) of the NEP which is quoted below is apparently the relevant part of the policy for setting the rate for CORE systems.

3.3.1.11 Promote grid-connected consumer owned renewable energy programmes in Grand Cayman, Cayman Brac and Little Cayman in a framework which provides:

a) Rates reflective of the full costs and benefits of distributed renewable energy including economic, social and environmental costs and benefits.
b) An appropriate billing mechanism.
c) A simple and safe interconnection arrangement through a standard agreement and for a reasonable term.
d) Reasonable limits to the individual and overall eligible systems having regard to economic and technical considerations that may evolve over time.
e) The ability to review and reset programmes appropriately, having regard to technology advances, system capacity considerations and other economic and technical factors.

The challenge with trying to set a rate per section 3.3.1.11 a), is that there is no current valuation of the 'full costs and benefits' of distributed generation including economic, technical, social and environmental costs and benefits. Therefore, until these full benefits are calculated/known, the rate setting methodology will in most circumstances, be the avoided costs of energy plus some subsidy.

Bridging the gap between CREA's and OfReg's proposed rates requires a justification that there is discernible consumer benefit for paying the premium CORE rate that CREA is proposing. With there being no analysis by appropriately qualified independent professionals available to quantitatively support this premium, any rate greater than avoided cost would be approximate with respect to the benefits. This is perhaps an incorrect way to set rates.

DECISIONS OF THE COMMITTEE:
The committee continued discussing potential alternative rates and rate structures, and without any objective economic analysis or empirical information to verify the benefits of DG Solar, the committee decided to vote on the following rate options:

1. Acceptance of the OfReg proposed KYD $0.134/kWh new rate; or
2. Supporting the proposed CREA rate of KYD$0.22/kWh even though there is no independent professional verification of CREA's data.

The results of the votes are as follows:
1. 3 (GA, LB and ST) in favour; 5 (CF, TH, AS, AR, and JW) not in favour;
2. 5 (CF, TH, AS, AR, and JW) in favour; 3 (GA, LB and ST) not in favour.

LB stated that he found it odd that persons voted against option 1 due to a lack of economic assessment on the benefits of DG Solar yet voted for option 2 without there being any economic assessment to justify the CREA proposed rate.

The committee did not directly address the potential for an increase in the amount of non-firm power on the local power grid which could be released to the CORE programme. However, CF requested that a new study be done on the costs of operating CUC's diesel engines at a lower efficiency to see if more capacity could be made available to the CORE programme prior to CUC's Battery Energy Storage System (BESS) implementation, This study should be combined with the overall evaluation of the full costs and benefits of solar to arrive at a CORE tariff that is supported by rigorous analysis. However, OfReg stated that this would also require other in-depth studies that would impose additional costs on OfReg, CUC and ultimately consumers, and would take considerable time to complete.

Conclusion

The new rate of KYD$0.22/kWh proposed by the Committee has not been professionally independently verified and is based on CREA's system costs and expected ROI by their customers. Independent professional economic analysis is required to determine the local value add of solar rooftop PV systems. The proposed rate will mean that Non-CORE consumers will continue to subsidise CORE customers. Additionally, the ROI of approximately 15% earned by CORE customers at the KYD$0.22/kWh rate is considered overly-generous compared to other industry norms of 7% – 8%.

Potential Actions for Consideration by the Board

To ensure that those that have installed solar are suitably rewarded and to incentivise further installation of solar PV systems in Cayman, the Committee presents the following potential actions for consideration by OfReg's Board. It should be noted that the socio-economic value of solar and other studies will require funding to implement and it is noted that no budget funding is currently available from OfReg.

Action 1: Adoption of a new CORE rate of KYD$0.22/kWh

Accept the CREA proposed rate of KYD$0.22/kWh as favoured by the majority of the committee members for this 1 MW or less tranche of RE capacity. It should be noted that this rate did not undergo independent professional economic analysis and would incur an annual subsidy of $199,200 by Non-CORE customers. In addition, such acceptance would circumvent the consultation process that is currently underway.

Action 2: Commission an Independent Economic Study to determine the Economic Value of Solar (VoS)

Currently, there is no local independent economic study available to determine the value of solar (VoS) that would enable the setting of rates as stated in Section 3.3.1.11 a) of the NEP which states inter alia: “a) Rates reflective of the full costs and benefits of distributed renewable energy including economic, social and environmental costs and benefits.” Consequently, OfReg and/or Cayman Islands Government (CIG) will have to engage consultants to conduct such a study.

Action 3: Commission an Independent Study to determine the Potential of adding more intermittent capacity to the grid which could be released to the CORE programme

The NEP’s Sections 3.3.1.11 d) & e) implies that the government should have regard to the limits of the overall eligible systems in these (RE) programmes and their economic viability. CUC conducted an Infusion Study in 2017 that indicated 15 MW was the optimum amount of non-firm power that could be added to the grid whilst operating their diesel plant at the most efficient level. The ERA and CUC subsequently decided to increase the amount to 17 MW to accommodate more intermittent renewables on the grid.

A new independent study will have to be commissioned to determine what increase (if any), can be accommodated whilst maintaining the optimum engine efficiency and fuel consumption without adversely affecting consumers’ bills. Once again, OfReg, or CUC, and/or Cayman Islands Government (CIG) will have to engage consultants to conduct such a study. The costs of this and other studies will ultimately be borne by consumers.

Appendix 1 – Solar Feed in Tariff Review Terms of Reference

Terms of Reference of the Specific Purpose Ad-hoc Committee to Review Calculations and Factors related to the Draft Determination arising from Consultation on Proposed Renewable Energy Capacity Reallocation and Tariff Setting, 2020.

1. Background

On 16 March 2020, the Office published the Consultation related to the proposed reallocation of renewable energy capacity from the Distributed Energy Resource Programme ("DER") to the Customer Owned Renewable Energy Programme ("CORE") and the applicable tariff (E&U 2020 – 1 – Consultation on the proposed Renewable Energy Capacity Reallocation and Tariff Setting). The consultation paper outlined the legal basis for the capacity reallocation and tariff setting approach. The representations of those responding were considered, and a draft Determination was made on 4 September 2020 (E&U - 2- Draft Determination Proposed Renewable Energy Capacity Reallocation and Tariff Setting).

The Board considered the Draft Determination and voted in favour of the Determination approving the transfer of one Megawatt (1 MW) of capacity from the DER Programme to the CORE Programme at the new tariff of KYD$0.134/kWh.

On September 16, 2020, the Board received direct representation from the Cayman Renewable Energy Association regarding the Board approved Draft Determination prior to its publication as required by the URC Law. As a result, the Board seeks information and advice. Cognizant of the Office's legal obligations and mandate as set out in the Utility Regulation and Competition Law (2019 Revision); the Electricity Sector Regulation Law (2018 Revision); as well as the National Energy Policy ("NEP"), the Office, among other things, will act in a reasonable, proportionate, impartial and consistent manner, to operate transparently to the full extent practicable, and to engage in reasoned decision-making based on the administrative record.

The Board of Directors directed that the Chief Executive Officer ("CEO") establish a technical committee and that the committee complete specific tasks and then report to the Board.

The CEO established a specific purpose ad hoc committee ("SPAC") and provided the following instructions and terms of reference ("ToR").

2. Purpose and Timeline

The purpose of the SPAC is to:

1. confirm the calculation for the grid capacity regarding non-firm renewables referred to in the draft determination;

2. ensure that all relevant factors were considered and included in determining the tariff rate of 13.4 cents per kWh. Factors to be considered shall include but are not be limited to:

(a) an appropriate consideration and weighting for the goals of the NEP;

(b) promotion of innovation within the local industry;

(c) Government's Broad Outcome no. 2 "achieving full employment – jobs for all Caymanians:

(e) the viability of the local renewable industry; and

(f) the interests of consumers.

3. consider the potential for an increase in the amount of non-firm renewables on the Grand Cayman power grid which could be released to the CORE programme.

4. receive written representations on the above points enumerated 1, 2 and 3; and

5. report to the CEO and Board with findings and advice.

The SPAC shall report with advice to the CEO by October 19, 2020. The Board will consider the advice of SPAC and the CEO on October 22, 2020.

3. Composition

The SPAC shall comprise a total of eight members who shall together possess a diverse range of expertise, skills and experience including: energy sector expertise, regulatory principles, environmental, interconnected operations, consumer interests, utilities' business, conservation and demand management, renewable energy technologies, financial literacy and expertise and utilities economic regulation, energy policy development and implementation experience and knowledge.

Members of the Committee shall be as follows

1. The Executive Director Energy and Utilities (OfReg);

2. The Deputy Executive Director Energy and Utilities (OfReg);

3. A representative from the Cayman Islands Renewable Energy Association;

4. A representative from the Caribbean Utilities Company (“CUC”);

5. A representative from the National Energy Policy Committee;

6. A representative from the Ministry of Commerce Planning and Investment;

7. A member from the private or public sector with financial literacy and expertise in finance/accounting or utilities economic regulation;

8. A member from the private sector or public sector with relevant knowledge and experience in the energy sector including consumer interests, environmental aspects and interconnected operations.

4. Duties of Committee Chair

The Executive Director Energy and Utilities (“Chair”) will chair the committee and will:

1. Call meetings of the committee;

2. Chair meetings of the committee;

3. Designate another committee member to chair the committee in the Chair’s absence;

4. Work with and on behalf of OfReg to ensure the objectives of the committee are met;

5. Assist in the development of preparatory materials in advance of the committee meetings;

6. Moderate the Committee meetings – guiding, supporting, and advancing collaborative discussion to ensure the contribution of every member is taken into account;

7. Consider written representations from all stakeholders; and

8. Prepare a report for first the CEO and thereafter the Board on the work of the committee.

The CEO will ensure appropriate allocation of staff resources to support the work of the committee.

5. Duties of Committee Members

The duties of the members of SPAC are to:

1. Comply with the ToR;

2. Exercise good judgement;

3. Discharge his or her responsibilities with diligence by conducting engineering, economic, environmental, financial, legal and regulatory impact analysis;

4. Review all meeting materials prior to each meeting, giving thought to any questions that may be posed in the materials to ensure a productive dialogue;

5. Ensure he or she has adequate information for decision making;

6. Actively engage in ccommittee discussions and provide thoughtful, constructive advice; and

7. Attend all meetings as far as practical in person or via virtual means.

   If a member is unable to participate in a meeting, that member can speak to the Chair in advance so that the Chair can share the member's perspective at the meeting. That member may also submit written comments or documentation in advance of the meeting.

   Submissions required for a meeting that are made after the final meeting will not be considered for decision-making.

6. Meetings of the Committee

The committee shall appoint a secretary from its members who will in advance of each meeting of the committee, circulate the agenda with the matters to be discussed and any relevant documentation. Quorum will consist of a simple majority (50%+1) of members. Minutes from each meeting held will be prepared by the secretary and shared with the members for comment before being finalised by the Chair.

When voting, the majority (50%+1) rules and in the event of a tie vote, the Chair shall have an additional vote. There shall be no proxy or email voting unless explicitly determined by the Chair in advance of a vote. The committee cannot commit the use of the organisation's financial and human resources without prior approval from the CEO.

The Chair may invite a guest into a SPAC meeting who in the opinion of the committee can provide expert advice and guidance on any matter before the committee.

7. Reporting

7.1 The Chair of the SPAC shall prepare a draft report and circulate with members for review and input. The final report shall be submitted to the CEO on October 19, 2020 for submission to the Board Secretary by October 20, 2020.

7.2 The final report shall provide advice to the Board to address, among other things, the following:

(a) Confirming the rate of 13.4 cents per kWh; or

(b) Recommending a revised rate for the CORE programme; and

(c) the potential for an increase in the amount of non-firm power on the local power grid which could be released to the CORE programme.

8. Comment of the CEO

The CEO may add comment to the final report of the committee before submitting it to the Board.

END

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Chief Executive Officer

OfReg

Date: October 2020

Appendix 2 – Hawaiian Electric Company (HECO) CORE Rates

HECO Private Rooftop Solar Programmes

Rooftop Solar Options for New Projects

These programmes are the available options for new solar customers to install solar panels on their rooftops. Some programmes work better with battery storage, and others may restrict exporting during certain times or when circuit capacity is reached to ensure grid stability.

For customers considering rooftop solar on Hawaii Island:

Two available programmes, CGS Plus and Smart Export, have approved solar installation applications that, when built, will fill half the programmes' current capacities allowed by the Public Utilities Commission. There's still room in these programmes for now and we will alert you when 70 percent and 100 percent are reached, as the Commission requires.

- **Customer Grid-Supply Plus (CGS Plus)** systems must include grid support technology to manage grid reliability and allow the utility to remotely monitor system performance, technical compliance and, if necessary, control for grid stability.

- **Smart Export** customers with a renewable system and battery energy storage system have the option to export energy to the grid from 4 p.m. – 9 a.m. Systems must include grid support technology to manage grid reliability and system performance.

- **Customer Self-Supply (CSS)** is intended only for private rooftop solar installations that are designed to not export any electricity to the grid. Customers are not compensated for any export of energy.

- **Customer Grid-Supply (CGS)** participants receive a PUC-approved credit for electricity sent to the grid and are billed at the retail rate for electricity they use from the grid. The programme remains open until the installed capacity has been reached.

Customer Grid-Supply Plus

Customer Grid-Supply Plus (CGS Plus) allows customers to install private rooftop solar or other renewables that export energy to the electric grid throughout the day. CGS Plus also requires the use of equipment that allows the utility to manage output to maintain safe, reliable grid operation.

Customers receive a monthly bill credit for energy delivered to the grid, which helps to offset the cost of energy pulled from the grid when the system isn't producing enough energy to meet the household demand. The export credit is fixed through Oct. 20, 2022.

Island	CGS Plus Credit Rate*
Oahu	10.08 cents/kWh
Maui	12.17 cents/kWh
Lanai	20.80 cents/kWh
Molokai	16.77 cents/kWh
Hawaii Island	10.55 cents/kWh

**Export credits will be trued-up on an annual basis and any remaining credits left over at the end of the year expire with the utility cost reductions benefitting all customers.*

The CGS Plus program has a capacity limit that varies by utility. The available capacity is shown here and CGS Plus+ will remain open until the installed capacity is reached.

CGS Plus Program Capacity	
Oahu	35 MW
Maui County	7 MW
Hawaii Island	7 MW

The safe, reliable operation of the electric grid is important to everyone. The combination of utility system upgrades and leading-edge, customer-facing technology is providing new opportunities to connect more private rooftop solar systems in less time with greater efficiency. All new rooftop solar systems in Hawaii are now required to use advanced inverters that help maintain a stable and reliable grid.

The primary difference between CGS Plus and other programs for private rooftop solar or other renewables is the controllability requirement. In the event of a significant grid emergency, we can disconnect your system from the grid, but only after almost all other generation sources (including the utility's own power plants) have been curtailed. The utility will curtail all CGS Plus systems as a single group or block. Systems that are curtailed under these conditions will not be able to generate electricity until the event is cleared by the utility. Controllability may be managed by a third-party (when and where available) or through a double-meter installation (including one smart meter) by the utility.

Smart Export

Smart Export allows customers to install a private rooftop solar or other renewable system and a battery energy storage system. Customers are expected to charge the battery storage system from the rooftop solar or other renewable system during the daylight hours (9 a.m. – 4 p.m.) and use that energy to power their home in the evening.

However, customers are able to receive a credit for any energy exported to the grid during the evening, overnight and early morning hours. Energy exported to the grid during the daylight hours is not compensated. Under Smart Export, customers receive a monthly bill credit for energy delivered to the grid, which helps to offset the cost of energy pulled from the grid when the customer's system is not producing enough energy to meet the household demand. The export credit is fixed through October 22, 2022.

Island	12 a.m. to 9 a.m.	9 a.m. to 4 p.m.	4 p.m. to 12 a.m.
Oahu	14.97 cents/kWh*	No Credit	14.97 cents/kWh*
Maui	14.41 cents/kWh*	No Credit	14.41 cents/kWh*
Lanai	20.79 cents/kWh*	No Credit	20.79 cents/kWh*
Molokai	16.64 cents/kWh*	No Credit	16.64 cents/kWh*
Hawaii Island	11.00 cents/kWh*	No Credit	11.00 cents/kWh*

**Export credits will be trued-up on an annual basis and any remaining credits left over at the end of the year expire with the utility cost reduction benefitting customers.*

The Smart Export program has a capacity limit that varies by utility. The available capacity is shown here and program will remain open until installed capacity is reached.

Region	Program Capacity
Oahu	25 MW
Maui County	5 MW
Hawaii Island	10 MW

The safe, reliable operation of the grid is important to everyone. The combination of utility system upgrades and leading-edge, customer-facing technology is providing new opportunities to connect more private rooftop solar systems and other renewables in less time with greater efficiency. All new private rooftop solar systems in Hawaii are now required to use advanced inverters that help maintain a stable and reliable grid.

The primary difference between the Smart Export program and other programs is the smart charging and exporting feature. Participants in this program will use advanced (or smart) inverters and advanced metering technology to manage the battery charging, export windows and to maintain stable grid operations.

Customer Self-Supply

Customer Self-Supply (CSS) enables customers to only install private rooftop solar systems that do not export power to the utility grid. These systems can incorporate the use of energy storage devices, like batteries. All power produced by the customer either has to be used as it is produced or stored for later use.

Because CSS systems don't send energy to the grid, they are eligible for expedited review and approval even in areas with existing voltage limitations. Credits are not available for CSS systems and minimum billing requirements apply.

The safe, reliable operation of the grid is important to everyone. The combination of utility system upgrades and leading-edge, customer-facing technology is providing new opportunities to connect more private rooftop solar systems in less time with greater efficiency. All new systems in Hawaii are now required to use advanced inverters that

help maintain a stable and reliable grid.

Customer Grid-Supply (CGS) enables residential and commercial customers to connect private rooftop solar or other renewable systems (up to 100 kW total output capacity) to the electric grid. CGS provides eligible customers with credits on their electric bills for excess electricity sent to the grid or energy delivered by the Company to the customer-generator, whichever is less at a fixed rate approved by the Hawaii Public Utilities Commission through October 20, 2022 (see table below). These credits can help customers offset all or part of their electrical usage and lower their bills. These customers are billed the retail rate for all electricity they use that they receive from the utility.

Island	Credit*
Oahu	15.07¢/kWh
Hawaii	15.14¢/kWh
Maui	17.16¢/kWh
Molokai	24.07¢/kWh
Lanai	27.88¢/kWh

**Export credits may only be used during the month they are generated. Excess monthly credits expire with the utility cost reductions benefiting all customers.*

Program Capacity Remaining

The CGS program has a capacity limit that varies by utility. The available capacity is shown here and program will remain open until installed capacity is reached. Applications received will be processed if and when capacity is available due to other applications being withdrawn from the program.

Island	Original Capacity MWac	Added Capacity*	Total Capacity MWac**
Oahu	25.00	26.31	51.31
Maui County***	5.00	9.12	14.12
Hawaii Island	5.00	4.91	9.91

** Capacity available from Net Energy Metering applications that were cancelled or withdrawn*
*** As of Nov. 7, 2017, the CGS program reached the total capacity allotted. Two new programs have been approved by the PUC on Oct. 20, 2017.*
**** Includes Maui, Molokai and Lanai*

The safe, reliable operation of the grid is important to everyone. The combination of utility system upgrades and leading-edge, customer-facing technology is providing new opportunities to connect more private rooftop solar or other renewable systems in less time with greater efficiency. All new systems in Hawaii are now required to use advanced inverters that help maintain a stable and reliable grid. Click here for more information on how advanced inverters work and what it means for your system.

The CGS program is open, but new applications will be held in queue on a first-come, first-served basis until space in the program becomes available. To apply for this program, you'll need to download and submit the Distributed Energy Resources Application Submittal Form and Agreement (CGS).

Appendix 2 Cont'd - Malta CORE rates

Updated 25-Jan-2019

Sector	Period of approval of FIT	Feed-in tariff -FIT	Other support (if any)	Other conditions (If applicable)	Maximum payment of FIT	Cap on total units/annum for payment of the FIT	Legislation
Residential	10 September 2010 to 31 December 2012	Malta: 25c/kWh for 8 years Gozo: 28c/kWh for 8 years	FIT applicable irrespective on whether the applicant benefits from a grant or not	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and capped at 4800kWh/annum	None	LN 422 of 2010, as amended by LN 70 of 2011, LN 63 of 2012, LN 236 of 2012 and LN 357 of 2012
Residential	1 January 2013 to 30 April 2015	22c/kWh for 6 years;	FIT applicable only where the applicant benefits from a grant	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 139 of 2013 & LN 7 of 2014 & LN 416 of 2014
Non -Residential	10 September 2010 to 31 December 2012	20c/kWh for 7 years	FIT applicable irrespective on whether the applicant benefits from a grant or not	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and capped at 160,000kWh/annum	None	LN 422 of 2010, as amended by LN 70 of 2011, LN 63 of 2012, LN 236 of 2012 and LN 357 of 2012
Non -Residential	1 January 2013 to 30 June 2013	17c/kWh for 7 years	FIT applicable only where the applicant benefits from a grant	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 71 of 2013
Non -Residential	1 July 2013 to 30 April 2015	15c/kWh for 7 years	Grant on investment approved before 1 July 2013	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 271 of 2013 & LN 7 of 2014 & LN416 of 2014
Non -Residential	1 July 2013 to 30 April 2015	11c/kWh for 7 years	Grant on investment approved after 30 June 2013	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 271 of 2013 & LN 7 of 2014 & LN 416 of 2014
Residential and non Residential	1 January 2013 to 30 June 2013	18c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted and < 1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 71 of 2013
Residential and non Residential	1 January 2013 to 30 June 2013	17c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted and >=1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 71 of 2013
Residential and non Residential	1 January 2013 to 30 June 2013	17c/kWh for 20 years	No grant or other support on the capital investment	Ground mounted and < 1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 71 of 2013
Residential and non Residential	1 January 2013 to 30 June 2013	16c/kWh for 20 years	No grant or other support on the capital investment	Ground mounted and >= 1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 71 of 2013
Residential and non Residential	1 July 2013 to 30 September 2013	17c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted and < 1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 253 of 2013

Sector	Period of approval of FIT	Feed-in tariff -FIT	Other support (if any)	Other conditions (If applicable)	Maximum payment of FIT	Cap on total units/annum for payment of the FIT	Legislation
Residential and non Residential	1 July 2013 to 30 September 2013	16c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted and >=1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 253 of 2013
Residential and non Residential	1 July 2013 to 30 September 2013	16c/kWh for 20 years	No grant or other support on the capital investment	Ground mounted and < 1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 253 of 2013
Residential and non Residential	1 July 2013 to 30 September 2013	15.5c/kWh for 20 years	No grant or other support on the capital investment	Ground mounted and >= 1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 253 of 2013
Residential and non Residential	1 May 2014 to 31 October 2014	16.5c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted only and < 40 kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 155 of 2014
Residential and non Residential	1 May 2014 to 31 October 2014	16c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted only and >=40kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 155 of 2014
Residential and non Residential	1 November 2014 to 30 April 2015	15.5c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted only and < 40 kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 155 of 2014
Residential and non Residential	1 November 2014 to 30 November 2014	15c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted only and >=40kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 155 of 2014 & LN 416 of 2014
Residential and non Residential	1 December 2014 to 30 April 2015	15c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted only and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	9.6GWh (6MWp) per annum	LN 416 of 2014
Residential	13 July 2015 to 30 June 2016	16.5c/kWh for 6 years	FIT applicable only where the applicant benefits from a grant	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 264 of 2015
Residential and non Residential	3 August 2015 to 30 June 2017	15.5c/kWh for 20 years	No grant or other support on the capital investment	Installed in any location and >=1kWp and < 40 kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	17.6GWh (11MWp) per annum	LN 264 of 2015 & extended by LN415 of 2015 & extended by LN237 of 2016 & extended by LN32 of 2017
Residential and non Residential	3 August 2015 to 29 January 2016	15c/kWh for 20 years	No grant or other support on the capital investment	Installed in any location and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	17.6 GWh (11MWp) per annum	LN 264 of 2015
Residential and non Residential	2 December 2015 to 30 December 2016	15c/kWh for 20 years	No grant or other support on the capital investment	Any installation (excluding structure integrated solar photovoltaic installations)and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	28.8 GWh (18MWp) per annum	LN 415 of 2015 & extended by LN237 of 2016 & extended by LN 346 of 2016

Sector	Period of approval of FIT	Feed-in tariff -FIT	Other support (if any)	Other conditions (If applicable)	Maximum payment of FIT	Cap on total units/annum for payment of the FIT	Legislation
Residential and non Residential	2 November 2015 to 30 June 2016	15c/kWh for 20 years	No grant or other support on the capital investment	Structure integrated solar photovoltaic installations and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 365 of 2015
Residential	13 July 2015 to 30 December 2016	16.5c/kWh for 6 years	FIT applicable only where the applicant benefits from a grant	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 237 of 2016
Residential and non Residential	1 February 2017 to 30 June 2017	15c/kWh for 20 years	No grant or other support on the capital investment	Installed in any location and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	8.0 GWh (5MWp) per annum extended by a further 4.8GWh (3MWp) for a total of 12.8GWh (8MWp)	LN 32 of 2017 extended by LN 104 of 2017
Residential	3 July 2017 to 31 December 2018	16.5c/kWh for 6 years	FIT applicable only where the applicant benefits from a grant	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	**LN 200 of 2017**
Residential and non Residential	3 July 2017 to 31 December 2018	15.5c/kWh for 20 years	No grant or other support on the capital investment	Installed in any location and >=1kWp and < 40 kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	13.12GWh (8.2MWp) per annum	**LN 200 of 2017 extended by LN 381 of 2017 extended by LN 160 of 2018**
Residential and non Residential	3 July 2017 to 31 December 2018	14c5/kWh for 20 years	No grant or other support on the capital investment	Installed in any location and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	12.8 GWh (8MWp) per annum extended by a further 16GWh (10MWp) for a total of 28.8GWh (18MWp) and further extended to 84.8GWh (53MWp)	**LN 200 of 2017 LN 338 of 2017 extended by LN 381 of 2017 extended by LN 149 of 2018**
Residential and non Residential	2 January 2019 to 30 December 2019	15.5c/kWh for 20 years	No grant or other support on the capital investment	Installed in any location and >=1kWp and < 40 kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	12.8GWh (8MWp) per annum	**LN 2 of 2019**
Residential and non Residential	2 January 2019 to 30 December 2019	14c5/kWh for 20 years for new approved applications received till 30 Nov 2018; 14c/kWh for 20 years for application recieved after the 30 Nov 2018	No grant or other support on the capital investment	Installed in any location and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	40 GWh (25MWp) per annum	**LN 2 of 2019**

Sector	Period of approval of FIT	Feed-in tariff -FIT	Other support (if any)	Other conditions (If applicable)	Maximum payment of FIT	Cap on total units/annum for payment of the FIT	Legislation
Residential	2 January 2019 to 30 December 2019	16.5c/kWh for 6 years	FIT applicable only where the applicant benefits from a grant	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	**LN 2 of 2019**

Notes: (1) PV systems that do not benefit from any of the feed-in tariffs above and installed mainly for own consumption may be paid the marginal cost for any surplus exported to the grid (Regulation 4A-LN 416 of 2014 & LN 171 of 2015)
(2) LN means Legal Notice

Appendix 3 – OfReg FITs Calculation Methodology

FEED-IN TARIFF (FIT) CALCULATION METHODOLOGY – CORE RATES

The E&U team considered decisions made in other jurisdictions (Australia, Bermuda, Malta, and Tasmania) and the specific circumstances in the Cayman Islands in determining the proposed Customer-Owned Renewable Energy (CORE) rate of KYD$0.134/kWh.

The initial CORE feed-in-tariff set by the former Electricity Regulatory Authority (ERA) did not reflect any specific overarching goals or specific economic analysis. However, The ERA used a 10% IRR as a reasonable return for the investor to invest in CORE. The 10% was based on the system prices at the time. Essentially, it was intended as a 'price discovery' mechanism. The initial tariff intent was to test the market and incentivise early adopters and it was very successful in achieving this.

A global overview of FIT policies shows that a variety of approaches are used, which reflects diversity in the policy goals. These diverse approaches can be split into four basic categories.

1) **Based on the actual levelised cost of renewable energy generation**. This approach is the most commonly used in the EU, and has been the most successful at driving RE development globally (Klein et al. 2008, REN21 2009).

2) **Based on the "value" of renewable energy generation** either to society, or to the utility, generally expressed in terms of "avoided costs." This approach is used in California, as well as in British Columbia (CPUC 2008a, DSIRE 2009b, BC Hydro 2008).

3) **Offered as a fixed-price incentive** without regard to levelised RE generation costs or avoided costs. This approach is used by certain utilities in the U.S. (Couture and Cory 2009).

4) **Based on the results of an auction or bidding process**, which can help advise price discovery by appealing to the market directly. An auction-based mechanism can be applied and differentiated based on different technologies, project sizes, etc., and is a variation on the cost-based approach.

The basis in deciding a fair and reasonable feed-in-tariff is consideration of what is fair to all consumers of electricity.

Independent regulatory bodies in most states have determined a 'fair and reasonable' feed-in tariff for solar energy exported to the grid. This is meant to reflect the average price a household would receive if they were to sell their solar energy on the wholesale market, but also set so that retail electricity prices do not increase for other consumers.

Forcing suppliers to pay a fixed export tariff that yields greater costs to them than benefits (as the 24c/kWh may have done), could lead to perverse incentives and create distortions in the market. Imposing an export tariff greater than the value of exports would result in suppliers bearing disproportionate costs of participating in the FIT scheme since the export tariff will not be allowed into the levelisation process. This would also risk electricity consumers bearing disproportionate costs when the aim is for costs to be spread evenly.

It should be noted that as rates of return are increased, costs to consumers will increase both due the fact that the associated higher tariffs yield higher uptake levels, but also because those

generators who were already willing to invest at lower rates of return are now provided with excess rates (reducing the cost-effectiveness of the scheme).

1) Impact on Bills

Continuing a subsidy framework for small-scale low carbon electricity generation via a FITs policy will incur resource costs to the economy. Net subsidy costs will also be incurred. Electricity consumers are expected to bear the subsidy costs given that FITs payments are to be paid by energy suppliers, who are then expected to pass these costs on to consumers via increased electricity bills.

2) Impact on Grid Stability and Reliability

Intermittent technologies (e.g. wind, solar PV) increase the complexity and risk involved in balancing the grid, avoiding power outages and forced curtailment. Storage capacity (and cost) is needed to increase the uptake of intermittent RE and these are above and beyond the cost of any subsidized FIT rate. And/or demand side flexibility will be required to manage short-term fluctuations in the supply-demand balance. There will be associated additional costs to mitigate these fluctuations.

Where grid resilience is concerned, a greater number of smaller electricity generating installations distributed around the country should increase the grid's ability to withstand major interruptions. However, with the Cayman Islands small land mass this is quickly obviated with island-wide cloud coverage especially during inclement weather conditions.

3) Transmission and Distribution (T&D) Losses

Small-scale generation incentivised by FITs will be, in nearly all cases, nearer to sources of electricity demand than the large sources of generation that it will displace. This will reduce transmission and distribution losses which occur when electricity is transmitted from power stations to centres of demand. The degree to which this has an impact will rely on where FITs installations are located relative to sources of demand and grid infrastructure. Theoretically, transmission costs can be avoided via the purchase of excess electricity produced by solar PV systems as less electricity is produced by other generation sources and therefore less electricity is transmitted via the T&D system to customers.

However, regulators in other jurisdictions have considered that these costs are not avoidable and therefore should not be taken into account in calculating the FIT rate paid to solar PV systems owners.

OfReg consulted with Caribbean Utilities Company Ltd., (CUC) to verify their rate structure and whether its transmission and distribution (T&D) costs cost be avoided. Based on these discussions and akin to other jurisdictions, OfReg understands that the transmission charges are based on the amount of metered consumption at a customer's premises. This means that T&D charges are levied on customers regardless of where energy is obtained, be it from CUC's diesel generation or from a neighbouring rooftop solar PV system. Additionally, these T&D charges are directly passed on to other customers. Therefore, CUC cannot derive a financial benefit from avoided transmission changes arising from the purchase of excess solar electricity exported to the grid by solar PV customers.

4) Engagement

An important benefit of small-scale solar PV systems installations incentivised by the FITs will be increased public engagement with renewable energy (RE) generation and behavioural change with regard to energy use. This benefit has not been quantified.

Currently, the National Energy Policy (NEP) requires that the FIT will, at most, allow only compensation arising from the following sources. The NEP states inter alia in Section 3.3.1.11: "Promote grid-connected consumer owned renewable energy programmes in Grand Cayman, Cayman Brac and Little Cayman in a framework which provides:

(a) Rates reflective of the full costs and benefits of distributed renewable energy including economic, social and environmental costs and benefits.
(b) An appropriate billing mechanism.
(c) A simple and safe interconnection arrangement through a standard agreement and for a reasonable term.
(d) Reasonable limits to the individual and overall eligible systems having regard to economic and technical considerations that may evolve over time.
(e) The ability to review and reset programmes appropriately, having regard to technology advances, system capacity considerations and other economic and technical factors."

This requires that the FIT for distributed generation systems reflect the system-wide costs and benefits of this technology and periodic rate adjustments per (e).

The FIT is therefore based on the avoided cost of generation (which is precisely the LCOE of portfolio 5 which includes all generation costs (capacity, fuel, RE, additional storage, etc.), and economic benefits and such other benefits that may from time to time be established by the NEP and/or the relevant guidance from the government.

1) **Avoided cost of generation**. This is the cost of generation that the Transmission & Distribution ("T&D") Licensee avoids by purchasing power from distributed generation.

2) **Economic benefits**. Economic benefits associated with distributed generation.

5) Avoided cost of generation

Firstly, the following categories are directly applicable in assessing the net avoided cost of generation which would comprise a benefit from the installation of distributed generation of renewable energy.

(a) **Reduction in fuel costs and other variable operating costs of generation**. Distributed generation (DG) of RE may allow the evasion of some variable operating costs of overall system generation that would otherwise be encountered. For example, since DGs supply RE to the network, the T&D Licensee can then produce and/or buy less energy from a conventional bulk generation licensee. In Cayman's case the former applies. Consequently, CUC reduces its fuel costs and other variable operating costs. The decrease in fuel costs and other variable costs does not have to be estimated based on the costs of conventional bulk generators currently connected to the network. For example, where data is available, it would be apt to consider the reduction in costs that would accrue in a projected least-cost scenario within an integrated resource planning ("IRP") process. This is what the Office has done in considering Portfolio 5 of the IRP.

(b) **Reduction in further generation capacity requirements.** DG may lessen the need for additional investment in traditional bulk generation capacity. For example, if, according to the IRP, the existing bulk generation licensees' capacity is not sufficient to meet total demand, or is not able to maintain the required level of system reliability, a significant amount of DG capacity could avoid some additional fixed costs of installing further traditional bulk generation capacity. However, this situation does not obtain in Cayman.

(c) **Reduction in the T&D Licensee's network losses.** Where there is a high correlation between a customer's demand and on-site generation, the energy losses associated with transmission and distribution may decrease with connecting distributed generators to the network.

Additionally, the following categories are indirectly applicable in estimating the net avoided cost of generation, resulting from the deployment of DG of RE:

(a) **Increase in the network costs of the T&D Licensee.** Integration of DG facilities to the existing grid may increase the T&D licensee's network costs associated with providing the required connection assets, network reinforcements and metering services.
(b) **Increase in the cost of system balancing and associated services.** For example frequency response and operating reserves, especially arising from intermittent DG such as solar photovoltaic ("solar PV") generation. Introducing DG to an electricity system can be expected to increase the amount of dispatchable generation capacity that must be held in reserve, to cope with short-term fluctuations in electricity output due to variable solar or wind conditions.
(c) **Increase in the cost of economic stranding of existing generation or network assets.** Significant DG capacity may displace some capacity of bulk generation licensee(s) or lead to under-utilisation of network assets. This could entail a system cost in the form of economic stranding of existing generation and network assets.
(d) **Changes in thermal plant efficiency.** Adding variable DG to a grid can cause a reduction in the conversion efficiency of thermal plants, due to (among other things) more frequent changes in the output of load-following plant assets, greater use of more flexible but potentially less efficient plants, more frequent plant 'start-up' and 'shutdown' measures, and the general efficiency design of the plants.

6) Economic benefits

There are a number of economic benefits and costs that could produce wider government policy objectives.
The size of such benefits would depend on the appropriate guidance from the government and can include the following:

(a) Reduction in costs associated with meeting environmental standards. DG of RE is likely to provide environmental benefits relative to existing and planned traditional generation. An increase of DG of RE would thus assist in achieving the Cayman Islands Government's (CIG's) environmental objectives. Since CUC (the T&D Licensee) is subject to explicit environmental performance targets, the environmental benefits of DG may be measured as the reduction in the cost to CUC of meeting its environmental performance targets. Absent any explicit environmental performance targets or incentive schemes, environmental benefits can be estimated using metrics e.g. traded carbon prices to value the decrease in carbon emissions. The addition of such benefits in the determination of the level of the FIT should be guided by government policy. However, there is no official CIG Climate Action Policy and OfReg is unaware of any carbon trading initiatives being conducted by CIG.

(b) Increased economic activity. The distribution of the benefits from increased economic activity (such as gross value added from direct employment or taxes generated from economic activity in relation to the installation of solar PV in the Cayman Islands) should also be subject to guidance from the government. Based on government policy, the value impact of the increase in distributed generation on wider economic activity may be reflected in the FIT. Including the benefit from increased economic activity in the calculation of the FIT would shift the incidence value of these benefits from the wider economy to the distributed generators.

7) Calculation of the FIT in Other Jurisdictions

1) **Calculation of the FIT based on avoided costs and economic benefits (RA Bermuda)**

The FIT shall be calculated as the sum of the avoided cost of generation and any net economic and/or other benefits, divided by forecast system total kWh produced by distributed generators. It will be important to consider avoided cost of generation, net economic benefits and production over the same period (the "Period"), e.g. on an annual basis. As a formula, the FIT is calculated as follows:

$$\text{FIT(\$/kWh)} = \frac{\text{avoided cost of generation (\$/Period)} + \text{economic and/or other benefits (\$/Period)}}{\text{forecast system production by distributed generators (kWh/Period)}}$$

The RA noted that there are general limitations to the calculation of individual components of net avoided cost of generation and net economic benefits. Particularly, cost categories may overlap. For example, an increased system reserve requirement for short-term balancing may interact with the required capacity margin needed to meet peak demand. Therefore, it is important to ensure that the avoided system costs and other net economic benefits are not double counted.

2) Calculation of a 'fair and reasonable' FIT in Australia and Tasmania is based on:

- wholesale electricity costs
- network losses; and
- NEM fees.

Where NEM is the National Electricity Market fees paid by electricity retailers.

Based on the foregoing, and in the absence of any CIG information or economists' assessments of the economic and/or other benefits, network losses and no NEM fees (the cost of fuel may be an appropriate substitute for these), and recognising that in the IRP the assumed compensation rate for any surplus power sold back to CUC is based on lower of avoided cost and solar levelised cost of energy, the Office determined that it was appropriate to calculate the new CORE tariff using the following methodology:

The projected IRP 2020 avoided cost rate $/kWh + an approximated subsidy (which could include economic and/or other benefits)

$0.1168	+	$0.0172	=	$0.134

N.B. The average avoided fuel cost for 2020 has been 10.5 cents to date. So this would more like a 2.9 cent subsidy. The average avoided cost of the IRP in exhibit 59 over the 2021-2045

period was actually 8.8 cents/kWh so the approximate subsidy in 13.4 cents is more like 4.6 cents/kWh.

Whilst some stakeholders may consider this a simplistic solution, the Office is open to receiving recommendations for a more mathematical equation to assist in deriving a fair and equitable CORE tariff.

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Utility Regulation and Competition Office

2/10/2021

Appendix 1 – Solar Feed in Tariff Review Terms of Reference

Terms of Reference of the Specific Purpose Ad-hoc Committee to Review Calculations and Factors related to the Draft Determination arising from Consultation on Proposed Renewable Energy Capacity Reallocation and Tariff Setting, 2020.

1. Background

On 16 March 2020, the Office published the Consultation related to the proposed reallocation of renewable energy capacity from the Distributed Energy Resource Programme ("DER") to the Customer Owned Renewable Energy Programme ("CORE") and the applicable tariff (E&U 2020 – 1 – Consultation on the proposed Renewable Energy Capacity Reallocation and Tariff Setting). The consultation paper outlined the legal basis for the capacity reallocation and tariff setting approach. The representations of those responding were considered, and a draft Determination was made on 4 September 2020 (E&U - 2- Draft Determination Proposed Renewable Energy Capacity Reallocation and Tariff Setting).

The Board considered the Draft Determination and voted in favour of the Determination approving the transfer of one Megawatt (1 MW) of capacity from the DER Programme to the CORE Programme at the new tariff of KYD$0.134/kWh.

On September 16, 2020, the Board received direct representation from the Cayman Renewable Energy Association regarding the Board approved Draft Determination prior to its publication as required by the URC Law. As a result, the Board seeks information and advice. Cognizant of the Office's legal obligations and mandate as set out in the Utility Regulation and Competition Law (2019 Revision); the Electricity Sector Regulation Law (2018 Revision); as well as the National Energy Policy ("NEP"), the Office, among other things, will act in a reasonable, proportionate, impartial and consistent manner, to operate transparently to the full extent practicable, and to engage in reasoned decision-making based on the administrative record.

The Board of Directors directed that the Chief Executive Officer ("CEO") establish a technical committee and that the committee complete specific tasks and then report to the Board.

The CEO established a specific purpose ad hoc committee ("SPAC") and provided the following instructions and terms of reference ("ToR").

2. Purpose and Timeline

The purpose of the SPAC is to:

(a) confirm the calculation for the grid capacity regarding non-firm renewables referred to in the draft determination;

(b) ensure that all relevant factors were considered and included in determining the tariff rate of 13.4 cents per kWh. Factors to be considered shall include but are not be limited to:

(c) consider and weigh for the goals of the NEP;

(d) promote of innovation within the local industry;

(e) consider Government's Broad Outcome no. 2 "achieving full employment – jobs for all Caymanians"; the viability of the local renewable industry, and the interests of consumers.;

(f) consider the potential for an increase in the amount of non-firm renewables on the Grand Cayman power grid which could be released to the CORE programme.

(g) receive written representations on the above points enumerated 1, 2 and 3; and

(h) report to the CEO and Board with findings and advice.

The SPAC shall report with advice to the CEO by October 19, 2020. The Board will consider the advice of SPAC and the CEO on October 22, 2020.

3. Composition

The SPAC shall comprise a total of eight members who shall together possess a diverse range of expertise, skills and experience including: energy sector expertise, regulatory principles, environmental, interconnected operations, consumer interests, utilities' business, conservation and demand management, renewable energy technologies, financial literacy and expertise and utilities economic regulation, energy policy development and implementation experience and knowledge.

Members of the Committee shall be as follows

(a) The Executive Director Energy and Utilities (OfReg);
(b) The Deputy Executive Director Energy and Utilities (OfReg);

(c) A representative from the Cayman Islands Renewable Energy Association;
(d) A representative from the Caribbean Utilities Company ("CUC");
(e) A representative from the National Energy Policy Committee;
(f) A representative from the Ministry of Commerce Planning and Investment;
(g) A member from the private or public sector with financial literacy and expertise in finance/accounting or utilities economic regulation; and
(h) A member from the private sector or public sector with relevant knowledge and experience in the energy sector including consumer interests, environmental aspects and interconnected operations.

4. Duties of Committee Chair

The Executive Director Energy and Utilities ("Chair") will chair the committee and will:

(a) call meetings of the committee;
(b) chair meetings of the committee;
(c) designate another committee member to chair the committee in the Chair's absence;
(d) work with and on behalf of OfReg to ensure the objectives of the committee are met;
(e) assist in the development of preparatory materials in advance of the committee meetings;
(f) moderate the Committee meetings – guiding, supporting, and advancing collaborative discussion to ensure the contribution of every member is taken into account;
(g) consider written representations from all stakeholders; and
(h) prepare a report for first the CEO and thereafter the Board on the work of the committee.

The CEO will ensure appropriate allocation of staff resources to support the work of the committee.

5. Duties of Committee Members

The duties of the members of SPAC are to:

(a) comply with the ToR;
(b) exercise good judgement;
(c) discharge his or her responsibilities with diligence by conducting engineering, economic, environmental, financial, legal and regulatory impact analysis;
(d) review all meeting materials prior to each meeting, giving thought to any questions that may be posed in the materials to ensure a productive dialogue;
(e) ensure he or she has adequate information for decision making;
(f) actively engage in committee discussions and provide thoughtful, constructive advice; and
(g) attend all meetings as far as practical in person or via virtual means.

If a member is unable to participate in a meeting, that member can speak to the Chair in advance so that the Chair can share the member's perspective at the meeting. That member may also submit written comments or documentation in advance of the meeting. Submissions required for a meeting that are made after the final meeting will not be considered for decision-making.

6. Meetings of the Committee

The committee shall appoint a secretary from its members who will in advance of each meeting of the committee, circulate the agenda with the matters to be discussed and any relevant documentation. Quorum will consist of a simple majority (50%+1) of members. Minutes from each meeting held will be prepared by the secretary and shared with the members for comment before being finalised by the Chair.

When voting, the majority (50%+1) rules and in the event of a tie vote, the Chair shall have an additional vote. There shall be no proxy or email voting unless explicitly determined by the Chair in advance of a vote. The committee cannot commit the use of the organisation's financial and human resources without prior approval from the CEO.

The Chair may invite a guest into a SPAC meeting who in the opinion of the committee can provide expert advice and guidance on any matter before the committee.

7. Reporting

7.1 The Chair of the SPAC shall prepare a draft report and circulate with members for review and input. The final report shall be submitted to the CEO on October 19, 2020 for submission to the Board Secretary by October 20, 2020.

7.2 The final report shall provide advice to the Board to address, among other things, the following:

(a) Confirming the rate of 13.4 cents per kWh; or

(b) Recommending a revised rate for the CORE programme; and

(c) the potential for an increase in the amount of non-firm power on the local power grid which could be released to the CORE programme.

8. Comment of the CEO

The CEO may add comment to the final report of the committee before submitting it to the Board.

END

Chief Executive Officer

OfReg

Date: October 2020

Appendix 2 – Hawaiian Electric Company (HECO) CORE Rates

HECO Private Rooftop Solar Programmes

Rooftop Solar Options for New Projects

These programmes are the available options for new solar customers to install solar panels on their rooftops. Some programmes work better with battery storage, and others may restrict exporting during certain times or when circuit capacity is reached to ensure grid stability.

For customers considering rooftop solar on Hawaii Island:

Two available programmes, CGS Plus and Smart Export, have approved solar installation applications that, when built, will fill half the programmes' current capacities allowed by the Public Utilities Commission. There's still room in these programmes for now and we will alert you when 70 percent and 100 percent are reached, as the Commission requires.

- **Customer Grid-Supply Plus (CGS Plus)** systems must include grid support technology to manage grid reliability and allow the utility to remotely monitor system performance, technical compliance and, if necessary, control for grid stability.

- **Smart Export** customers with a renewable system and battery energy storage system have the option to export energy to the grid from 4 p.m. – 9 a.m. Systems must include grid support technology to manage grid reliability and system performance.

- **Customer Self-Supply (CSS)** is intended only for private rooftop solar installations that are designed to not export any electricity to the grid. Customers are not compensated for any export of energy.

- **Customer Grid-Supply (CGS)** participants receive a PUC-approved credit for electricity sent to the grid and are billed at the retail rate for electricity they use from the grid. The programme remains open until the installed capacity has been reached.

Customer Grid-Supply Plus

Customer Grid-Supply Plus (CGS Plus) allows customers to install private rooftop solar or other renewables that export energy to the electric grid throughout the day. CGS Plus also requires the use of equipment that allows the utility to manage output to maintain safe, reliable grid operation.

Customers receive a monthly bill credit for energy delivered to the grid, which helps to offset the cost of energy pulled from the grid when the system isn’t producing enough energy to meet the household demand. The export credit is fixed through Oct. 20, 2022.

Island	CGS Plus Credit Rate*
Oahu	10.08 cents/kWh
Maui	12.17 cents/kWh
Lanai	20.80 cents/kWh
Molokai	16.77 cents/kWh
Hawaii Island	10.55 cents/kWh

**Export credits will be trued-up on an annual basis and any remaining credits left over at the end of the year expire with the utility cost reductions benefitting all customers.*

The CGS Plus program has a capacity limit that varies by utility. The available capacity is shown here and CGS Plus+ will remain open until the installed capacity is reached.

CGS Plus Program Capacity	
Oahu	35 MW
Maui County	7 MW
Hawaii Island	7 MW

The safe, reliable operation of the electric grid is important to everyone. The combination of utility system upgrades and leading-edge, customer-facing technology is providing new opportunities to connect more private rooftop solar systems in less time with greater efficiency. All new rooftop solar systems in Hawaii are now required to use advanced inverters that help maintain a stable and reliable grid.

The primary difference between CGS Plus and other programs for private rooftop solar or other renewables is the controllability requirement. In the event of a significant grid emergency, we can disconnect your system from the grid, but only after almost all other generation sources (including the utility's own power plants) have been curtailed. The utility will curtail all CGS Plus systems as a single group or block. Systems that are curtailed under these conditions will not be able to generate electricity until the event is cleared by the utility. Controllability may be managed by a third-party (when and where available) or through a double-meter installation (including one smart meter) by the utility.

Smart Export

Smart Export allows customers to install a private rooftop solar or other renewable system and a battery energy storage system. Customers are expected to charge the battery storage system from the rooftop solar or other renewable system during the daylight hours (9 a.m. – 4 p.m.) and use that energy to power their home in the evening.

However, customers are able to receive a credit for any energy exported to the grid during the evening, overnight and early morning hours. Energy exported to the grid during the daylight hours is not compensated. Under Smart Export, customers receive a monthly bill credit for energy delivered to the grid, which helps to offset the cost of energy pulled from the grid when the customer's system is not producing enough energy to meet the household demand. The export credit is fixed through October 22, 2022.

Island	12 a.m. to 9 a.m.	9 a.m. to 4 p.m.	4 p.m. to 12 a.m.
Oahu	14.97 cents/kWh*	No Credit	14.97 cents/kWh*
Maui	14.41 cents/kWh*	No Credit	14.41 cents/kWh*
Lanai	20.79 cents/kWh*	No Credit	20.79 cents/kWh*
Molokai	16.64 cents/kWh*	No Credit	16.64 cents/kWh*
Hawaii Island	11.00 cents/kWh*	No Credit	11.00 cents/kWh*

**Export credits will be trued-up on an annual basis and any remaining credits left over at the end of the year expire with the utility cost reduction benefitting customers.*

The Smart Export program has a capacity limit that varies by utility. The available capacity is shown here and program will remain open until installed capacity is reached.

Region	Program Capacity
Oahu	25 MW
Maui County	5 MW
Hawaii Island	10 MW

The safe, reliable operation of the grid is important to everyone. The combination of utility system upgrades and leading-edge, customer-facing technology is providing new opportunities to connect more private rooftop solar systems and other renewables in less time with greater efficiency. All new private rooftop solar systems in Hawaii are now required to use advanced inverters that help maintain a stable and reliable grid.

The primary difference between the Smart Export program and other programs is the smart charging and exporting feature. Participants in this program will use advanced (or

smart) inverters and advanced metering technology to manage the battery charging, export windows and to maintain stable grid operations.

Customer Self-Supply

Customer Self-Supply (CSS) enables customers to only install private rooftop solar systems that do not export power to the utility grid. These systems can incorporate the use of energy storage devices, like batteries. All power produced by the customer either has to be used as it is produced or stored for later use.

Because CSS systems don't send energy to the grid, they are eligible for expedited review and approval even in areas with existing voltage limitations. Credits are not available for CSS systems and minimum billing requirements apply.

The safe, reliable operation of the grid is important to everyone. The combination of utility system upgrades and leading-edge, customer-facing technology is providing new opportunities to connect more private rooftop solar systems in less time with greater efficiency. All new systems in Hawaii are now required to use advanced inverters that help maintain a stable and reliable grid.

Customer Grid-Supply (CGS) enables residential and commercial customers to connect private rooftop solar or other renewable systems (up to 100 kW total output capacity) to the electric grid. CGS provides eligible customers with credits on their electric bills for excess electricity sent to the grid or energy delivered by the Company to the customer-generator, whichever is less at a fixed rate approved by the Hawaii Public Utilities Commission through October 20, 2022 (see table below). These credits can help customers offset all or part of their electrical usage and lower their bills. These customers are billed the retail rate for all electricity they use that they receive from the utility.

Island	Credit*
Oahu	15.07¢/kWh
Hawaii	15.14¢/kWh
Maui	17.16¢/kWh
Molokai	24.07¢/kWh
Lanai	27.88¢/kWh

**Export credits may only be used during the month they are generated. Excess monthly credits expire with the utility cost reductions benefiting all customers.*

Program Capacity Remaining

The CGS program has a capacity limit that varies by utility. The available capacity is shown here and program will remain open until installed capacity is reached. Applications received will be processed if and when capacity is available due to other applications being withdrawn from the program.

Island	Original Capacity MWac	Added Capacity*	Total Capacity MWac**
Oahu	25.00	26.31	51.31
Maui County***	5.00	9.12	14.12
Hawaii Island	5.00	4.91	9.91

** Capacity available from Net Energy Metering applications that were cancelled or withdrawn*
*** As of Nov. 7, 2017, the CGS program reached the total capacity allotted. Two new programs have been approved by the PUC on Oct. 20, 2017.*
**** Includes Maui, Molokai and Lanai*

The safe, reliable operation of the grid is important to everyone. The combination of utility system upgrades and leading-edge, customer-facing technology is providing new opportunities to connect more private rooftop solar or other renewable systems in less time with greater efficiency. All new systems in Hawaii are now required to use advanced inverters that help maintain a stable and reliable grid. Click here for more information on how advanced inverters work and what it means for your system.

The CGS program is open, but new applications will be held in queue on a first-come, first-served basis until space in the program becomes available. To apply for this program, you'll need to download and submit the Distributed Energy Resources Application Submittal Form and Agreement (CGS).

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11/17/20

Appendix 2 Cont'd - Malta CORE rates

Updated 25-Jan-2019

Sector	Period of approval of FIT	Feed-in tariff -FIT	Other support (if any)	Other conditions (If applicable)	Maximum payment of FIT	Cap on total units/annum for payment of the FIT	Legislation
Residential	10 September 2010 to 31 December 2012	Malta: 25c/kWh for 8 years Gozo: 28c/kWh for 8 years	FIT applicable irrespective on whether the applicant benefits from a grant or not	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and capped at 4800kWh/annum	None	LN 422 of 2010, as amended by LN 70 of 2011, LN 63 of 2012, LN 236 of 2012 and LN 357 of 2012
Residential	1 January 2013 to 30 April 2015	22c/kWh for 6 years;	FIT applicable only where the applicant benefits from a grant	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 139 of 2013 & LN 7 of 2014 & LN 416 of 2014
Non -Residential	10 September 2010 to 31 December 2012	20c/kWh for 7 years	FIT applicable irrespective on whether the applicant benefits from a grant or not	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and capped at 160,000kWh/annum	None	LN 422 of 2010, as amended by LN 70 of 2011, LN 63 of 2012, LN 236 of 2012 and LN 357 of 2012
Non -Residential	1 January 2013 to 30 June 2013	17c/kWh for 7 years	FIT applicable only where the applicant benefits from a grant	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 71 of 2013
Non -Residential	1 July 2013 to 30 April 2015	15c/kWh for 7 years	Grant on investment approved before 1 July 2013	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 271 of 2013 & LN 7 of 2014 & LN416 of 2014
Non -Residential	1 July 2013 to 30 April 2015	11c/kWh for 7 years	Grant on investment approved after 30 June 2013	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 271 of 2013 & LN 7 of 2014 & LN 416 of 2014
Residential and non Residential	1 January 2013 to 30 June 2013	18c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted and < 1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 71 of 2013
Residential and non Residential	1 January 2013 to 30 June 2013	17c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted and >=1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 71 of 2013
Residential and non Residential	1 January 2013 to 30 June 2013	17c/kWh for 20 years	No grant or other support on the capital investment	Ground mounted and < 1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 71 of 2013
Residential and non Residential	1 January 2013 to 30 June 2013	16c/kWh for 20 years	No grant or other support on the capital investment	Ground mounted and >= 1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 71 of 2013
Residential and non Residential	1 July 2013 to 30 September 2013	17c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted and < 1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 253 of 2013

Sector	Period of approval of FIT	Feed-in tariff -FIT	Other support (if any)	Other conditions (If applicable)	Maximum payment of FIT	Cap on total units/annum for payment of the FIT	Legislation
Residential and non Residential	1 July 2013 to 30 September 2013	16c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted and >=1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 253 of 2013
Residential and non Residential	1 July 2013 to 30 September 2013	16c/kWh for 20 years	No grant or other support on the capital investment	Ground mounted and < 1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 253 of 2013
Residential and non Residential	1 July 2013 to 30 September 2013	15.5c/kWh for 20 years	No grant or other support on the capital investment	Ground mounted and >= 1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 253 of 2013
Residential and non Residential	1 May 2014 to 31 October 2014	16.5c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted only and < 40 kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 155 of 2014
Residential and non Residential	1 May 2014 to 31 October 2014	16c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted only and >=40kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 155 of 2014
Residential and non Residential	1 November 2014 to 30 April 2015	15.5c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted only and < 40 kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 155 of 2014
Residential and non Residential	1 November 2014 to 30 November 2014	15c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted only and >=40kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 155 of 2014 & LN 416 of 2014
Residential and non Residential	1 December 2014 to 30 April 2015	15c/kWh for 20 years	No grant or other support on the capital investment	Roof mounted only and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	9.6GWh (6MWp) per annum	LN 416 of 2014
Residential	13 July 2015 to 30 June 2016	16.5c/kWh for 6 years	FIT applicable only where the applicant benefits from a grant	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 264 of 2015
Residential and non Residential	3 August 2015 to 30 June 2017	15.5c/kWh for 20 years	No grant or other support on the capital investment	Installed in any location and >=1kWp and < 40 kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	17.6GWh (11MWp) per annum	LN 264 of 2015 & extended by LN415 of 2015 & extended by LN237 of 2016 & extended by LN32 of 2017
Residential and non Residential	3 August 2015 to 29 January 2016	15c/kWh for 20 years	No grant or other support on the capital investment	Installed in any location and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	17.6 GWh (11MWp) per annum	LN 264 of 2015
Residential and non Residential	2 December 2015 to 30 December 2016	15c/kWh for 20 years	No grant or other support on the capital investment	Any installation (excluding structure integrated solar photovoltaic installations)and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	28.8 GWh (18MWp) per annum	LN 415 of 2015 & extended by LN237 of 2016 & extended by LN 346 of 2016

Sector	Period of approval of FIT	Feed-in tariff -FIT	Other support (if any)	Other conditions (If applicable)	Maximum payment of FIT	Cap on total units/annum for payment of the FIT	Legislation
Residential and non Residential	2 November 2015 to 30 June 2016	15c/kWh for 20 years	No grant or other support on the capital investment	Structure integrated solar photovoltaic installations and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	6.4GWh (4MWp) per annum	LN 365 of 2015
Residential	13 July 2015 to 30 December 2016	16.5c/kWh for 6 years	FIT applicable only where the applicant benefits from a grant	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	LN 237 of 2016
Residential and non Residential	1 February 2017 to 30 June 2017	15c/kWh for 20 years	No grant or other support on the capital investment	Installed in any location and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	8.0 GWh (5MWp) per annum extended by a further 4.8GWh (3MWp) for a total of 12.8GWh (8MWp)	LN 32 of 2017 extended by LN 104 of 2017
Residential	3 July 2017 to 31 December 2018	16.5c/kWh for 6 years	FIT applicable only where the applicant benefits from a grant	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	**LN 200 of 2017**
Residential and non Residential	3 July 2017 to 31 December 2018	15.5c/kWh for 20 years	No grant or other support on the capital investment	Installed in any location and >=1kWp and < 40 kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	13.12GWh (8.2MWp) per annum	**LN 200 of 2017 extended by LN 381 of 2017 extended by LN 160 of 2018**
Residential and non Residential	3 July 2017 to 31 December 2018	14c5/kWh for 20 years	No grant or other support on the capital investment	Installed in any location and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	12.8 GWh (8MWp) per annum extended by a further 16GWh (10MWp) for a total of 28.8GWh (18MWp) and further extended to 84.8GWh (53MWp)	**LN 200 of 2017 LN 338 of 2017 extended by LN 381 of 2017 extended by LN 149 of 2018**
Residential and non Residential	2 January 2019 to 30 December 2019	15.5c/kWh for 20 years	No grant or other support on the capital investment	Installed in any location and >=1kWp and < 40 kWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	12.8GWh (8MWp) per annum	**LN 2 of 2019**
Residential and non Residential	2 January 2019 to 30 December 2019	14c5/kWh for 20 years for new approved applications received till 30 Nov 2018; 14c/kWh for 20 years for application recieved after the 30 Nov 2018	No grant or other support on the capital investment	Installed in any location and >=40kWp and <1MWp	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	40 GWh (25MWp) per annum	**LN 2 of 2019**

Sector	Period of approval of FIT	Feed-in tariff -FIT	Other support (if any)	Other conditions (If applicable)	Maximum payment of FIT	Cap on total units/annum for payment of the FIT	Legislation
Residential	2 January 2019 to 30 December 2019	16.5c/kWh for 6 years	FIT applicable only where the applicant benefits from a grant	Grant on investment not exceeding 50%	FIT payment per annum on units not exceeding kWp installed x 1600 and no other caps	None	**LN 2 of 2019**

Notes: (1) PV systems that do not benefit from any of the feed-in tariffs above and installed mainly for own consumption may be paid the marginal cost for any surplus exported to the grid (Regulation 4A-LN 416 of 2014 & LN 171 of 2015)
(2) LN means Legal Notice

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Utility Regulation and Competition Office

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Appendix 3 – OfReg FITs Calculation Methodology

FEED-IN TARIFF (FIT) CALCULATION METHODOLOGY – CORE RATES

The E&U team considered decisions made in other jurisdictions (Australia, Bermuda, Malta, and Tasmania) and the specific circumstances in the Cayman Islands in determining the proposed Customer-Owned Renewable Energy (CORE) rate of KYD$0.134/kWh.

The initial CORE feed-in-tariff set by the former Electricity Regulatory Authority (ERA) did not reflect any specific overarching goals or specific economic analysis. However, The ERA used a 10% IRR as a reasonable return for the investor to invest in CORE. The 10% was based on the system prices at the time. Essentially, it was intended as a 'price discovery' mechanism. The initial tariff intent was to test the market and incentivise early adopters and it was very successful in achieving this.

A global overview of FIT policies shows that a variety of approaches are used, which reflects diversity in the policy goals. These diverse approaches can be split into four basic categories.

1) **Based on the actual levelised cost of renewable energy generation**. This approach is the most commonly used in the EU, and has been the most successful at driving RE development globally (Klein et al. 2008, REN21 2009).

2) **Based on the "value" of renewable energy generation** either to society, or to the utility, generally expressed in terms of "avoided costs." This approach is used in California, as well as in British Columbia (CPUC 2008a, DSIRE 2009b, BC Hydro 2008).

3) **Offered as a fixed-price incentive** without regard to levelised RE generation costs or avoided costs. This approach is used by certain utilities in the U.S. (Couture and Cory 2009).

4) **Based on the results of an auction or bidding process**, which can help advise price discovery by appealing to the market directly. An auction-based mechanism can be applied and differentiated based on different technologies, project sizes, etc., and is a variation on the cost-based approach.

The basis in deciding a fair and reasonable feed-in-tariff is consideration of what is fair to all consumers of electricity.

Independent regulatory bodies in most states have determined a 'fair and reasonable' feed-in tariff for solar energy exported to the grid. This is meant to reflect the average price a household would receive if they were to sell their solar energy on the wholesale market, but also set so that retail electricity prices do not increase for other consumers.

Forcing suppliers to pay a fixed export tariff that yields greater costs to them than benefits (as the 24c/kWh may have done), could lead to perverse incentives and create distortions in the market. Imposing an export tariff greater than the value of exports would result in suppliers bearing disproportionate costs of participating in the FIT scheme since the export tariff will not be allowed into the levelisation process. This would also risk electricity consumers bearing disproportionate costs when the aim is for costs to be spread evenly.

It should be noted that as rates of return are increased, costs to consumers will increase both due the fact that the associated higher tariffs yield higher uptake levels, but also because those

generators who were already willing to invest at lower rates of return are now provided with excess rates (reducing the cost-effectiveness of the scheme).

1) Impact on Bills

Continuing a subsidy framework for small-scale low carbon electricity generation via a FITs policy will incur resource costs to the economy. Net subsidy costs will also be incurred. Electricity consumers are expected to bear the subsidy costs given that FITs payments are to be paid by energy suppliers, who are then expected to pass these costs on to consumers via increased electricity bills.

2) Impact on Grid Stability and Reliability

Intermittent technologies (e.g. wind, solar PV) increase the complexity and risk involved in balancing the grid, avoiding power outages and forced curtailment. Storage capacity (and cost) is needed to increase the uptake of intermittent RE and these are above and beyond the cost of any subsidized FIT rate. And/or demand side flexibility will be required to manage short-term fluctuations in the supply-demand balance. There will be associated additional costs to mitigate these fluctuations.

Where grid resilience is concerned, a greater number of smaller electricity generating installations distributed around the country should increase the grid's ability to withstand major interruptions. However, with the Cayman Islands small land mass this is quickly obviated with island-wide cloud coverage especially during inclement weather conditions.

3) Transmission and Distribution (T&D) Losses

Small-scale generation incentivised by FITs will be, in nearly all cases, nearer to sources of electricity demand than the large sources of generation that it will displace. This will reduce transmission and distribution losses which occur when electricity is transmitted from power stations to centres of demand. The degree to which this has an impact will rely on where FITs installations are located relative to sources of demand and grid infrastructure. Theoretically, transmission costs can be avoided via the purchase of excess electricity produced by solar PV systems as less electricity is produced by other generation sources and therefore less electricity is transmitted via the T&D system to customers.

However, regulators in other jurisdictions have considered that these costs are not avoidable and therefore should not be taken into account in calculating the FIT rate paid to solar PV systems owners.

OfReg consulted with Caribbean Utilities Company Ltd., (CUC) to verify their rate structure and whether its transmission and distribution (T&D) costs cost be avoided. Based on these discussions and akin to other jurisdictions, OfReg understands that the transmission charges are based on the amount of metered consumption at a customer's premises. This means that T&D charges are levied on customers regardless of where energy is obtained, be it from CUC's diesel

generation or from a neighbouring rooftop solar PV system. Additionally, these T&D charges are directly passed on to other customers. Therefore, CUC cannot derive a financial benefit from avoided transmission changes arising from the purchase of excess solar electricity exported to the grid by solar PV customers.

4) Engagement

An important benefit of small-scale solar PV systems installations incentivised by the FITs will be increased public engagement with renewable energy (RE) generation and behavioural change with regard to energy use. This benefit has not been quantified.

Currently, the National Energy Policy (NEP) requires that the FIT will, at most, allow only compensation arising from the following sources. The NEP states inter alia in Section 3.3.1.11:
"Promote grid-connected consumer owned renewable energy programmes in Grand Cayman, Cayman Brac and Little Cayman in a framework which provides:

(a) Rates reflective of the full costs and benefits of distributed renewable energy including economic, social and environmental costs and benefits.
(b) An appropriate billing mechanism.
(c) A simple and safe interconnection arrangement through a standard agreement and for a reasonable term.
(d) Reasonable limits to the individual and overall eligible systems having regard to economic and technical considerations that may evolve over time.
(e) The ability to review and reset programmes appropriately, having regard to technology advances, system capacity considerations and other economic and technical factors."

This requires that the FIT for distributed generation systems reflect the system-wide costs and benefits of this technology and periodic rate adjustments per (e).

The FIT is therefore based on the avoided cost of generation (which is precisely the LCOE of portfolio 5 which includes all generation costs (capacity, fuel, RE, additional storage, etc.), and economic benefits and such other benefits that may from time to time be established by the NEP and/or the relevant guidance from the government.

1) **Avoided cost of generation**. This is the cost of generation that the Transmission & Distribution ("T&D") Licensee avoids by purchasing power from distributed generation.

2) **Economic benefits**. Economic benefits associated with distributed generation.

5) Avoided cost of generation

Firstly, the following categories are directly applicable in assessing the net avoided cost of generation which would comprise a benefit from the installation of distributed generation of renewable energy.

(a) **Reduction in fuel costs and other variable operating costs of generation**. Distributed generation (DG) of RE may allow the evasion of some variable operating costs of overall

system generation that would otherwise be encountered. For example, since DGs supply RE to the network, the T&D Licensee can then produce and/or buy less energy from a conventional bulk generation licensee. In Cayman's case the former applies. Consequently, CUC reduces its fuel costs and other variable operating costs. The decrease in fuel costs and other variable costs does not have to be estimated based on the costs of conventional bulk generators currently connected to the network. For example, where data is available, it would be apt to consider the reduction in costs that would accrue in a projected least-cost scenario within an integrated resource planning ("IRP") process. This is what the Office has done in considering Portfolio 5 of the IRP.

(b) **Reduction in further generation capacity requirements.** DG may lessen the need for additional investment in traditional bulk generation capacity. For example, if, according to the IRP, the existing bulk generation licensees' capacity is not sufficient to meet total demand, or is not able to maintain the required level of system reliability, a significant amount of DG capacity could avoid some additional fixed costs of installing further traditional bulk generation capacity. However, this situation does not obtain in Cayman.

(c) **Reduction in the T&D Licensee's network losses.** Where there is a high correlation between a customer's demand and on-site generation, the energy losses associated with transmission and distribution may decrease with connecting distributed generators to the network.

Additionally, the following categories are indirectly applicable in estimating the net avoided cost of generation, resulting from the deployment of DG of RE:

(a) **Increase in the network costs of the T&D Licensee.** Integration of DG facilities to the existing grid may increase the T&D licensee's network costs associated with providing the required connection assets, network reinforcements and metering services.
(b) **Increase in the cost of system balancing and associated services.** For example frequency response and operating reserves, especially arising from intermittent DG such as solar photovoltaic ("solar PV") generation. Introducing DG to an electricity system can be expected to increase the amount of dispatchable generation capacity that must be held in reserve, to cope with short-term fluctuations in electricity output due to variable solar or wind conditions.
(c) **Increase in the cost of economic stranding of existing generation or network assets.** Significant DG capacity may displace some capacity of bulk generation licensee(s) or lead to under-utilisation of network assets. This could entail a system cost in the form of economic stranding of existing generation and network assets.
(d) **Changes in thermal plant efficiency.** Adding variable DG to a grid can cause a reduction in the conversion efficiency of thermal plants, due to (among other things) more frequent changes in the output of load-following plant assets, greater use of more flexible but potentially less efficient plants, more frequent plant 'start-up' and 'shutdown' measures, and the general efficiency design of the plants.

6) Economic benefits

There are a number of economic benefits and costs that could produce wider government policy objectives.
The size of such benefits would depend on the appropriate guidance from the government and can include the following:

(a) Reduction in costs associated with meeting environmental standards. DG of RE is likely to provide environmental benefits relative to existing and planned traditional generation.

An increase of DG of RE would thus assist in achieving the Cayman Islands Government's (CIG's) environmental objectives. Since CUC (the T&D Licensee) is subject to explicit environmental performance targets, the environmental benefits of DG may be measured as the reduction in the cost to CUC of meeting its environmental performance targets. Absent any explicit environmental performance targets or incentive schemes, environmental benefits can be estimated using metrics e.g. traded carbon prices to value the decrease in carbon emissions. The addition of such benefits in the determination of the level of the FIT should be guided by government policy. However, there is no official CIG Climate Action Policy and OfReg is unaware of any carbon trading initiatives being conducted by CIG.

(b) Increased economic activity. The distribution of the benefits from increased economic activity (such as gross value added from direct employment or taxes generated from economic activity in relation to the installation of solar PV in the Cayman Islands) should also be subject to guidance from the government. Based on government policy, the value impact of the increase in distributed generation on wider economic activity may be reflected in the FIT. Including the benefit from increased economic activity in the calculation of the FIT would shift the incidence value of these benefits from the wider economy to the distributed generators.

7) Calculation of the FIT in Other Jurisdictions

1) **Calculation of the FIT based on avoided costs and economic benefits (RA Bermuda)**

The FIT shall be calculated as the sum of the avoided cost of generation and any net economic and/or other benefits, divided by forecast system total kWh produced by distributed generators. It will be important to consider avoided cost of generation, net economic benefits and production over the same period (the "Period"), e.g. on an annual basis. As a formula, the FIT is calculated as follows:

$$\text{FIT(\$/kWh)} = \frac{\text{avoided cost of generation (\$/Period)} + \text{economic and/or other benefits (\$/Period)}}{\text{forecast system production by distributed generators (kWh/Period)}}$$

The RA noted that there are general limitations to the calculation of individual components of net avoided cost of generation and net economic benefits. Particularly, cost categories may overlap. For example, an increased system reserve requirement for short-term balancing may interact with the required capacity margin needed to meet peak demand. Therefore, it is important to ensure that the avoided system costs and other net economic benefits are not double counted.

2) Calculation of a 'fair and reasonable' FIT in Australia and Tasmania is based on:

- wholesale electricity costs
- network losses; and
- NEM fees.

Where NEM is the National Electricity Market fees paid by electricity retailers.

Based on the foregoing, and in the absence of any CIG information or economists' assessments of the economic and/or other benefits, network losses and no NEM fees (the cost of fuel may be an appropriate substitute for these), and recognising that in the IRP the assumed compensation rate for any surplus power sold back to CUC is based on lower of avoided cost and solar levelised

cost of energy, the Office determined that it was appropriate to calculate the new CORE tariff using the following methodology:

The projected IRP 2020 avoided cost rate $/kWh + an approximated subsidy (which could include economic and/or other benefits)

$0.1168	+	$0.0172	=	$0.134

N.B. The average avoided fuel cost for 2020 has been 10.5 cents to date. So this would more like a 2.9 cent subsidy. The average avoided cost of the IRP in exhibit 59 over the 2021-2045 period was actually 8.8 cents/kWh so the approximate subsidy in 13.4 cents is more like 4.6 cents/kWh.

Whilst some stakeholders may consider this a simplistic solution, the Office is open to receiving recommendations for a more mathematical equation to assist in deriving a fair and equitable CORE tariff.